

# 5.0 L vs DN Calibration Algorithm Summary



# Outline



- Overview of equations, fitting ranges and estimated BCS uncertainties
- L vs DN charts
  - @4 Instrument Temperature Plateaus
- Band-by-Band Calibration Fitting Summaries
- L1B Algorithm Demonstration
- Short term (4 days) Repeatability Assessment
- Calibration Coefficient Temperature Dependencies
  - With Instrument Temperature (256 K, 273 K, 283 K)
  - With FPA Temperature (77 K, 83 K, 85 K)
- Comparisons of BCS and OBC Blackbody Calibration Coefficients



## Outline - continued



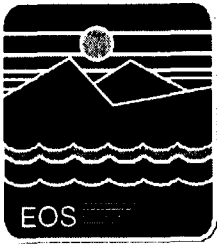
- Comparability Assessments
  - Primary electronics vs Secondary (redundant) electronics
  - Mirror Side A vs Mirror Side B



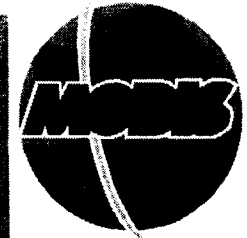
# Background



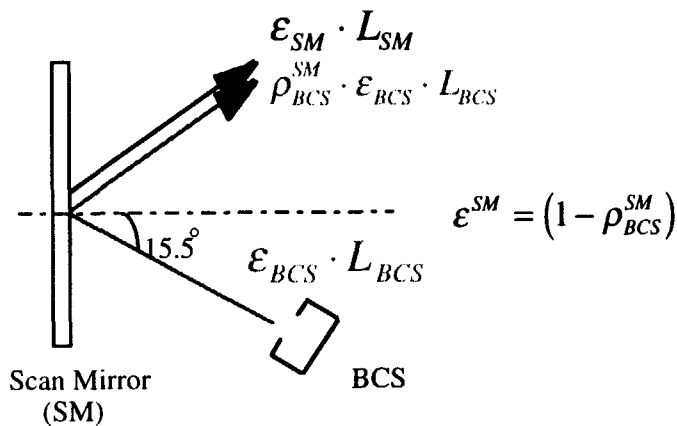
- 1) L vs DN Calibration Equations
- 2) Science Team Fitting Range and Polynomial Order Selections
- 3) Estimated BCS Radiance Uncertainties



# Calibration Equation

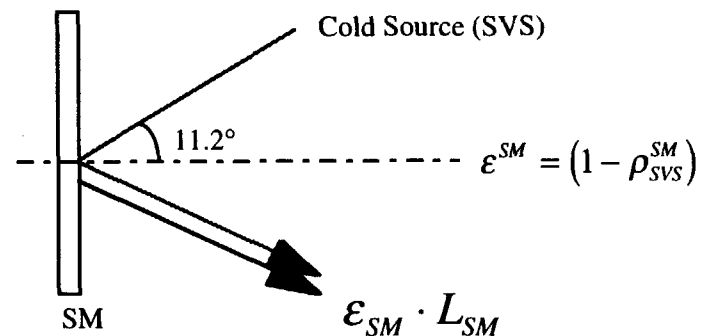


When viewing the Blackbody Calibration Source (BCS)



$$L_{BCS\_path} = \rho_{BCS}^{SM} \cdot \epsilon_{BCS} \cdot L_{BCS} + \epsilon_{SM} \cdot L_{SM} + L_{BKG}$$

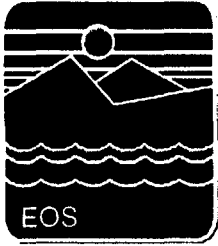
When viewing the Space View Source (SVS)



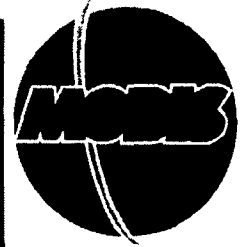
$$L_{SVS\_path} = \epsilon_{SM} \cdot L_{SM} + L_{BKG}$$

Subtracting the Two Views and Equating to a Quadratic Function:

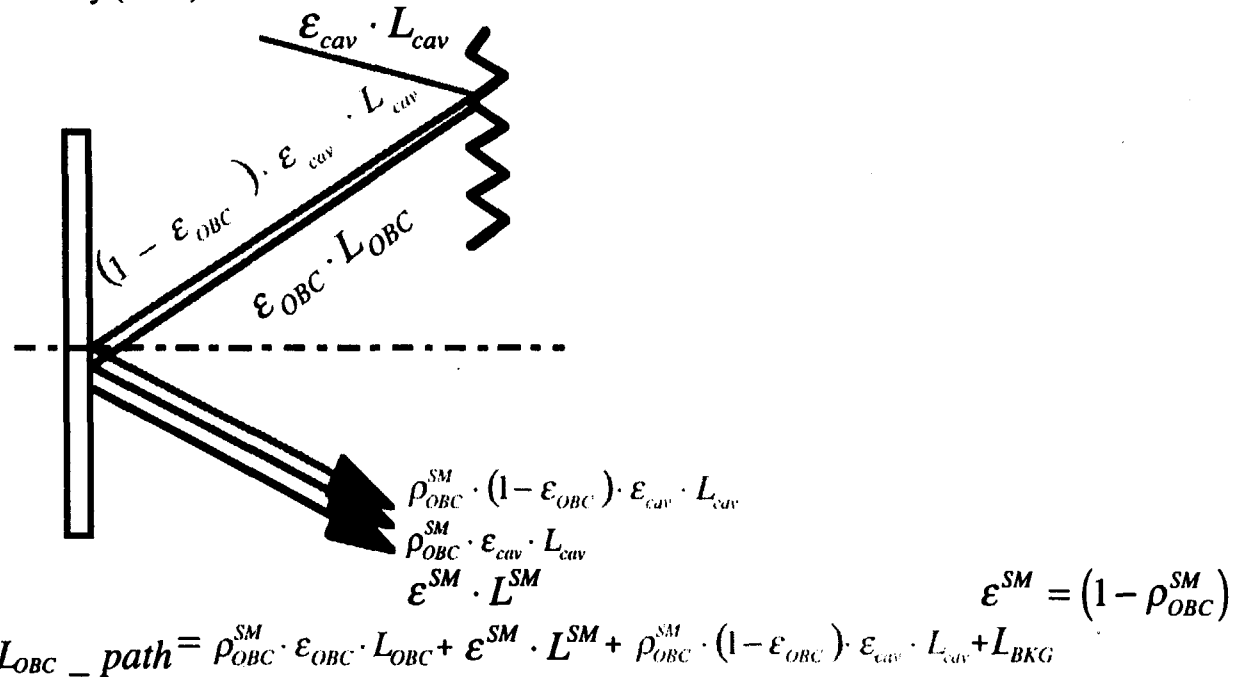
$$\rho_{BCS}^{SM} \cdot \epsilon_{BCS} \cdot L_{BCS} + (\rho_{SVS}^{SM} - \rho_{BCS}^{SM}) L_{SM} = a_0^{BCS} + a_1^{BCS} dn_{BCS} + a_2^{BCS} dn_{BCS}^2$$



# Calibration Equation (Continued)



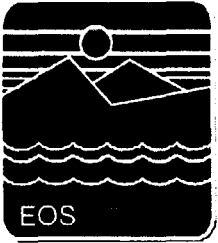
When viewing On-Board Blackbody (OBC)



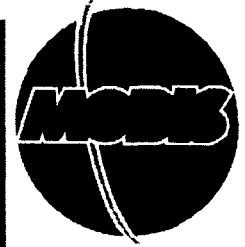
Subtracting the Space View Path

$$\rho_{OBC}^{SM} \cdot \epsilon_{OBC} \cdot L_{OBC} + (\rho_{SVS}^{SM} - \rho_{OBC}^{SM}) \cdot L_{SM} + \rho_{OBC}^{SM} \cdot (1 - \epsilon_{OBC}) \cdot \epsilon_{cav} \cdot L_{cav} = a_0^{BCS} + b_1^{OBC} dn_{OBC} + a_2^{BCS} \cdot dn_{OBC}^2$$

Where  $b_1^{OBC}$ : determined scan-by-scan from OBC Measurements, and overstrike bars indicate averages over Band Spectral response.



# Calibration Equation (Continued)



By Analogy:

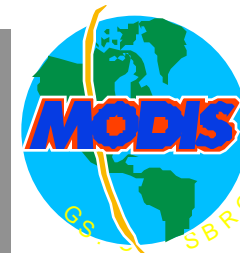
$$\rho_{EV}^{SM} \cdot L_{EV} + (\rho_{SV}^{SM} - \rho_{EV}^{SM}) \cdot L_{SM} = a_0^{BCS} + b_1^{OBC} dn_{EV} + a_2^{BCS} \cdot dn_{EV}^2$$

$$\bar{L}_{EV} = \frac{\int \frac{1}{\rho_{EV}^{SM}} \left[ a_0^{BCS} + b_1^{OBC} dn_{EV} + a_2^{BCS} dn_{EV}^2 - \{ \rho_{SV}^{SM} - \rho_{EV}^{SM} \} \cdot L_{SM} \right] RSR(\lambda) d\lambda}{\int RSR(\lambda) d\lambda}$$

$$\bar{L}_{EV} = L_{EV} \left[ \underbrace{a_0^{BCS}, a_2^{BCS}, \rho_{AOI}^{SM}, \epsilon_{cav}, \epsilon_{OBC}, \Delta T_{OBC}, RSR(x)}_{\text{PreLaunch Coefficients}}, \underbrace{b_1^{OBC}, T_{OBC}, T_{SM}, T_{cav}, DN_{EV}, DN_{OBC}, DN_{SV}}_{\text{On-Orbit Parameters}} \right]$$



# Science Team Requests Regarding Calibration Fitting Ranges



Band Number	CWL meas&corr'd (nm)	Peter Minnett (Note 1) Tmin	Tmax	Zhengming Wan (Note 2) Tmin	Tmax	Moeller/Menzel Tmin	Tmax
20	3788.2	265	305	(220)265	305(325)	(265): Note 3	
21	3992.1						
22	3971.9	265	305	(220)265	305(325)	(264): Note 4	
23	4056.7	265	305	(220)265	305(325)	(264): Note 5	
24	4473.2						
25	4545.4						
27	6765.4						
28	7336.7						
29	8540.7			(220)265	305(325)	220	
30	9730.0						
31	11014.4	265	305	(220)265	305(325)	220	
32	12028.2	265	305	(220)265	305(325)	220	
33	13361.2						
34	13679.5						
35	13910.8						
36	14194.8						

Band Number	CWL meas&corr'd (nm)	Proposed Calibration Temperature Ranges			
		Tcal min	Tcal max		
20	3785.0	253(0.1Ltyp)	240	320	fit to quadratic and cubic; fit to Zhengming's weighting recommendation per time available
		265(0.2Ltyp)	260	320	fit to quadratic and cubic
		All BCS Levels			fit to quadratic and cubic
21	3990.0	260	NA		
22	3970.1	252(0.1Ltyp)	250	324	fit to quadratic and cubic; fit to Zhengming's weighting recommendation per time available
		264(0.2Ltyp)	260	324	fit to quadratic and cubic
23	4056.4	251(0.1Ltyp)	250	325	fit to quadratic and cubic; will fit to Zhengming's weighting recommendation per time available
		264(0.2Ltyp)	260	325	fit to quadratic and cubic
24	4471.7	229(0.3Ltyp)	230	315	
25	4545.2	248(0.3Ltyp)	250	315	
27	6752.4	211(0.3Ltyp)	210	315	
28	7333.8	217(0.3Ltyp)	220	315	
29	8517.9	213(0.1Ltyp)	210	317	fit to Zhengming's weighting recommendation per time available
30	9736.7	208(0.3Ltyp)	210	315	
31	11017.2	220(0.1Ltyp)	220	316	fit to Zhengming's weighting recommendation per time available
32	12032.4	220(0.1Ltyp)	220	315	fit to Zhengming's weighting recommendation per time available
33	13358.8	202(0.3Ltyp)	200	315	
34	13674.5	195(0.3Ltyp)	190	315	
35	13907.0	188(0.3Ltyp)	190	315	
36	14191.5	175(0.3Ltyp)	170	315	

Note: Tcal\_max set to higher of 315K or 0.9Lmax

Note: Arrow to round-off, indicates nearest available BCS temperature level (in most cases); exceptions involve a round-down to pick up additional data.

Note: BCS at 320K will be used for all Tcal\_max's

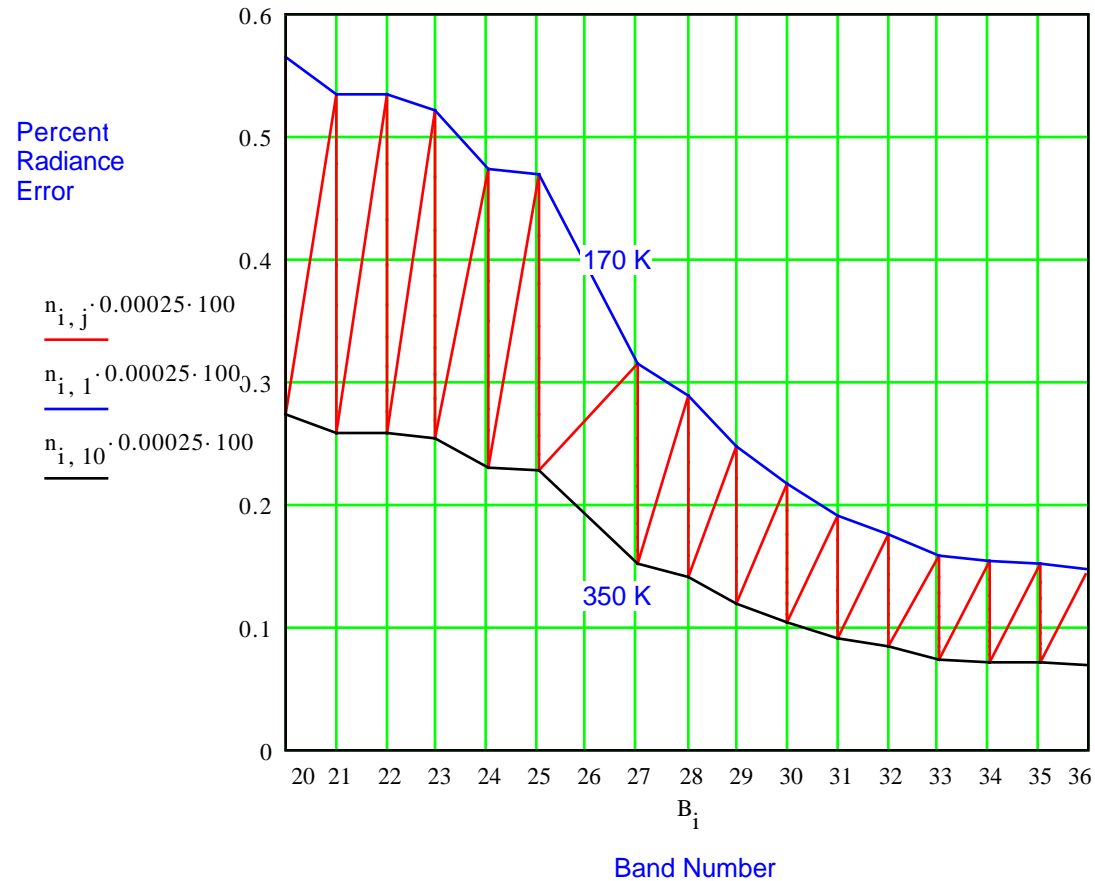


### Radiance to Temperature Conversions

Band Number	CWL meas&corr'd (nm)	Band Center (cm-1)	Ltyp_spec W/(m2*sr*um)	Ltyp W/(m2*sr*cm-1)	0.3*Ltyp W/(m2*sr*um)	0.3*Ltyp W/(m2*sr*cm-1)	0.9*Lmax W/(m2*sr*um)	0.9*Lmax W/(m2*sr*cm-1)	Lmax_spec W/(m2*sr*um)	Lmax W/(m2*sr*cm-1)
20	3788.2	2639.8	0.45	0.00065	0.14	0.00019	1.54	0.00221	1.71	0.00245
21	3992.1	2504.9	2.38	0.00379	0.71	0.00114	77.40	0.12335	86.00	0.13706
22	3971.9	2517.7	0.67	0.00106	0.20	0.00032	1.70	0.00268	1.89	0.00298
23	4056.7	2465.1	0.79	0.00130	0.24	0.00039	1.94	0.00320	2.16	0.00355
24	4473.2	2235.5	0.17	0.00034	0.05	0.00010	0.31	0.00061	0.34	0.00068
25	4545.4	2200.0	0.59	0.00122	0.18	0.00037	0.79	0.00164	0.88	0.00182
27	6765.4	1478.1	1.16	0.00531	0.35	0.00159	2.89	0.01322	3.21	0.01469
28	7336.7	1363.0	2.18	0.01173	0.65	0.00352	4.01	0.02161	4.46	0.02401
29	8540.7	1170.9	9.58	0.06988	2.87	0.02096	13.09	0.09545	14.54	0.10606
30	9730.0	1027.7	3.69	0.03493	1.11	0.01048	5.71	0.05402	6.34	0.06002
31	11014.4	907.9	9.55	0.11586	2.87	0.03476	11.93	0.14467	13.25	0.16074
32	12028.2	831.4	8.94	0.12934	2.68	0.03880	10.89	0.15755	12.10	0.17506
33	13361.2	748.4	4.52	0.08069	1.36	0.02421	5.90	0.10540	6.56	0.11711
34	13679.5	731.0	3.76	0.07036	1.13	0.02111	4.52	0.08455	5.02	0.09394
35	13910.8	718.9	3.11	0.06018	0.93	0.01805	3.98	0.07698	4.42	0.08553
36	14194.8	704.5	2.08	0.04191	0.62	0.01257	2.66	0.05368	2.96	0.05964
c1	374177490									
c2	14387.69									
Band Number	CWL meas&corr'd (nm)	T@0.1*Ltyp	T@0.2*Ltyp	T@0.3*Ltyp	Ttyp	T@0.9*Lmax	Tmax	Tsat		
20	3788.2	252.6	264.8	272.5	298.2	330.1	333.2	333		
21	3992.1	274.9	290.3	300.1	333.5	492.0	499.2	470		
22	3971.9	251.5	264.2	272.3	299.4	324.3	327.4	329		
23	4056.7	251.0	263.9	272.1	299.8	324.5	327.7	329		
24	4473.2	211.9	222.0	228.4	249.8	261.7	264.0	318		
25	4545.4	228.5	240.5	248.1	274.0	281.2	283.8	314		
27	6765.4	190.0	202.6	210.7	239.3	266.6	270.2	323		
28	7336.7	193.1	207.3	216.6	249.7	270.8	274.8	320		
29	8540.7	212.8	233.3	247.1	300.0	317.6	324.0	331		
30	9730.0	180.0	196.5	207.7	249.9	269.7	275.0	365		
31	11014.4	196.5	219.4	235.3	299.9	315.8	323.9	403		
32	12028.2	190.7	214.3	231.0	300.0	315.3	324.0	396		
33	13361.2	167.5	187.7	201.9	260.0	277.6	285.2	337		
34	13679.5	161.9	181.2	194.8	250.0	261.2	268.1	345		
35	13910.8	156.7	175.0	187.9	239.9	254.2	260.8	344		
36	14194.8	146.8	163.2	174.6	219.9	232.3	237.9	378		



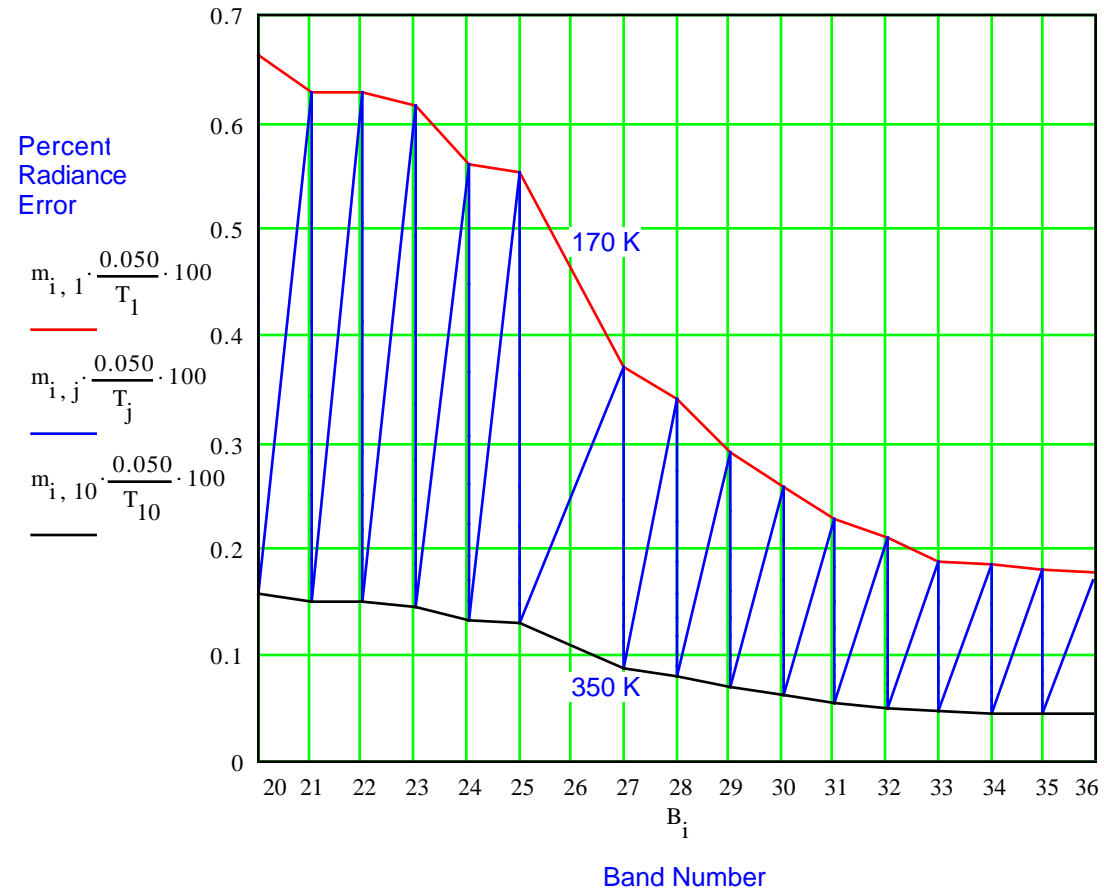
# Radiance Error Due to Uncertainty in Band Center Wavelength Knowledge ( $T=0.0$ ; $\Delta\lambda=0.025\%$ )



The effect of 0.025% error in wavelength knowledge on  $dL/L$  (e.g., about 1 nm for Band 20, and 3.5 nm for Band 35). Saw tooth pattern represents variation of error for temperatures between 170K (tops) and 350 K (bottoms) for each band.



# Radiance Error Due to Uncertainty in BCS Temperature Knowledge ( $T = 50 \text{ mK}$ ; $\sigma = 0.0\%$ )

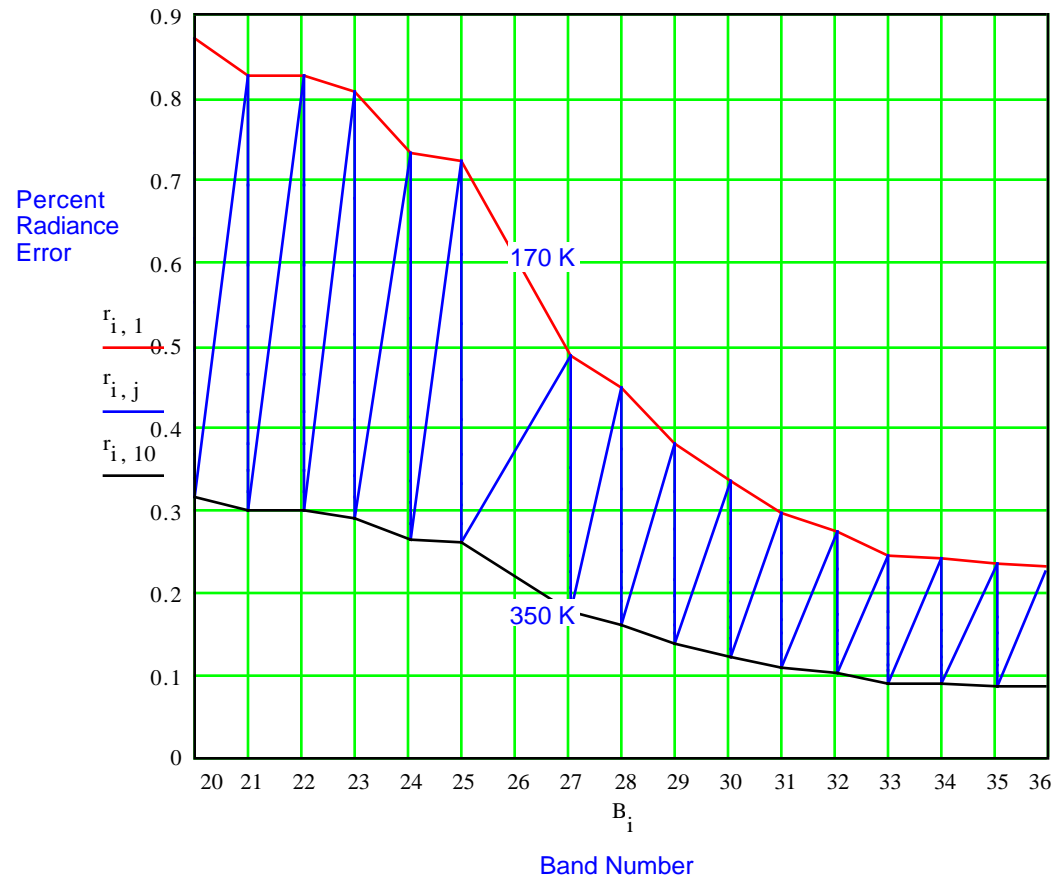


The effect of 50 mK error in temperature knowledge on  $dL/L$ . Saw tooth pattern represents variation of error for temperatures between 170K (tops) and 350K (bottoms) for each band.



# BCS Radiance Error Due to Temperature and Center Wavelength Uncertainties

(  $\Delta T = 50 \text{ mK}$ ;  $\Delta \lambda = 0.025\%$  )



Radiance RSS error due to 50 mK temperature error and 0.025% Band center wavelength error as a function of temperature and Band Number. Saw tooth pattern represents variation of error for temperatures between 170 K (tops) and 350 K (bottoms) for each band.

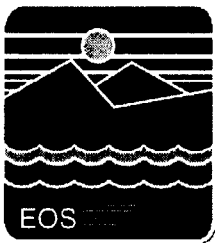
# L vs DN Charts

Cold Plateau (256 K)

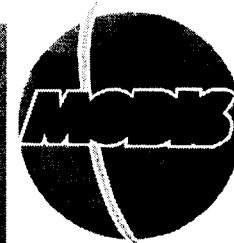
Nominal 1 Plateau (273 K)

Nominal 2 Plateau (273 K)

Hot Plateau (283 K)

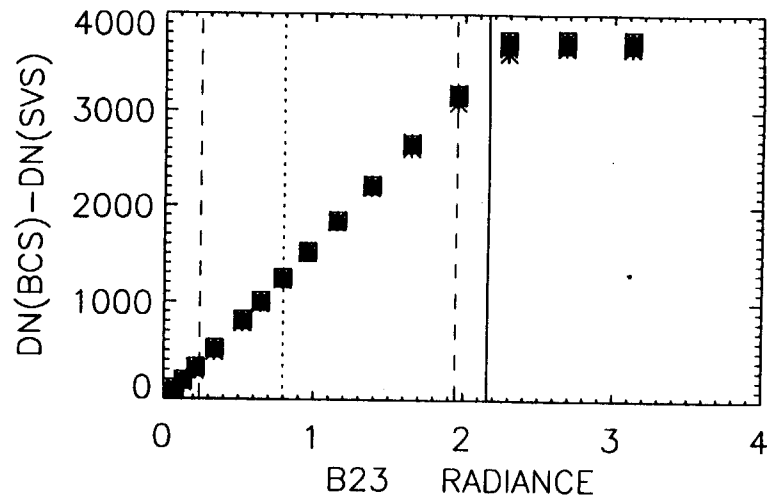
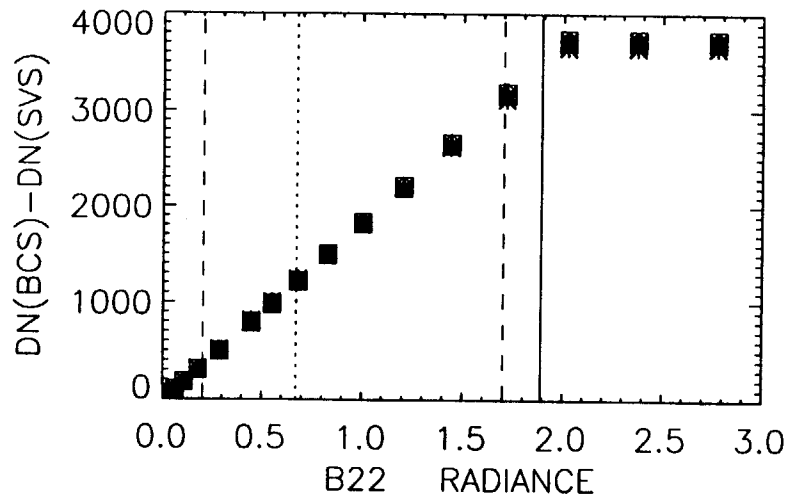
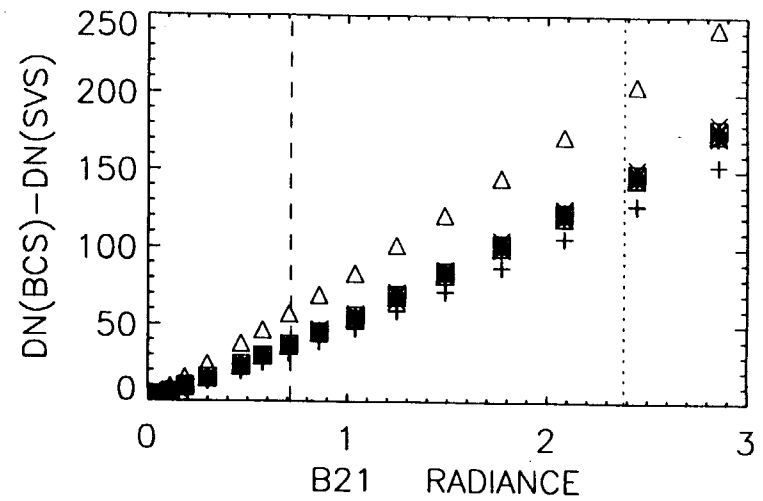
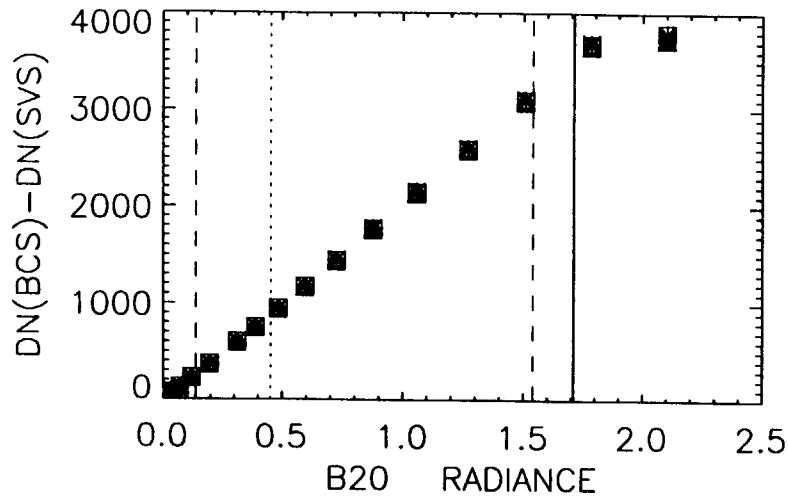


# Emissive Bands Thermal Vacuum Calibration Data Sets (RC02)



	<b>Instrument Temperature</b> (measured near aft-optics S/MWIR Objective Assembly)		
<b>FPA Temp.</b> ↓			
<b>NLT (~77K)</b>		1644-1654 (210K < T <sub>bcs</sub> < 330K)	
<b>83K</b>	1315-1337 (Side A) 1342-1354 (Side B) (A: 170K < T <sub>bcs</sub> < 340K) (B: 210K < T <sub>bcs</sub> < 330K)	1506-1526 (Side A) 1595-1618 (Side B)	1402-1426 (Side A) 1428-1439 (Side B)
<b>85K</b>		1665 (BCS=310K; 2 VDETs) 1666 (BCS=310K; 2 VDETs)	

COLD PLATEAU (256 K); UAID: 1315 - 1337

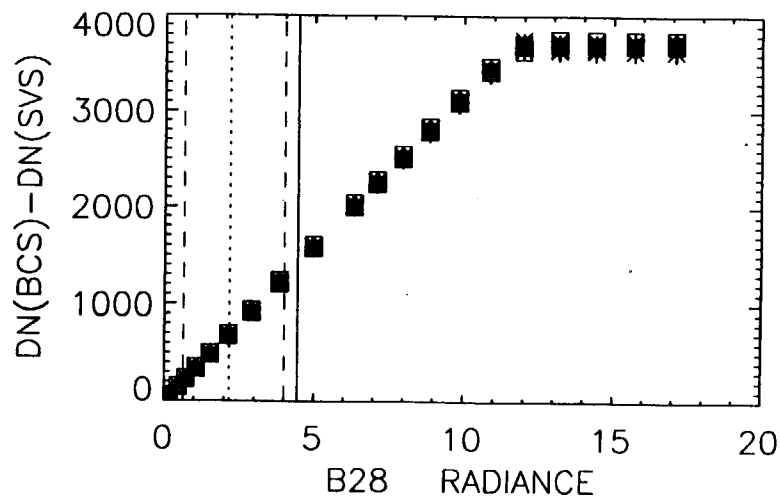
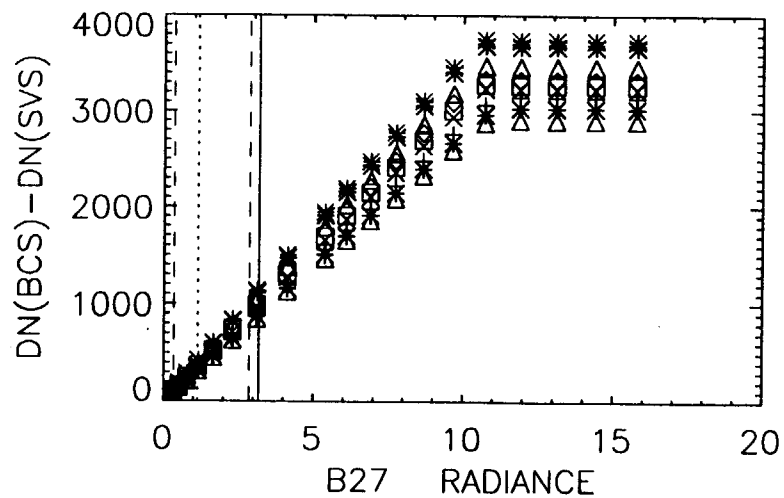
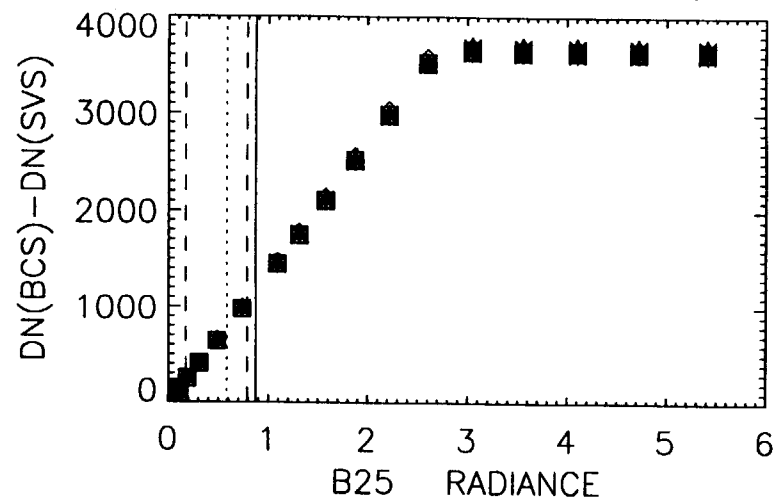
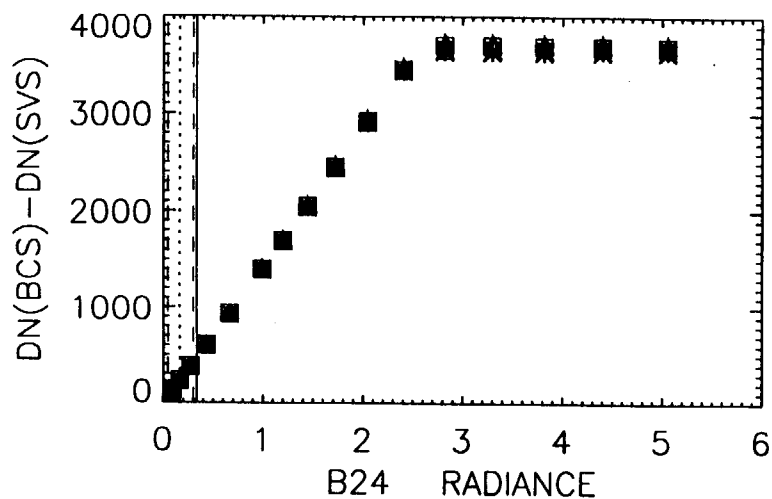


Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ    Ch5: Red ◇  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*    Ch10: Red Δ

Radiance (L) Unit:  $W / (m^2-sr-\mu m)$

Ltyp: Green Dotted Line; Lmax: Red Solid Line; .3Ltyp-0.9Lmax: Dashed Lines

COLD PLATEAU (256 K); UAID: 1315 - 1337



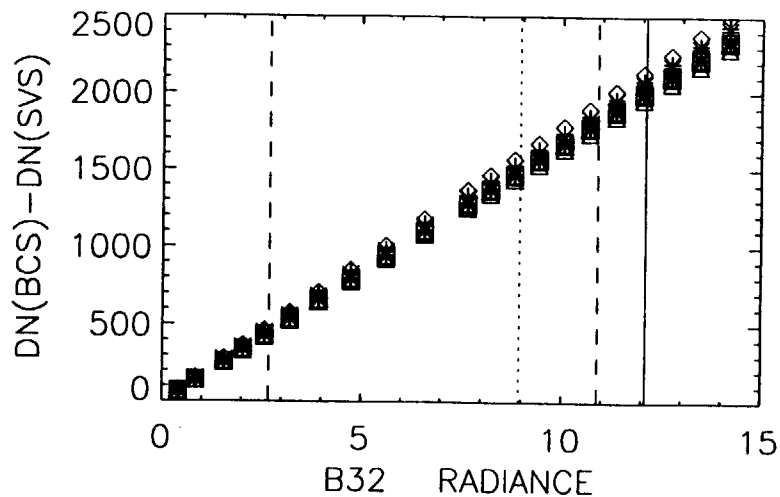
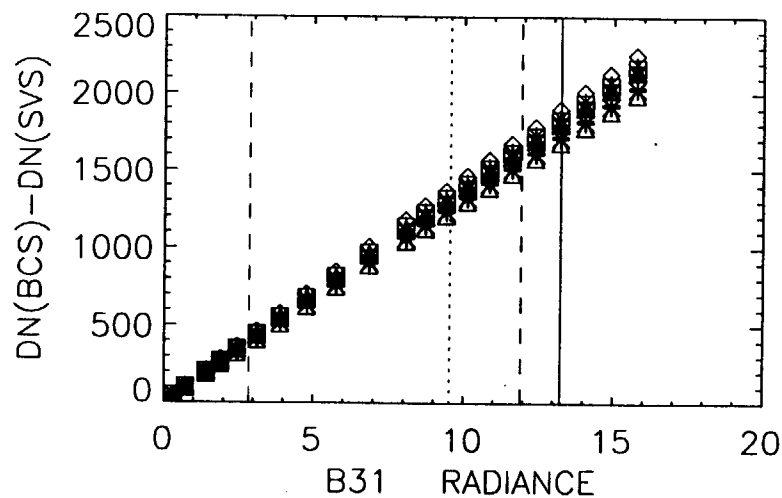
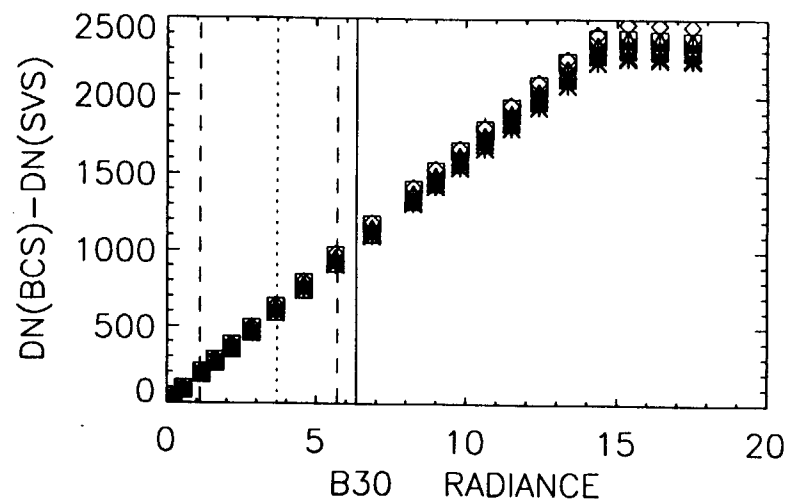
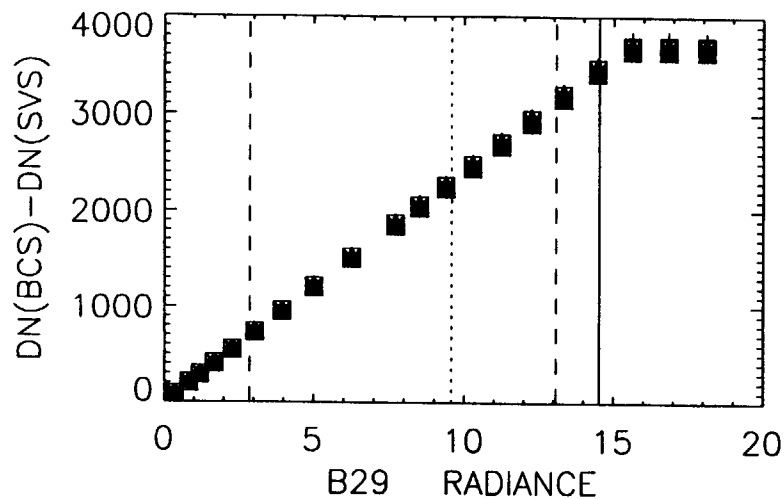
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COLD PLATEAU (256 K); UAID: 1315 - 1337

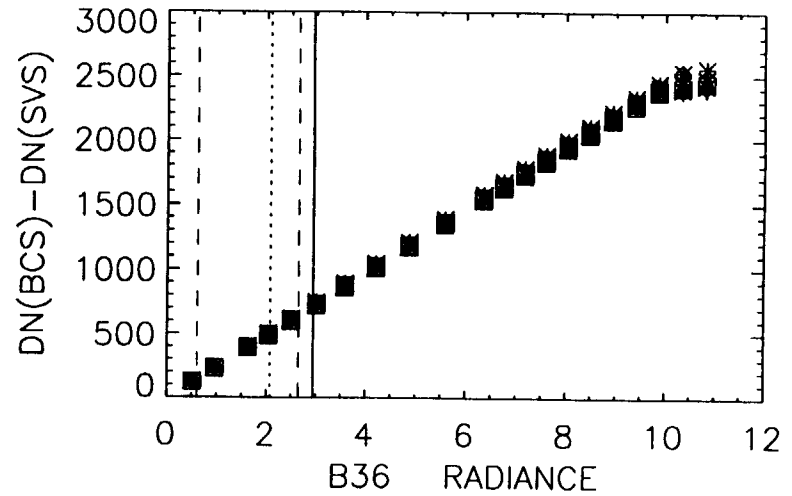
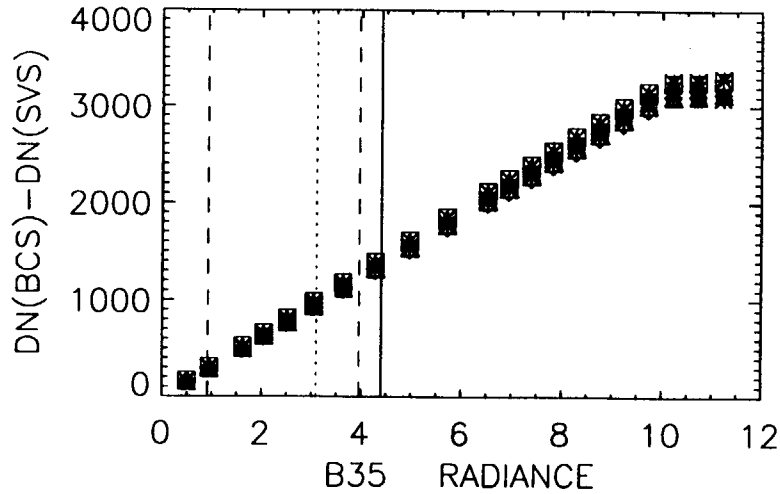
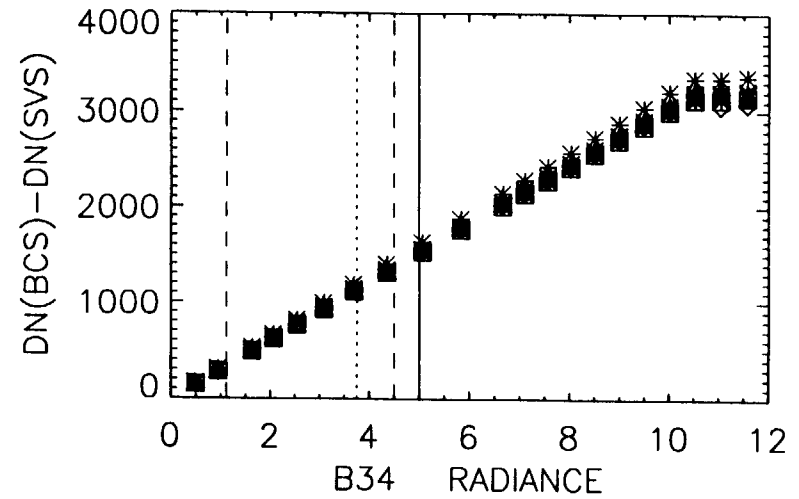
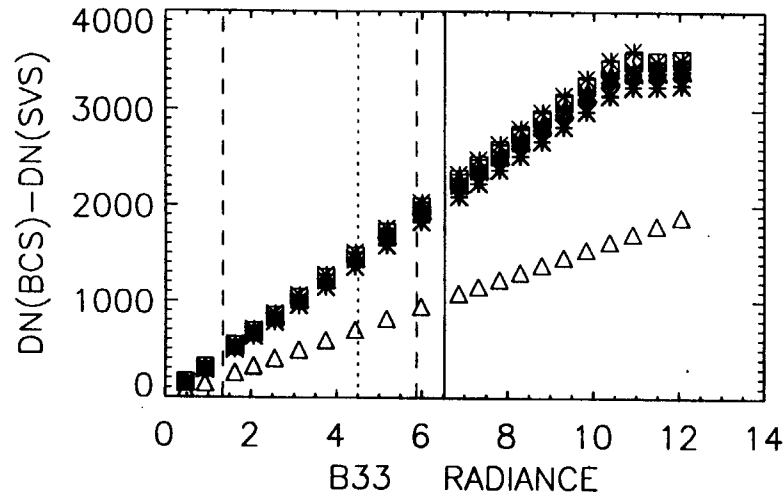


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 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*    Ch10: Red Δ

Radiance (L) Unit:  $W / (m^2-sr-\mu m)$

Ltyp: Green Dotted Line; Lmax: Red Solid Line; .3Ltyp-0.9Lmax: Dashed Lines

COLD PLATEAU (256 K); UAID: 1315 - 1337

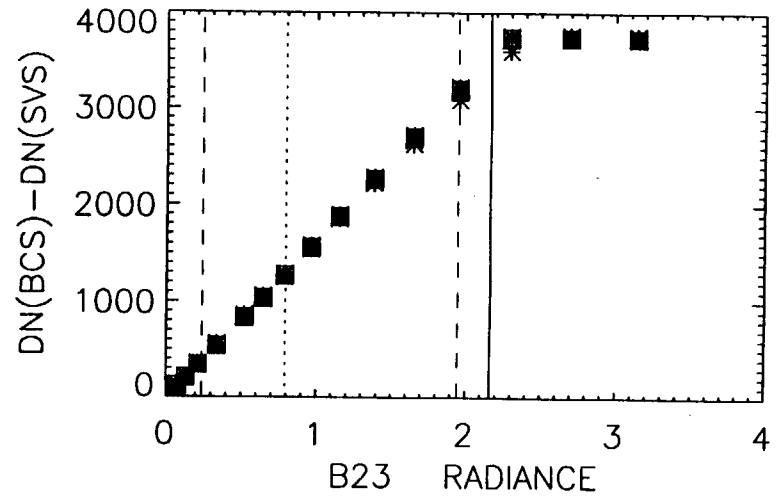
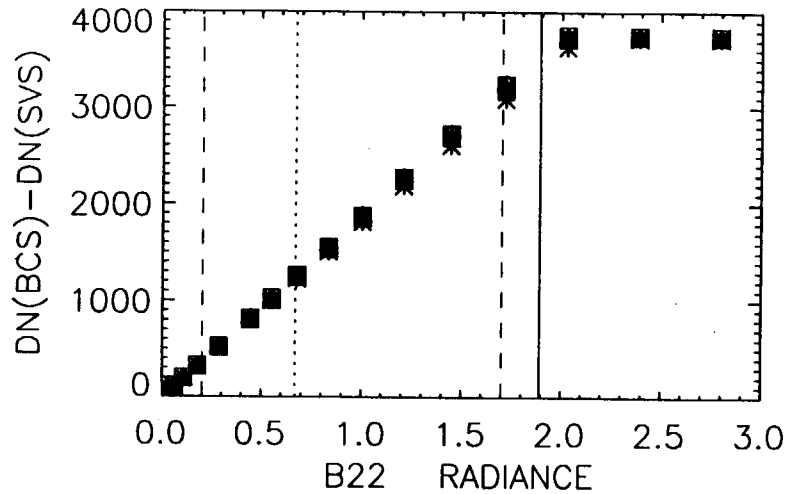
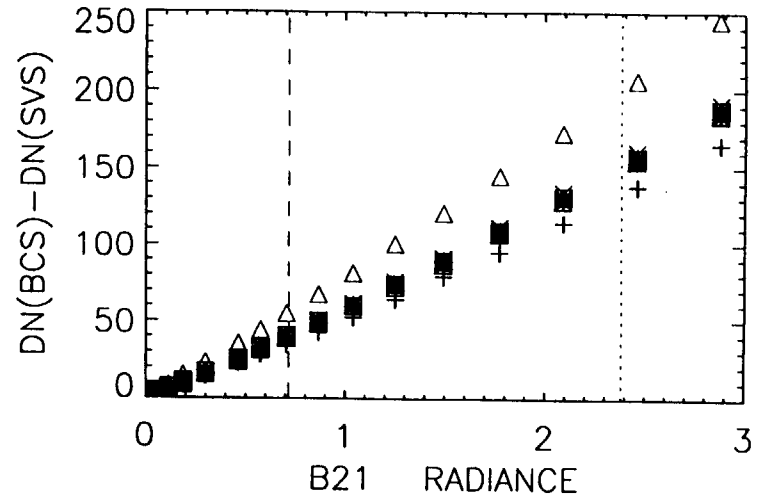
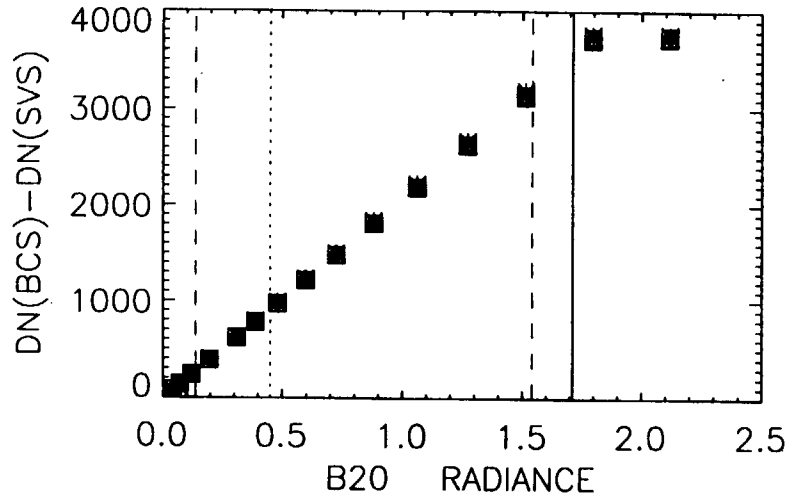


Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ    Ch5: Red ◇  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*    Ch10: Red Δ

Radiance (L) Unit:  $W / (m^2-sr-\mu m)$

Ltyp: Green Dotted Line; Lmax: Red Solid Line; .3Ltyp-0.9Lmax: Dashed Lines

NOMINAL PLATEAU (273 K); UAID: 1506 - 1526

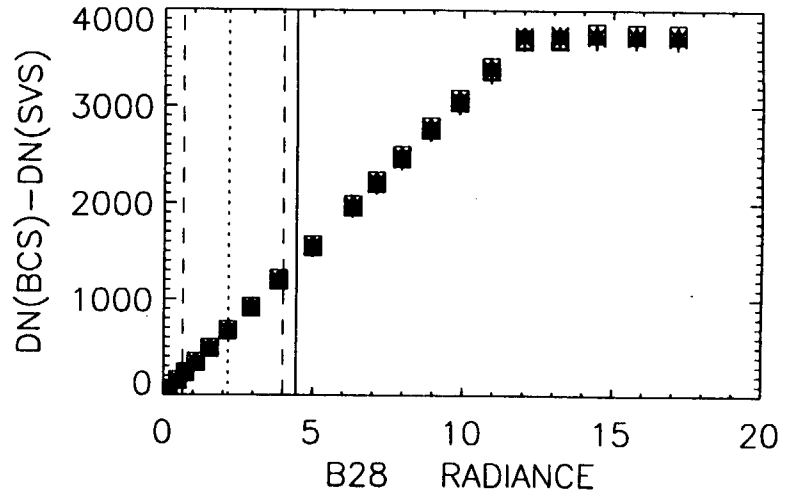
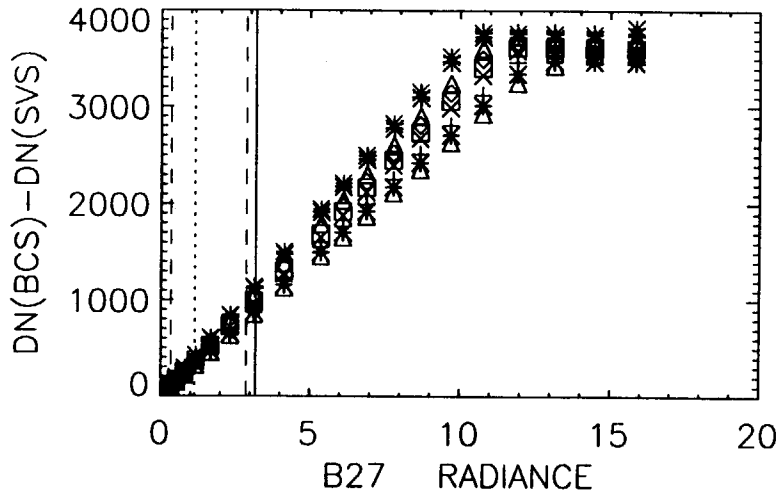
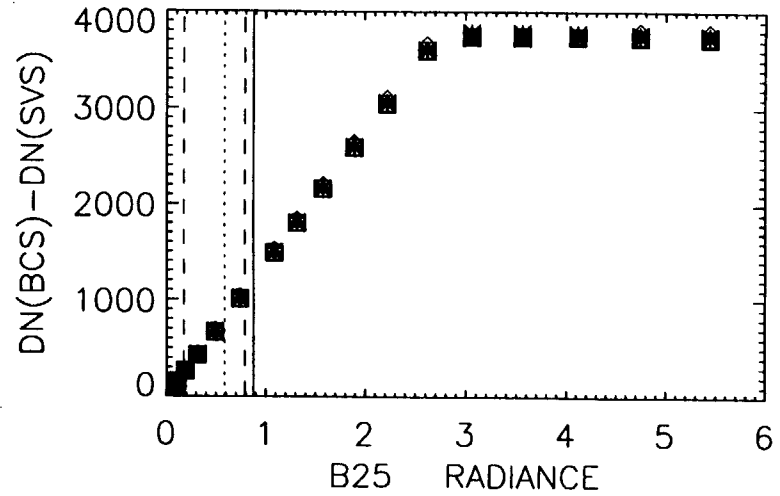
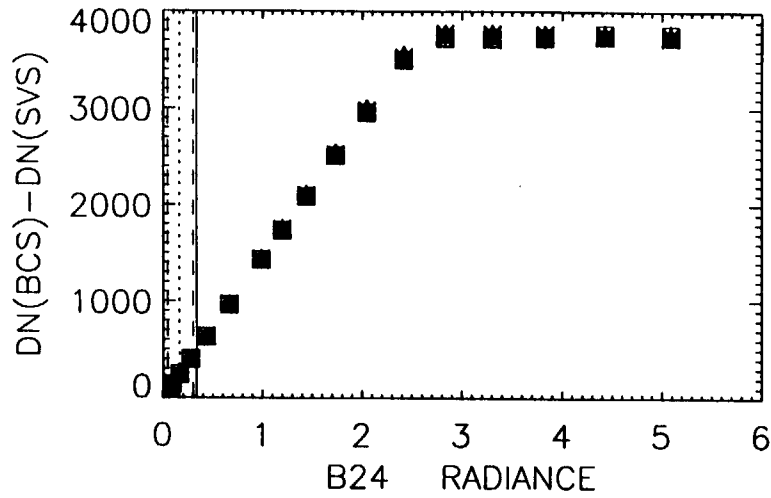


Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ    Ch5: Red ◇  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*    Ch10: Red Δ

Radiance (L) Unit:  $W / (m^2-sr-\mu m)$

Ltyp: Green Dotted Line; Lmax: Red Solid Line; .3Ltyp-0.9Lmax: Dashed Lines

NOMINAL PLATEAU (273 K); UAID: 1506 - 1526

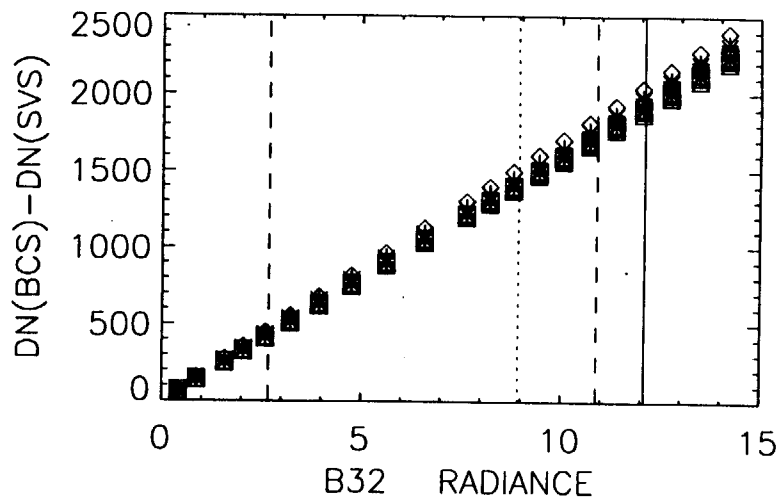
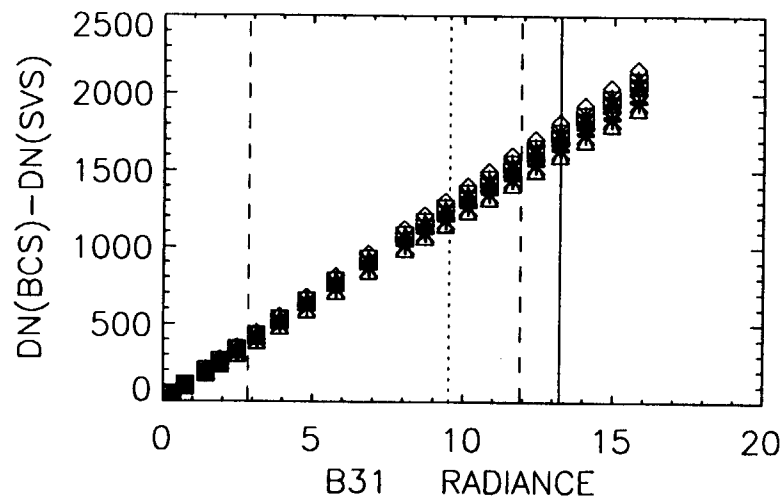
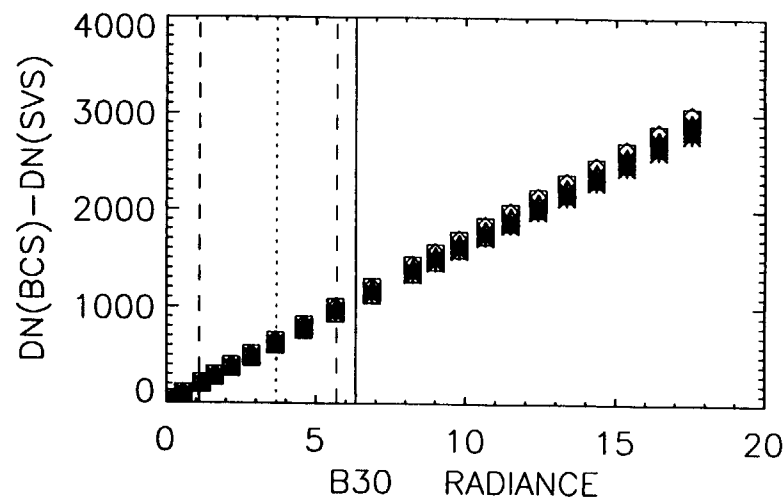
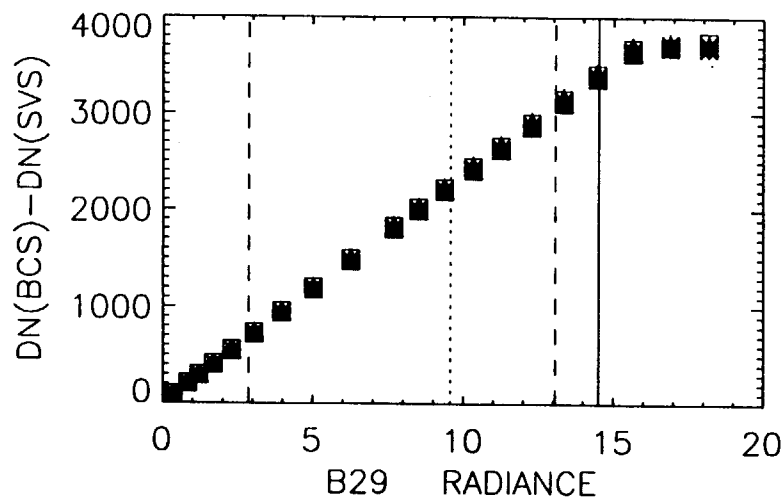


Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ    Ch5: Red ◇  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*    Ch10: Red Δ

Radiance (L) Unit:  $W / (m^2-sr-\mu m)$

Ltyp: Green Dotted Line; Lmax: Red Solid Line; .3Ltyp-0.9Lmax: Dashed Lines

NOMINAL PLATEAU (273 K); UAID: 1506 - 1526

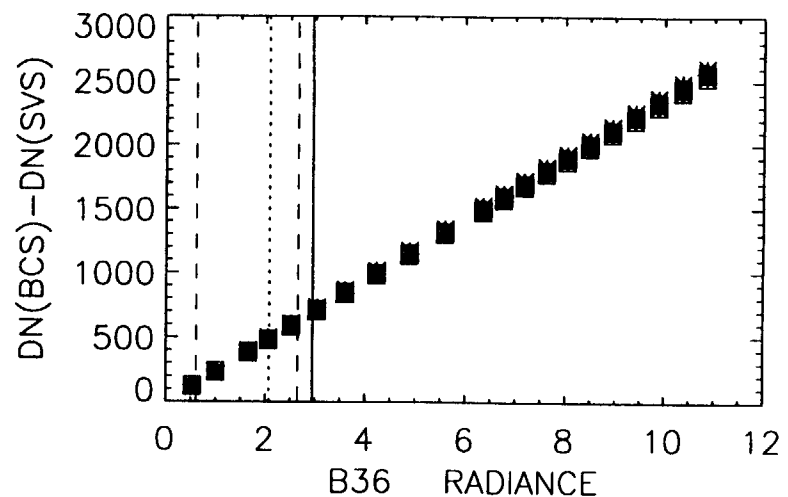
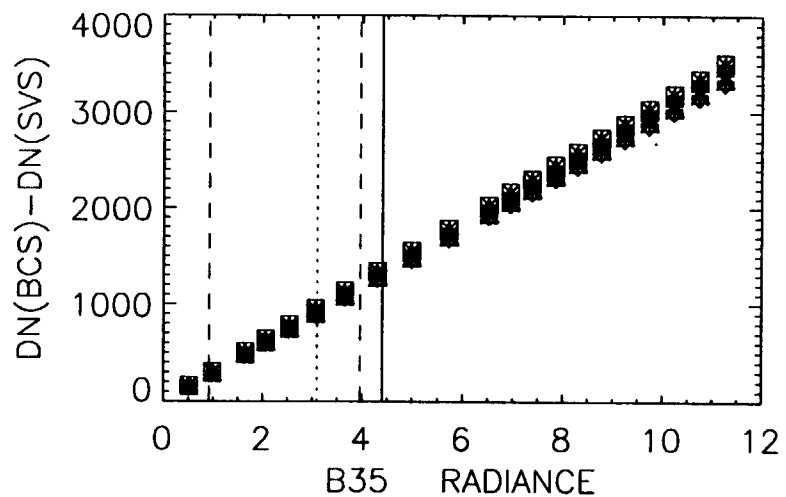
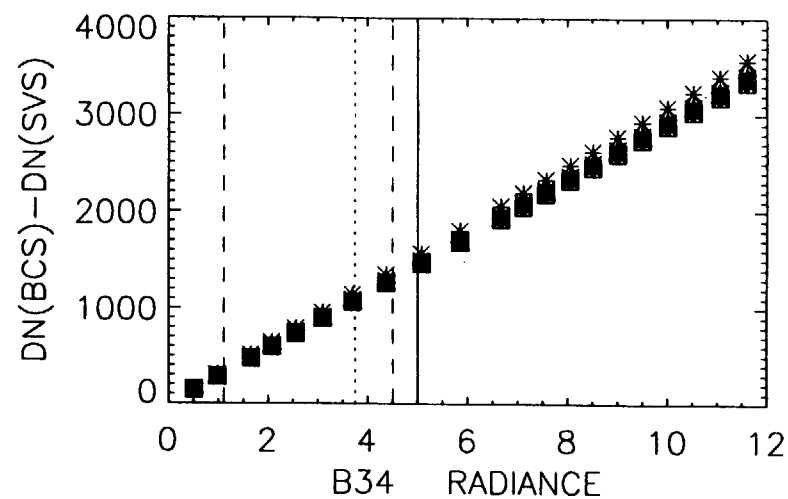
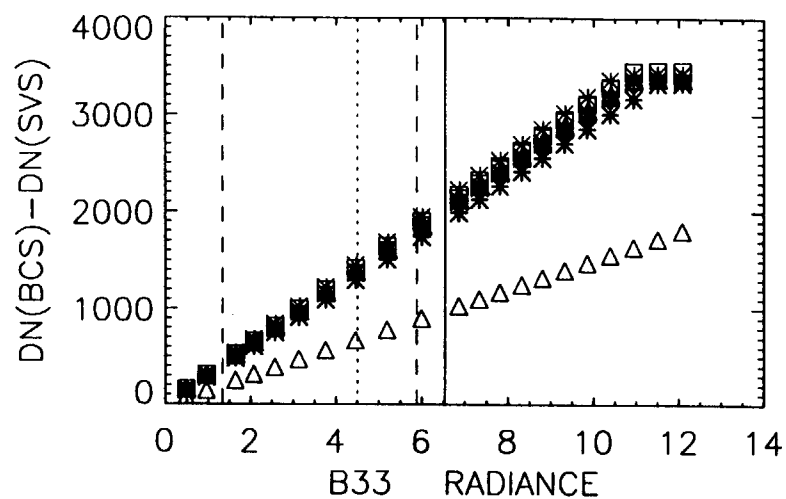


Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ    Ch5: Red ◇  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*    Ch10: Red Δ

Radiance (L) Unit:  $W / (m^2-sr-\mu m)$

Ltyp: Green Dotted Line; Lmax: Red Solid Line; .3Ltyp-0.9Lmax: Dashed Lines

NOMINAL PLATEAU (273 K); UAID: 1506 - 1526

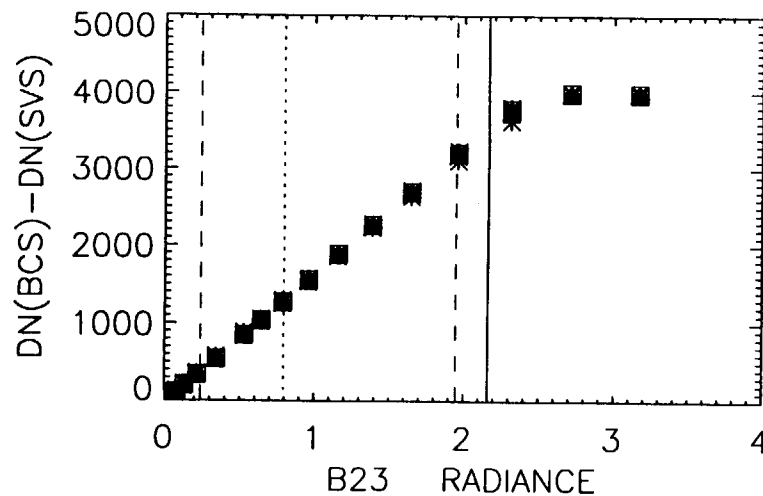
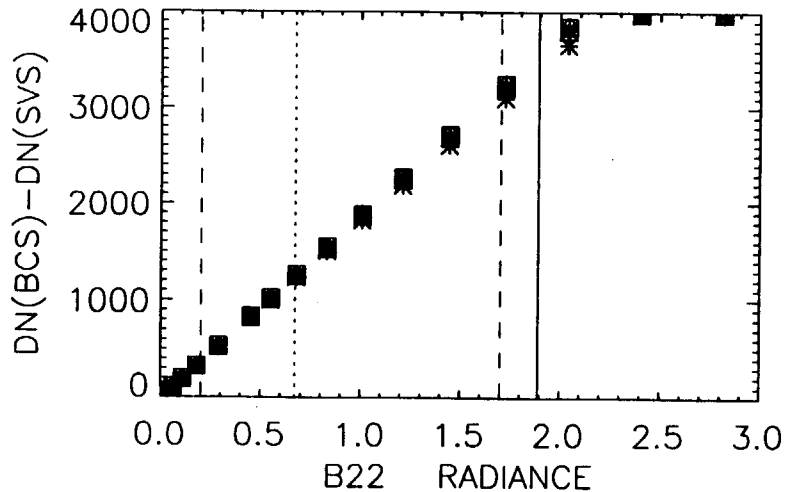
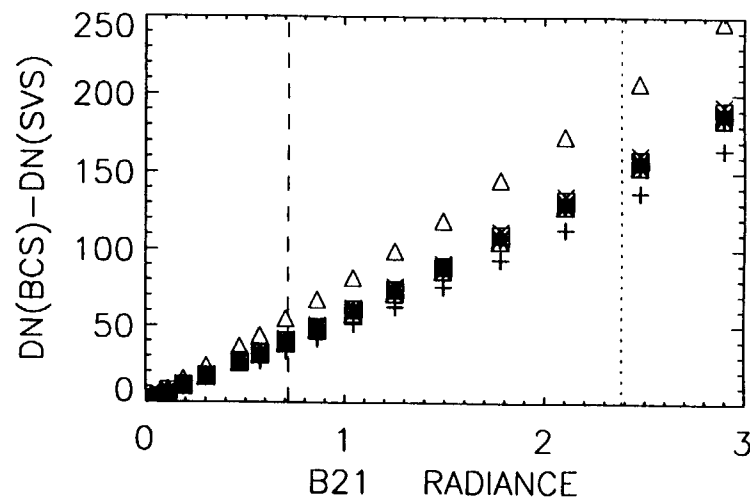
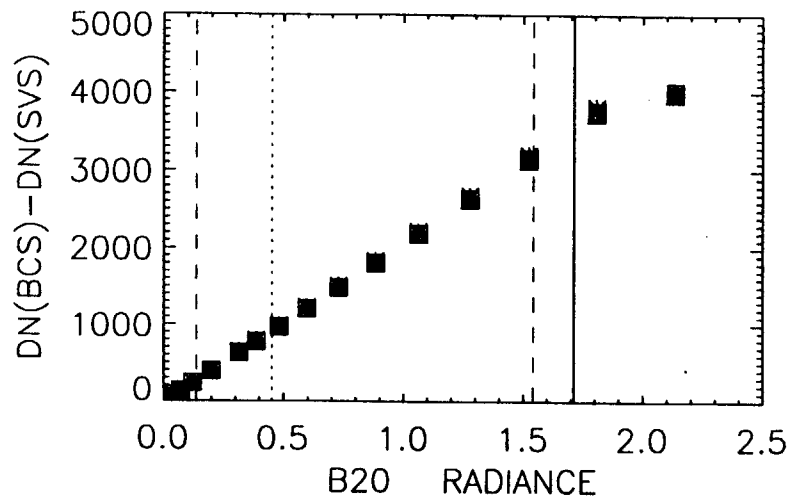


Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ    Ch5: Red ◇  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*    Ch10: Red Δ

Radiance (L) Unit:  $W / (m^2-sr-\mu m)$

Ltyp: Green Dotted Line; Lmax: Red Solid Line; .3Ltyp-0.9Lmax: Dashed Lines

NOMINAL PLATEAU (273 K); UAID: 1595 - 1618

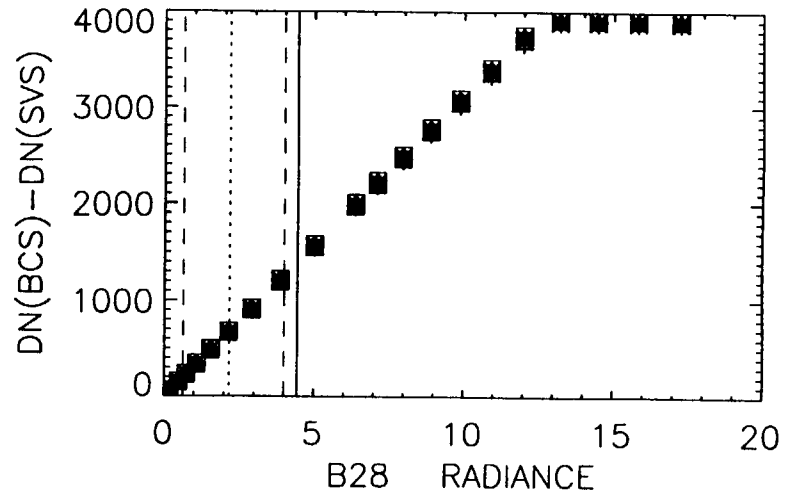
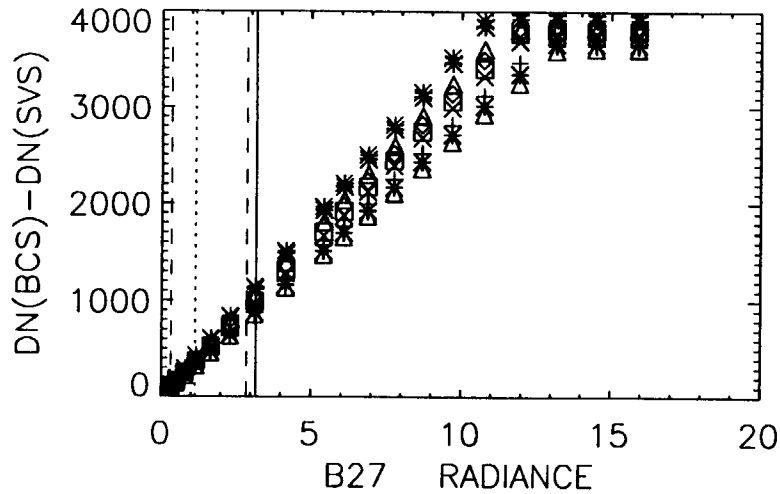
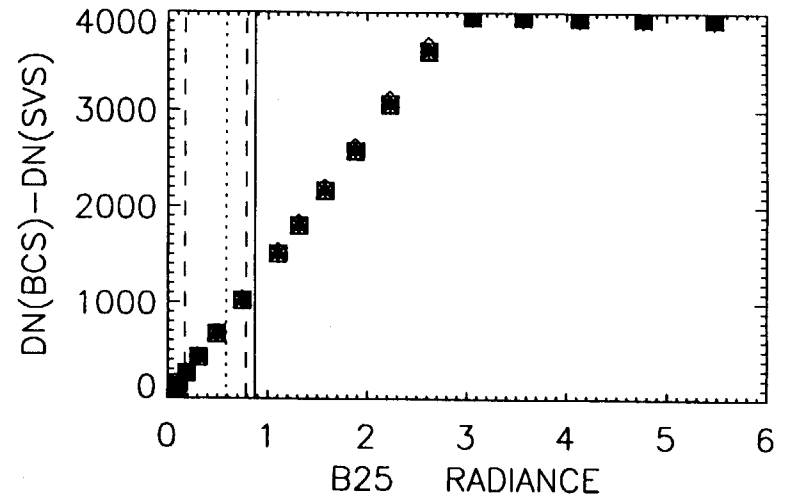
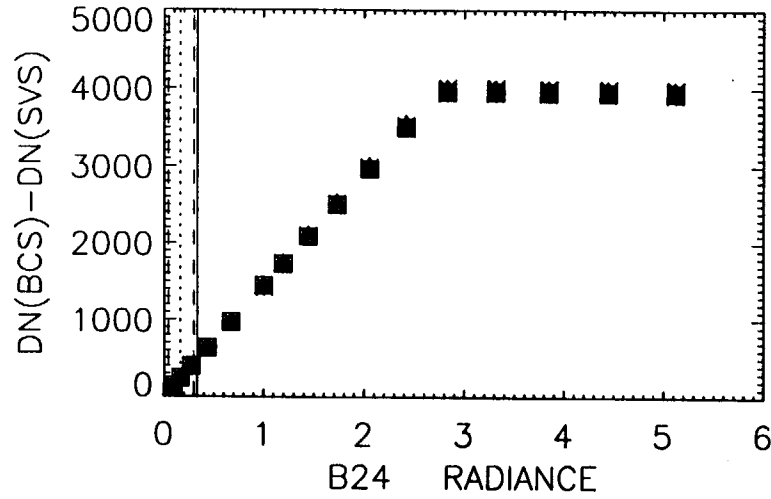


Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ    Ch5: Red ◇  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*    Ch10: Red Δ

Radiance (L) Unit:  $W / (m^2-sr-\mu m)$

Ltyp: Green Dotted Line; Lmax: Red Solid Line; .3Ltyp-0.9Lmax: Dashed Lines

NOMINAL PLATEAU (273 K); UAID: 1595 - 1618



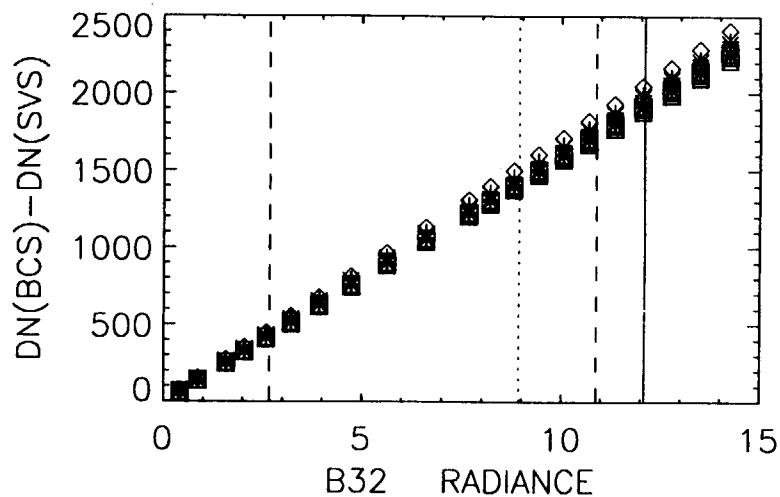
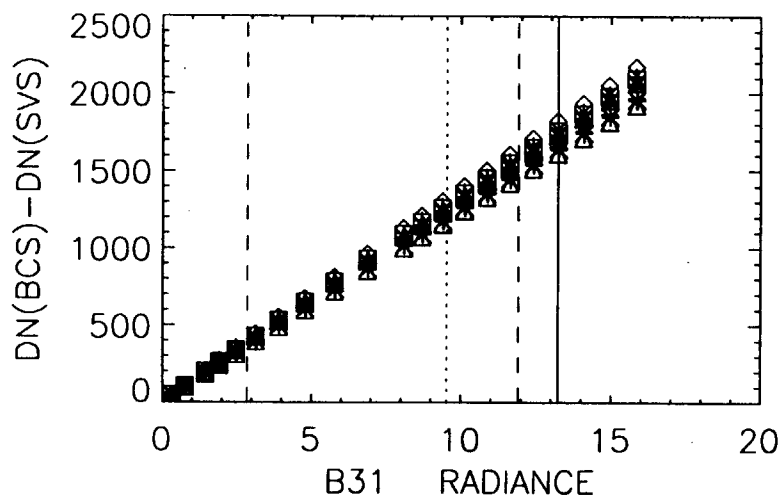
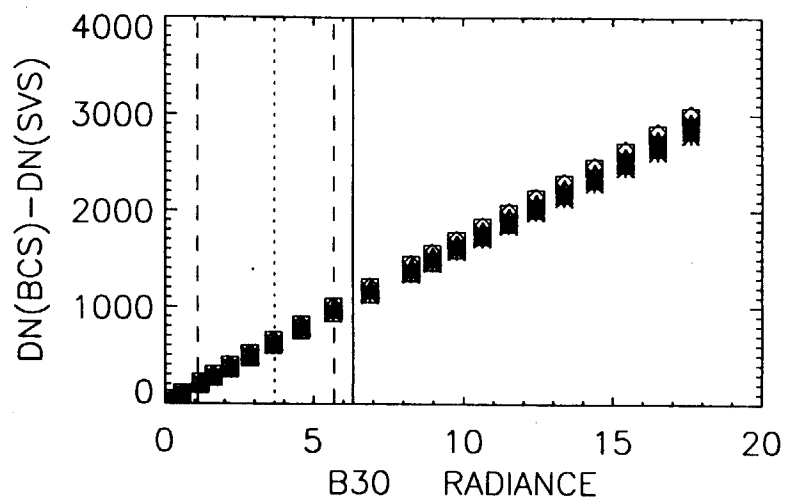
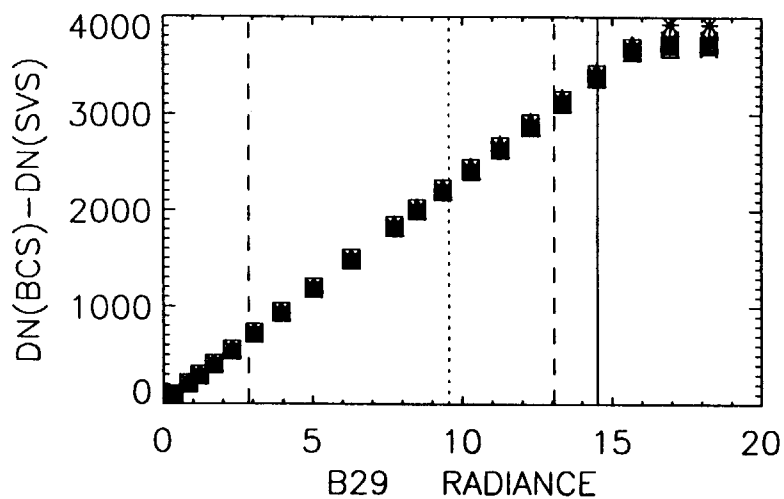
Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ    Ch5: Red ◇  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*    Ch10: Red Δ

Radiance (L) Unit:  $W / (m^2-sr-\mu m)$

Ltyp: Green Dotted Line; Lmax: Red Solid Line; .3Ltyp-0.9Lmax: Dashed Lines



NOMINAL PLATEAU (273 K); UAID: 1595 - 1618

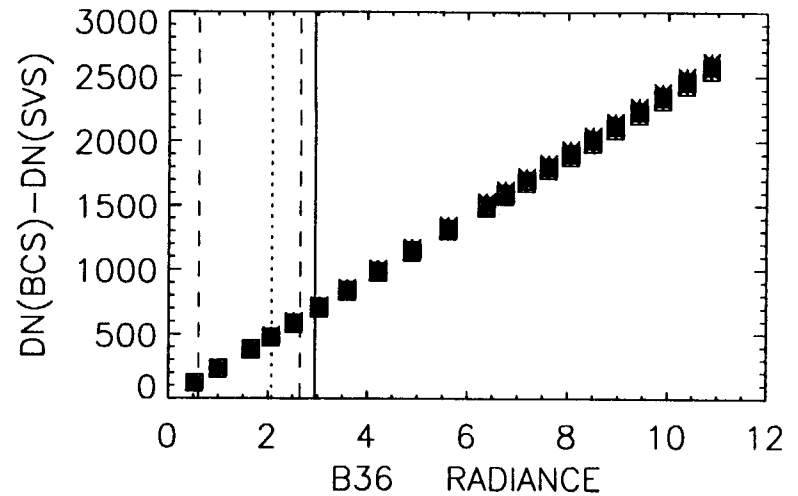
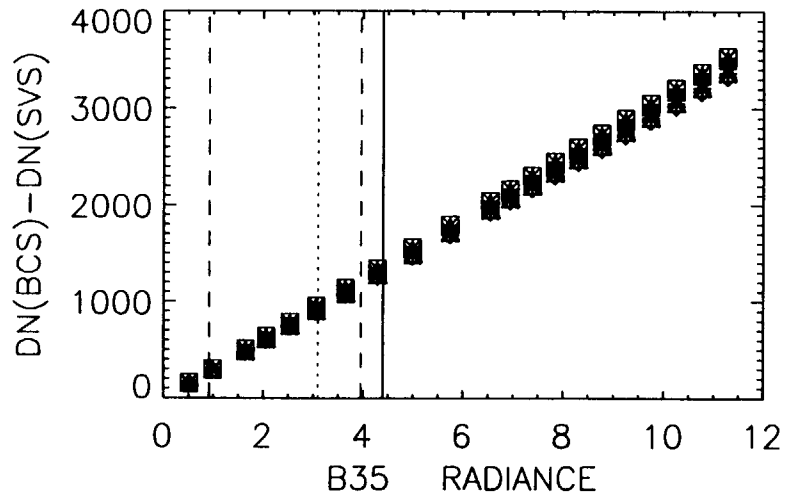
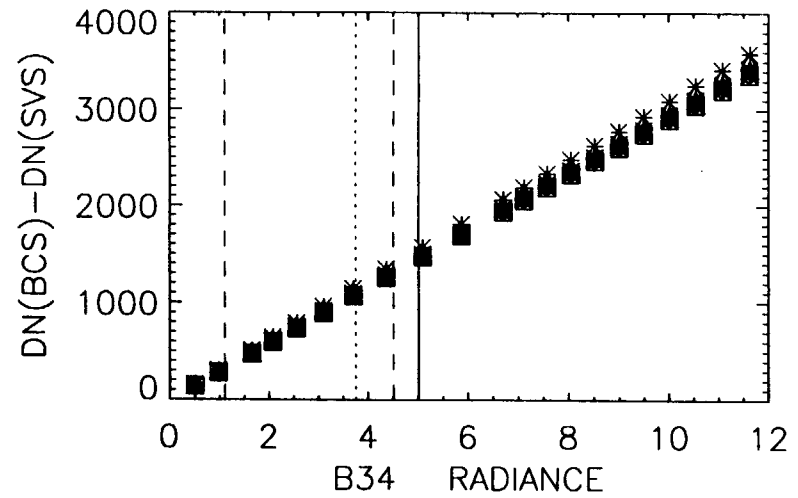
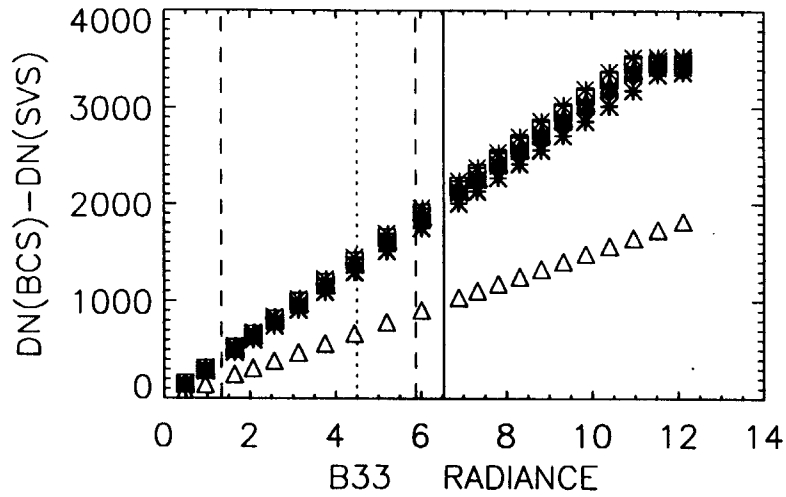


Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ    Ch5: Red ◇  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*    Ch10: Red Δ

Radiance (L) Unit:  $W / (m^2-sr-\mu m)$

Ltyp: Green Dotted Line; Lmax: Red Solid Line; .3Ltyp-0.9Lmax: Dashed Lines

NOMINAL PLATEAU (273 K); UAID: 1595 - 1618

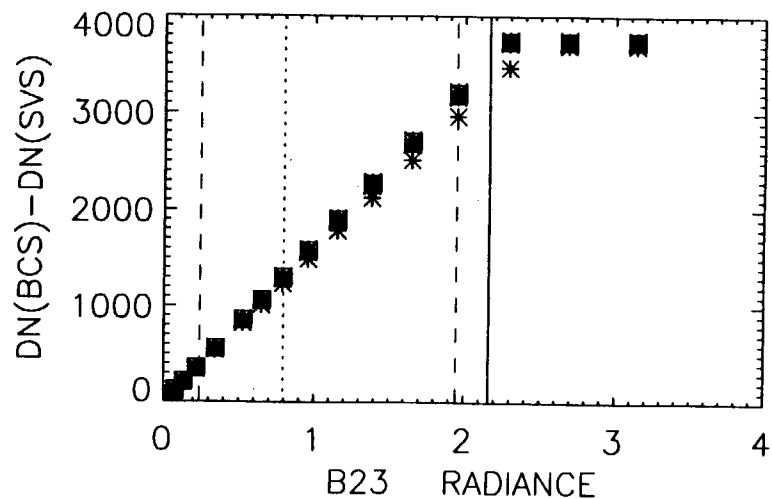
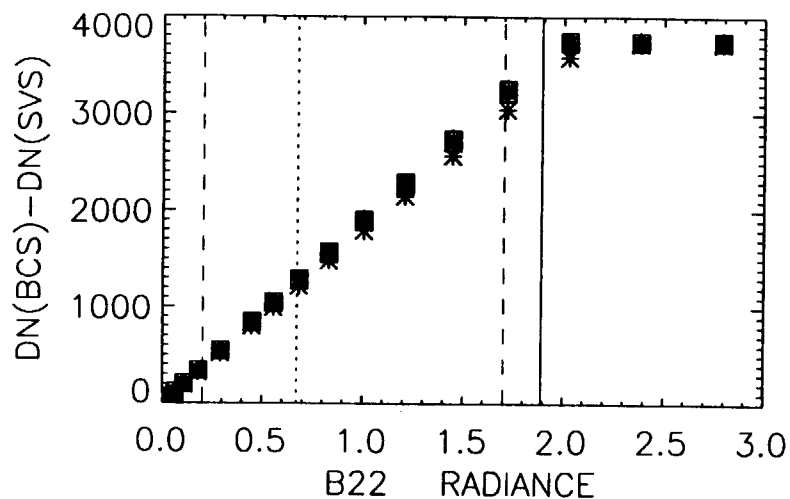
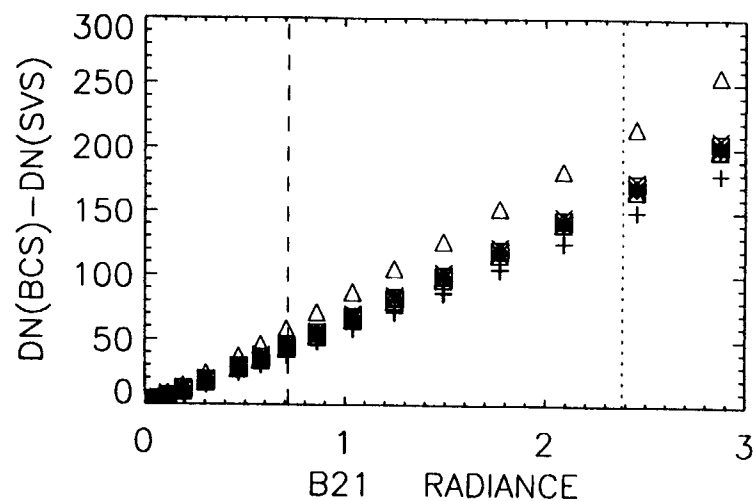
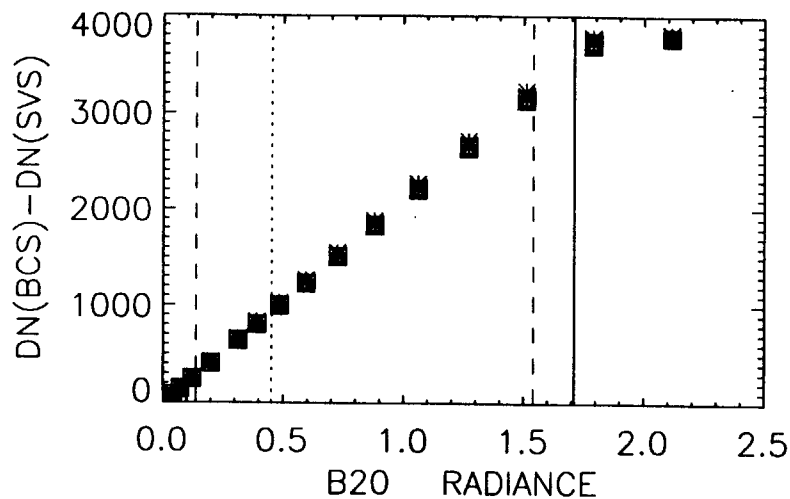


Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ    Ch5: Red ◇  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*    Ch10: Red Δ

Radiance (L) Unit:  $W / (m^2-sr-\mu m)$

Ltyp: Green Dotted Line; Lmax: Red Solid Line; .3Ltyp-0.9Lmax: Dashed Lines

HOT PLATEAU (283 K); UAID: 1402 - 1426

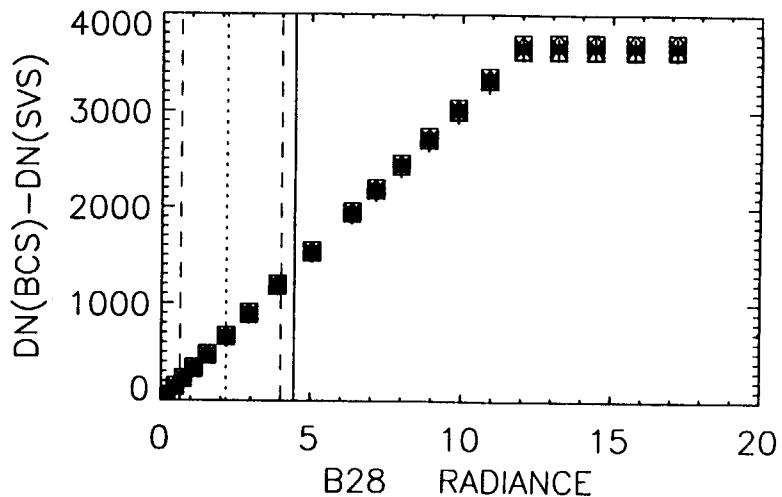
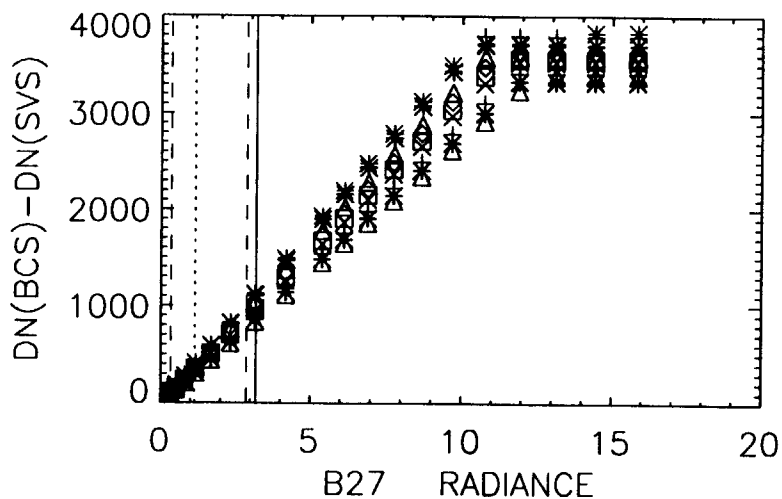
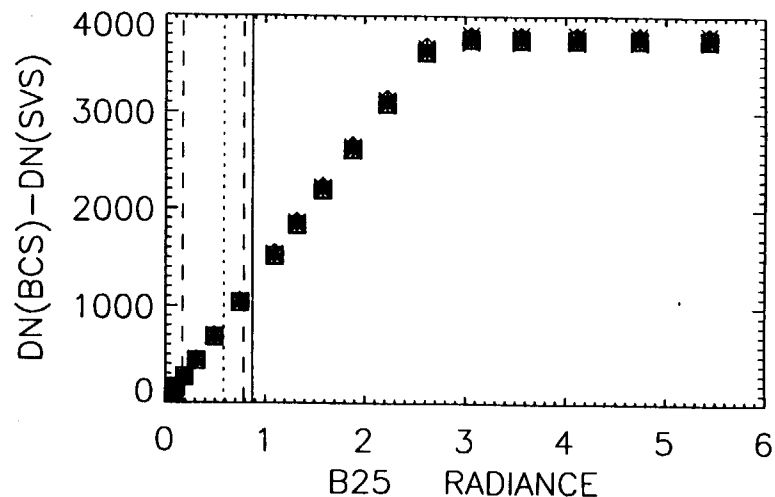
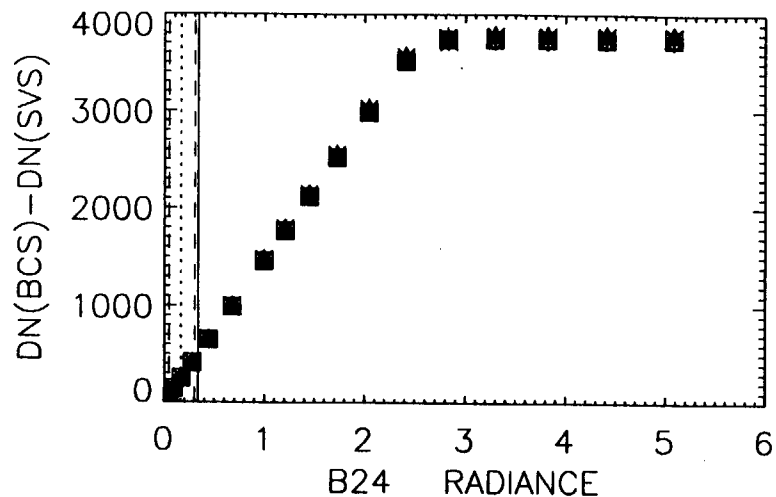


Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ    Ch5: Red ◇  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*    Ch10: Red Δ

Radiance (L) Unit: W / (m<sup>2</sup>-sr-μm)

Ltyp: Green Dotted Line; Lmax: Red Solid Line; .3Ltyp-0.9Lmax: Dashed Lines

HOT PLATEAU (283 K); UAID: 1402 - 1426

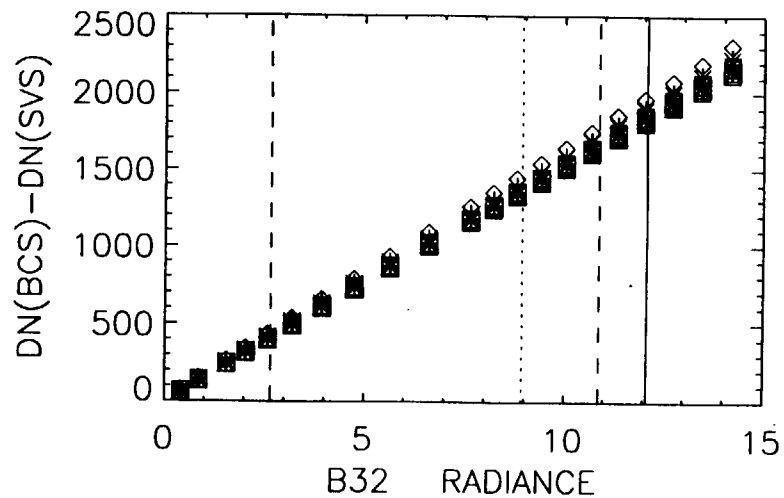
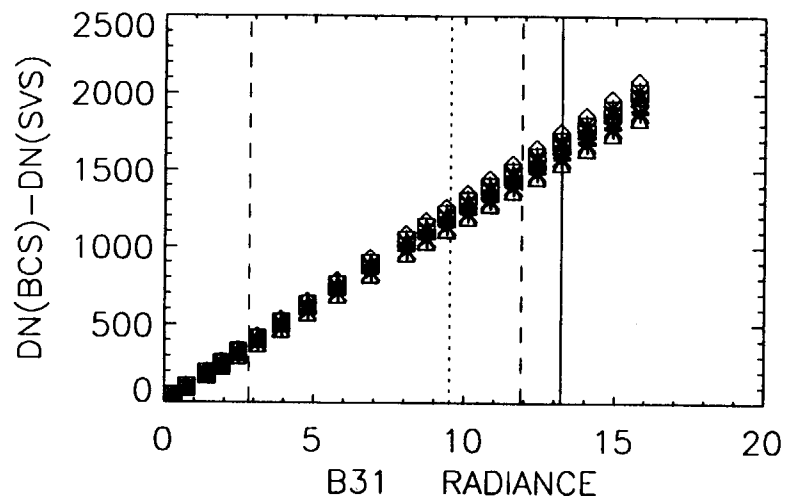
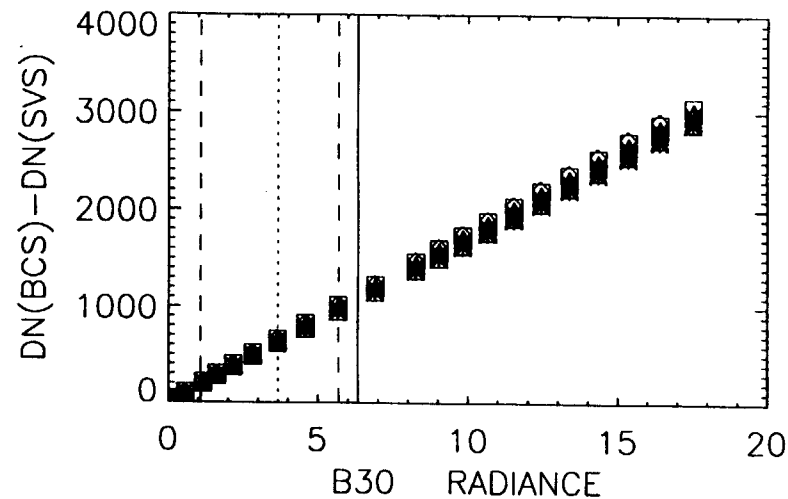
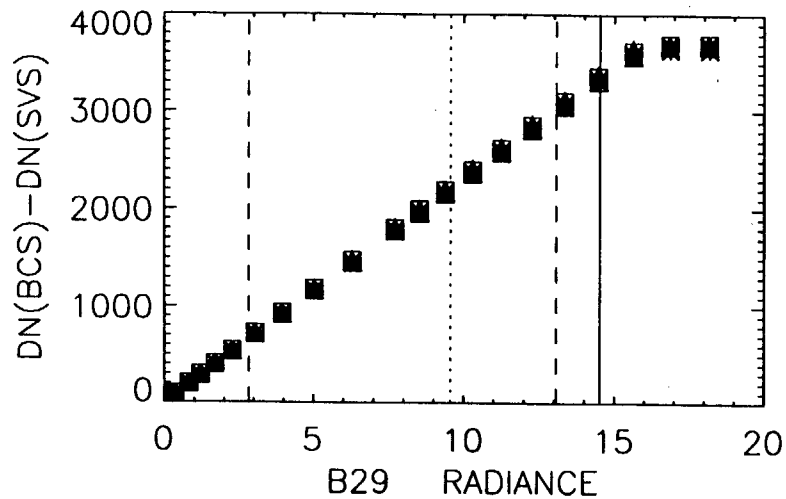


Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ    Ch5: Red ◇  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*    Ch10: Red Δ

Radiance (L) Unit:  $W / (m^2-sr-\mu m)$

Ltyp: Green Dotted Line; Lmax: Red Solid Line; .3Ltyp-0.9Lmax: Dashed Lines

HOT PLATEAU (283 K); UAID: 1402 - 1426

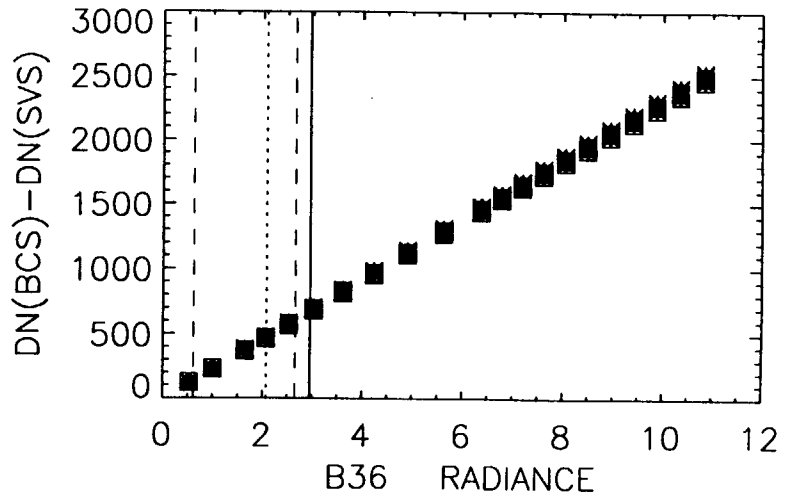
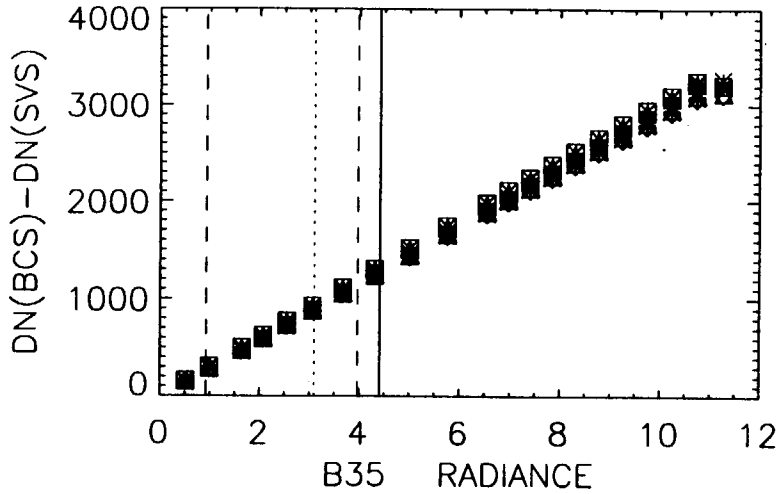
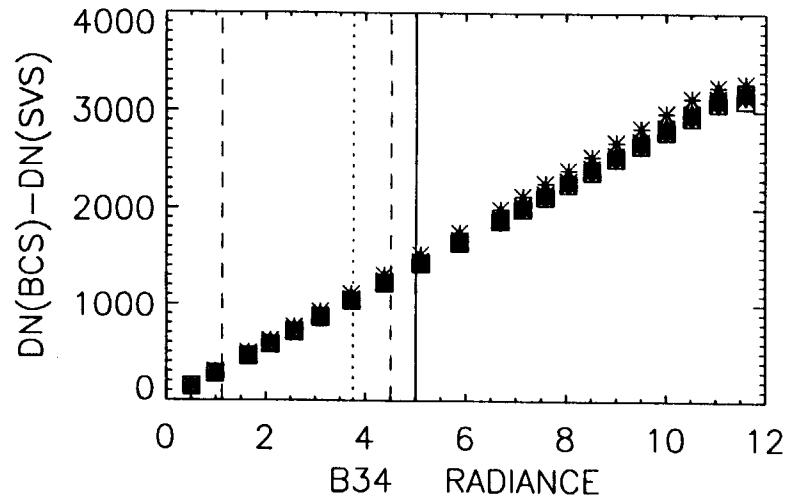
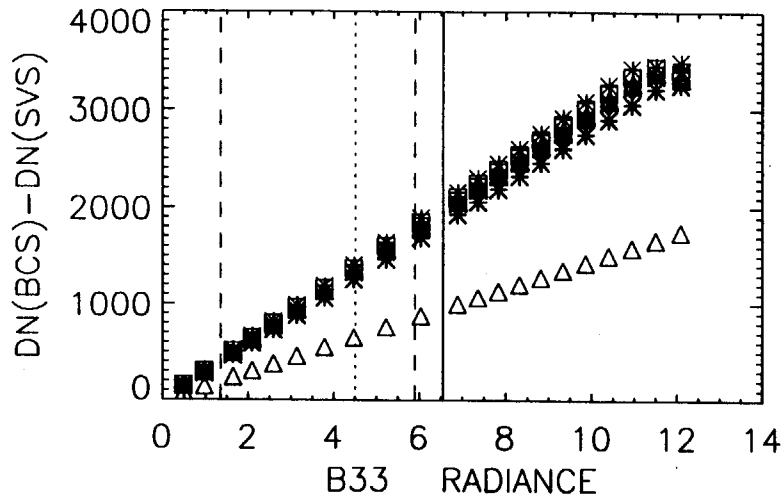


Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ    Ch5: Red ◇  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*    Ch10: Red Δ

Radiance (L) Unit:  $W / (m^2-sr-\mu m)$

Ltyp: Green Dotted Line; Lmax: Red Solid Line; .3Ltyp-0.9Lmax: Dashed Lines

HOT PLATEAU (283 K); UAID: 1402 - 1426



Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ    Ch5: Red ◇  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*    Ch10: Red Δ

Radiance (L) Unit:  $W / (m^2-sr-\mu m)$

Ltyp: Green Dotted Line; Lmax: Red Solid Line; .3Ltyp-0.9Lmax: Dashed Lines

# Band-by-Band Calibration Fitting Summaries



# Band 20 Calibration Fitting Summary

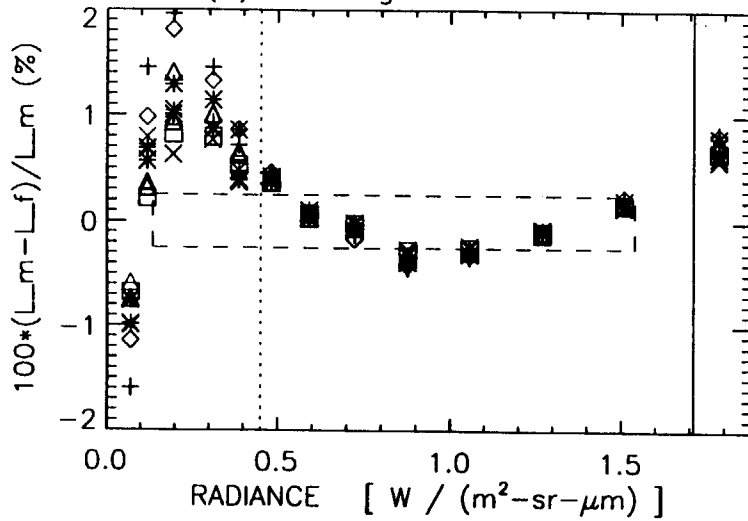


Instrument Temperature	# of BCS levels used	Cold Plateau (256K)	Nominal 1 (273K)	Nominal 2 (273K)	Hot Plateau (283K)
Quadratic Fitting (240 K - 330 K)	14				
Quadratic Fitting (220 K - 330 K)	16				
Cubic Fitting (240 K - 330 K)	14				
Cubic Fitting (220 K - 330 K)	16				

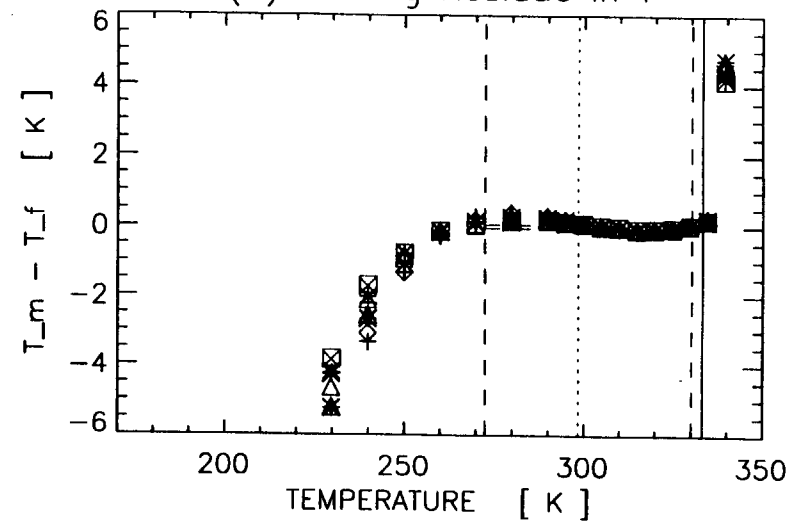


B20 L vs DN Quadratic Fitting; Cold Plateau (256 K); UAID: 1315 - 1337

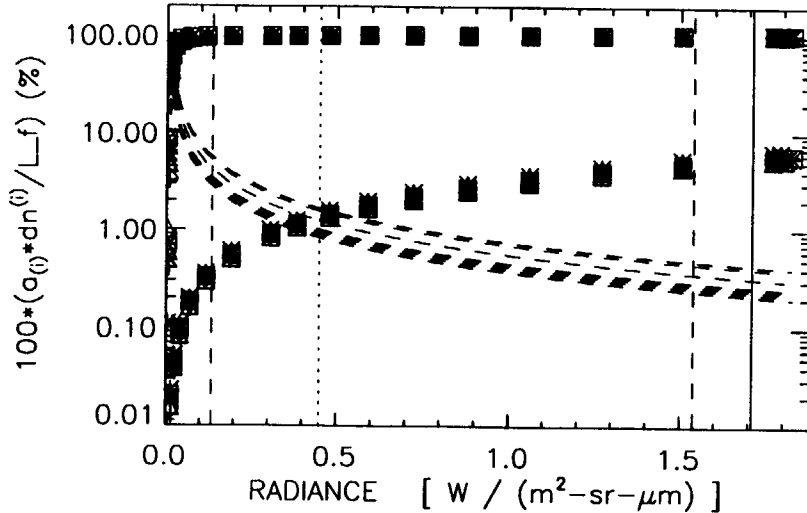
(A) Fitting Residue in L%



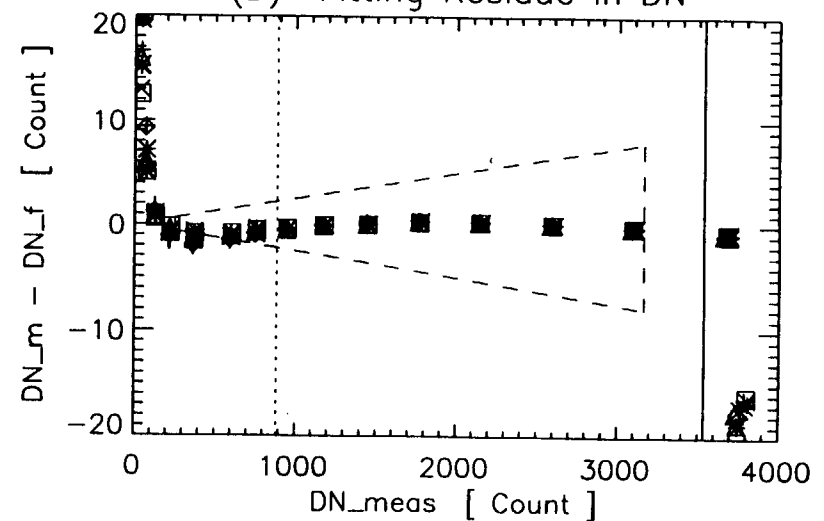
(B) Fitting Residue in T



(C) 0, 1st, 2nd Order Contribution



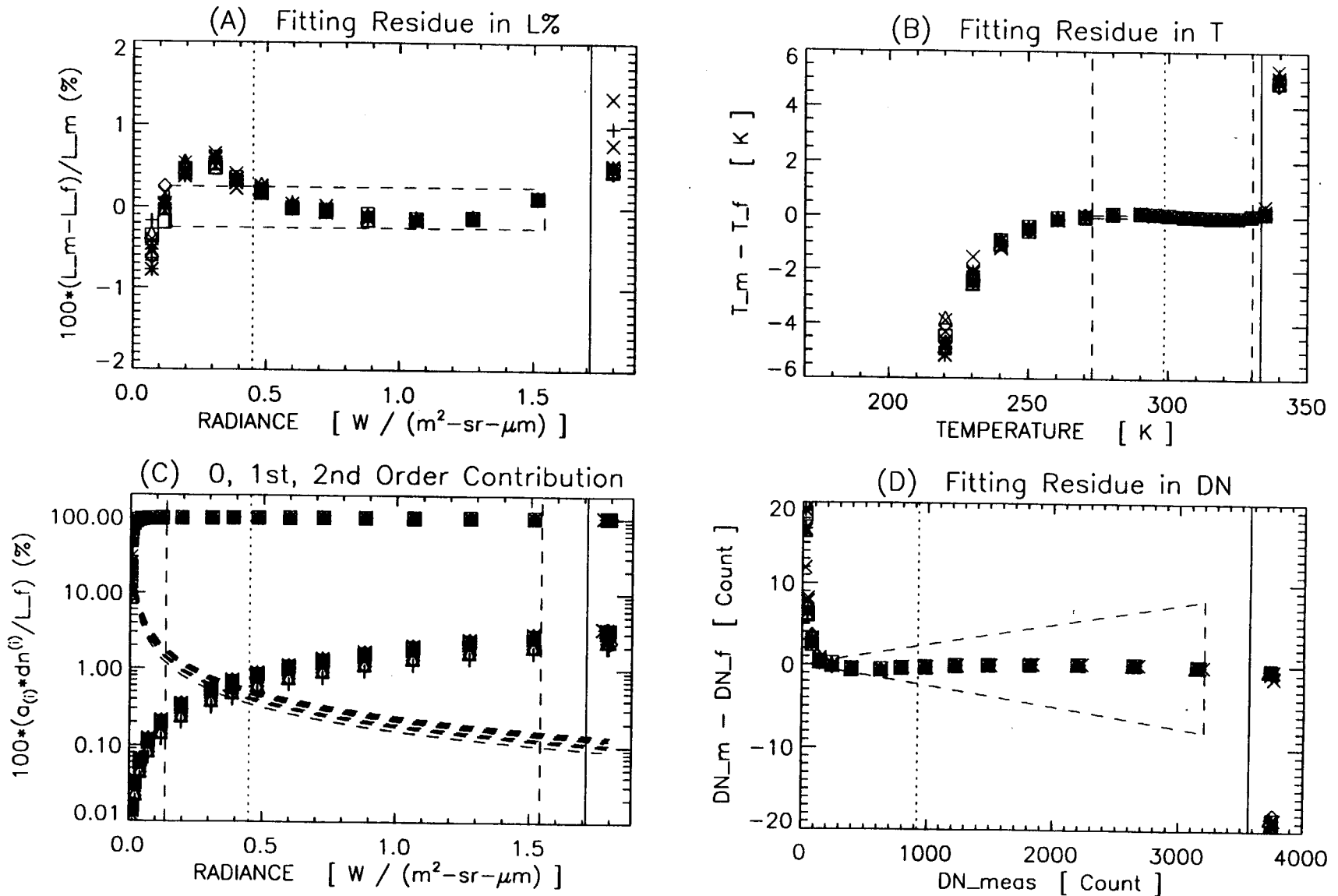
(D) Fitting Residue in DN



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.45 (Grn Dotted Line); Lmax = 1.71 (Red Solid Line)  
 0.3Ltyp = 0.14; 0.9Lmax = 1.54 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 240 (K) - 330 (K)  
 0.04Ltyp - 0.88Lmax

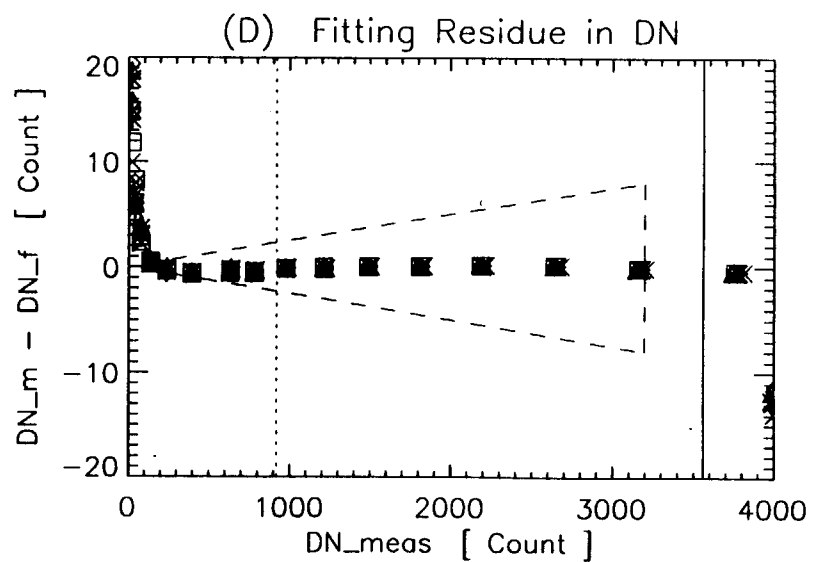
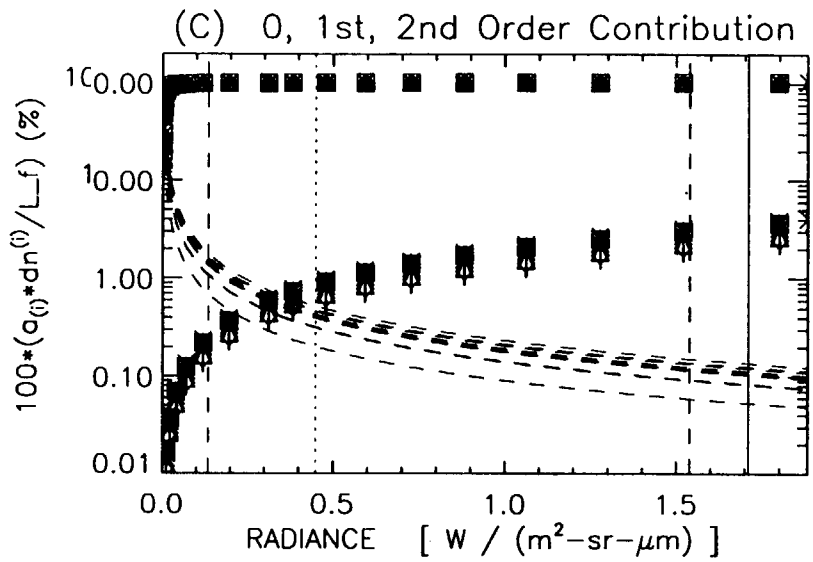
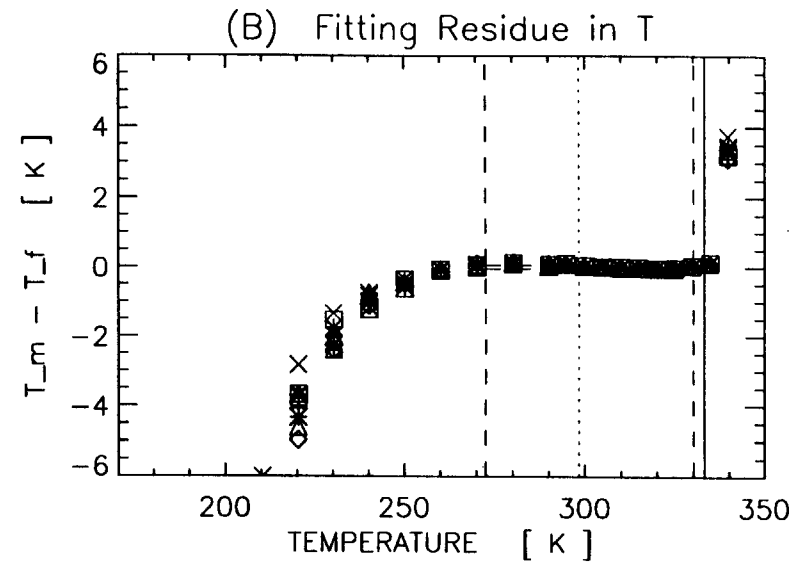
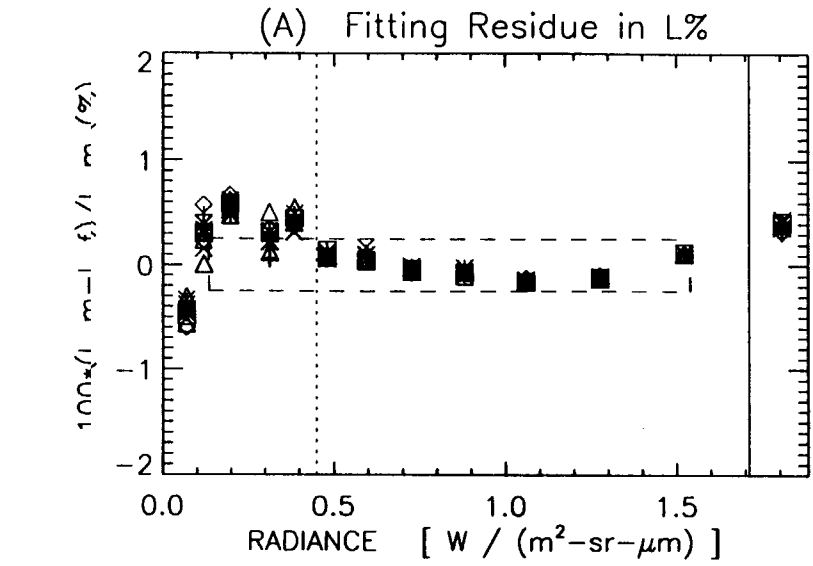
B20 L vs DN Quadratic Fitting; Nominal Plateau 1 (273 K); UAID: 1506 – 1526



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.45 (Grn Dotted Line); Lmax = 1.71 (Red Solid Line)  
 0.3Ltyp = 0.14; 0.9Lmax = 1.54 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 240 (K) – 330 (K)  
 0.05Ltyp – 0.88Lmax

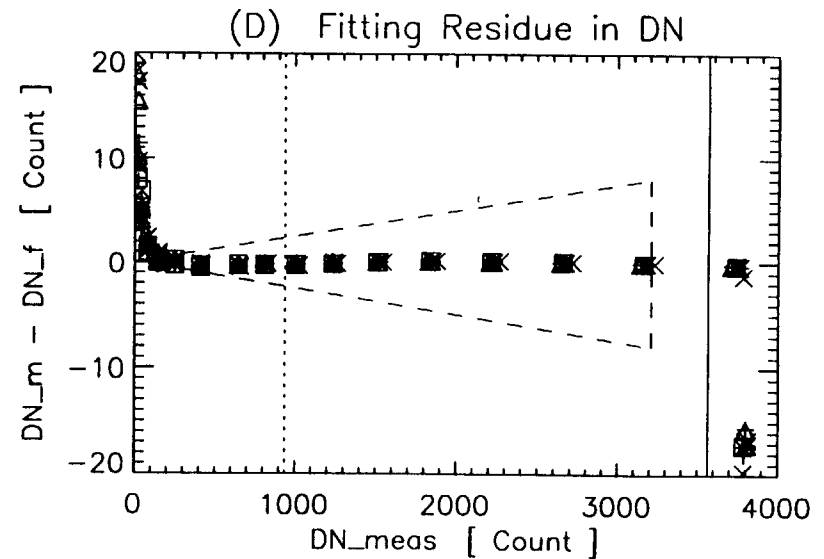
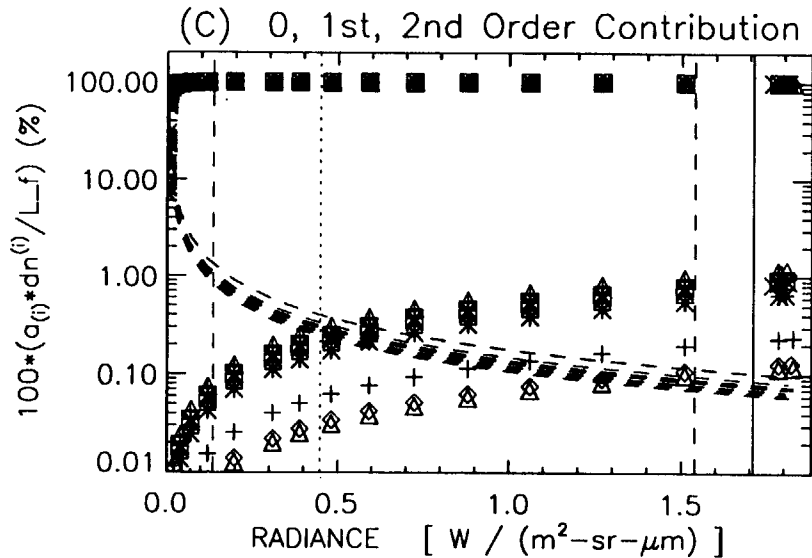
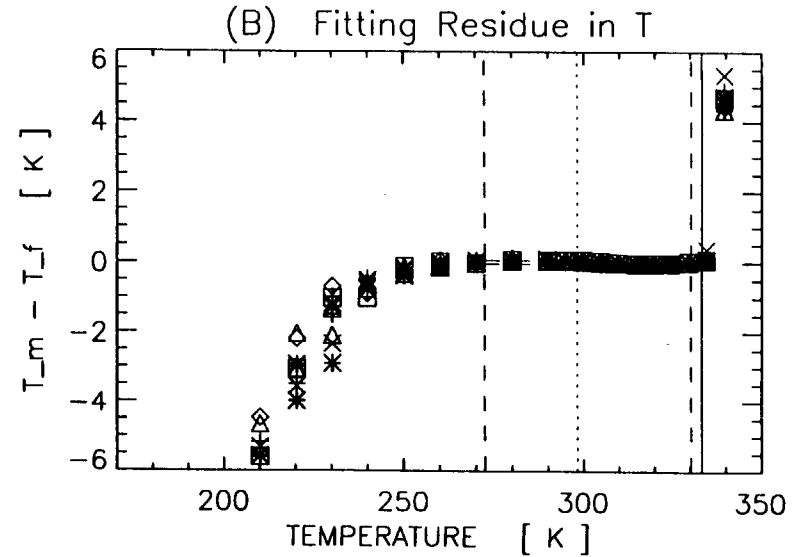
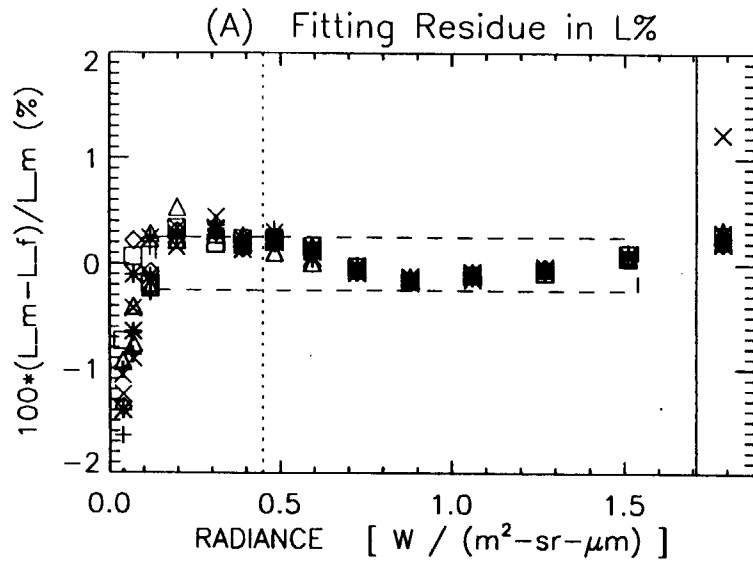
B20 L vs DN Quadratic Fitting; Nominal Plateau 2 (273 K); UAID: 1595 – 1618



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.45 (Grn Dotted Line); Lmax = 1.71 (Red Solid Line)  
 0.3Ltyp = 0.14; 0.9Lmax = 1.54 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 240 (K) – 330 (K)  
 0.05Ltyp – 0.89Lmax

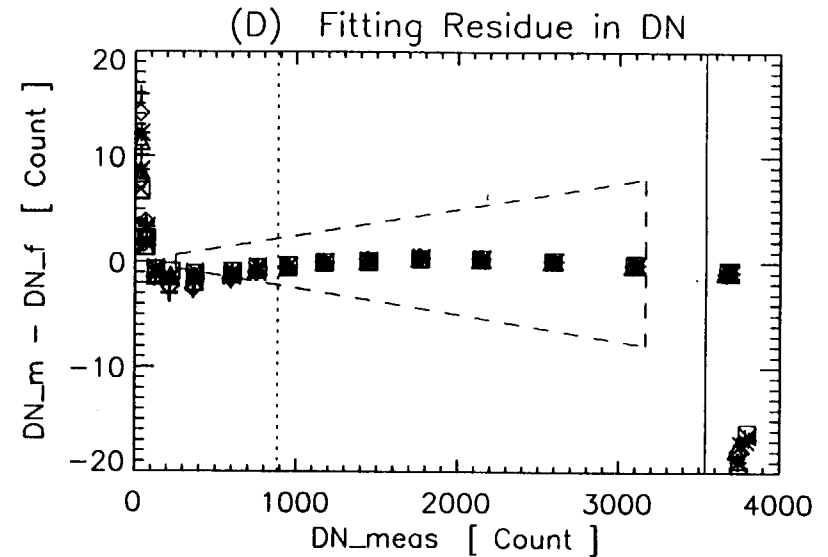
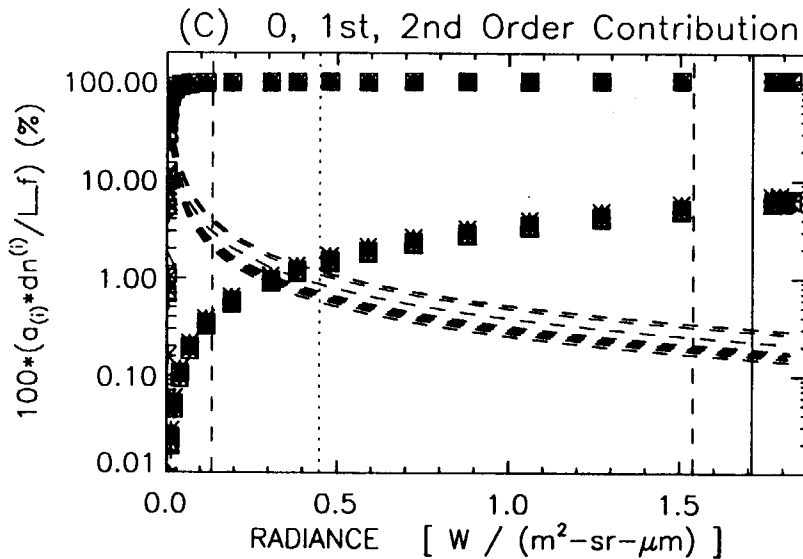
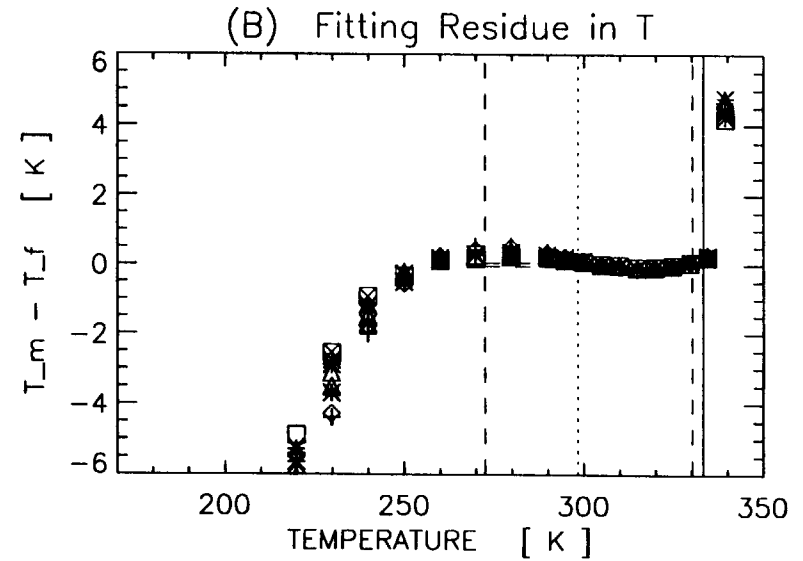
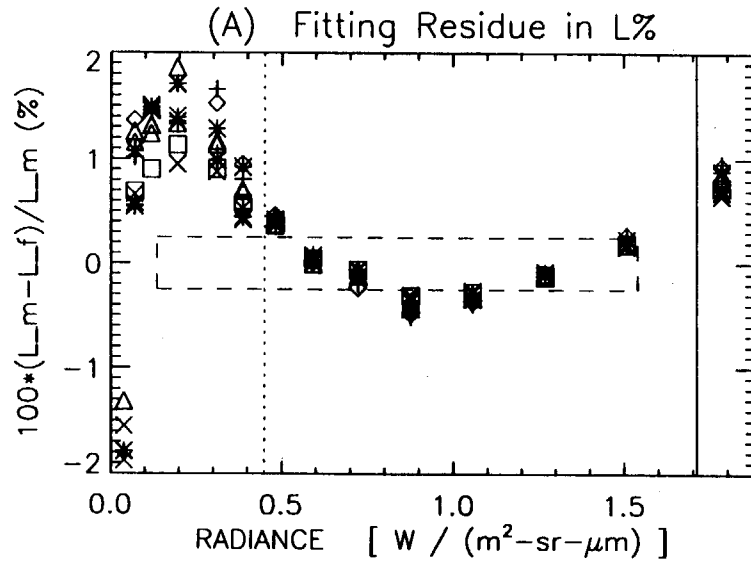
B20 L vs DN Quadratic Fitting; Hot Plateau (283 K); UAID: 1402 - 1426



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.45 (Grn Dotted Line); Lmax = 1.71 (Red Solid Line)  
 0.3Ltyp = 0.14; 0.9Lmax = 1.54 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 240 (K) - 330 (K)  
 0.05Ltyp - 0.88Lmax

B20 L vs DN Quadratic Fitting; Cold Plateau (256 K); UAID: 1315 - 1337

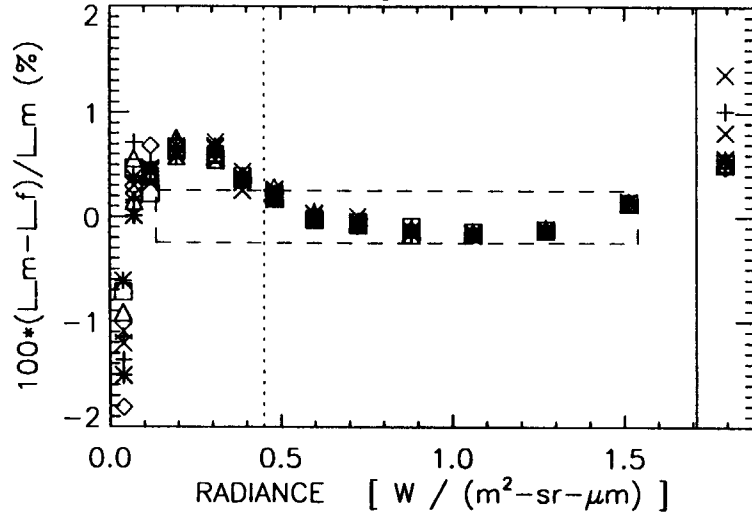


Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.45 (Grn Dotted Line); Lmax = 1.71 (Red Solid Line)  
 0.3Ltyp = 0.14; 0.9Lmax = 1.54 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) × ±1/2 Goal\*

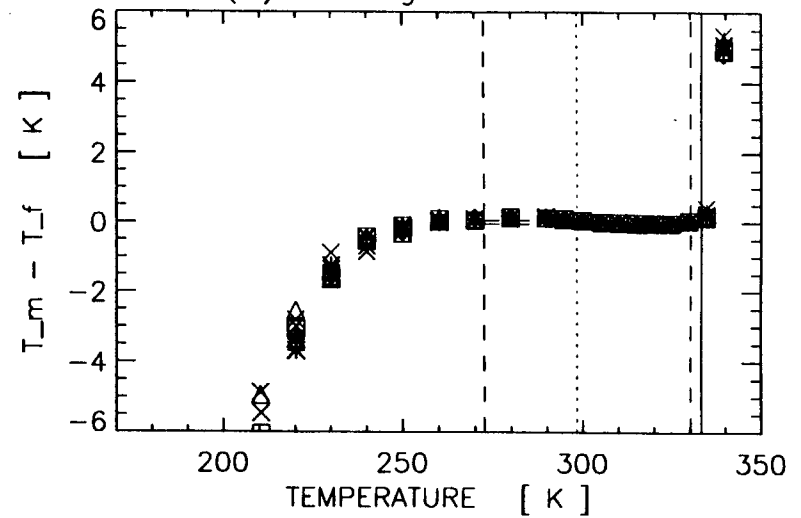
Fitting Range: 220 (K) - 330 (K)  
 0.01Ltyp - 0.88Lmax

B20 L vs DN Quadratic Fitting; Nominal Plateau 1 (273 K); UAID: 1506 – 1526

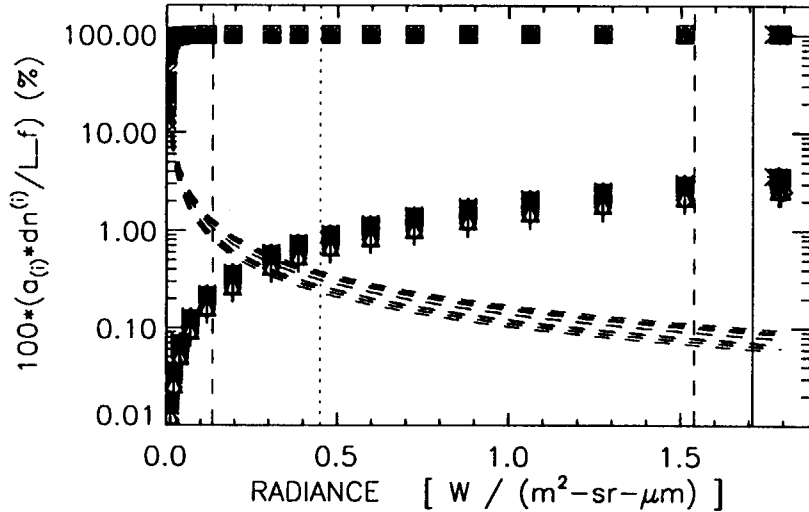
(A) Fitting Residue in L%



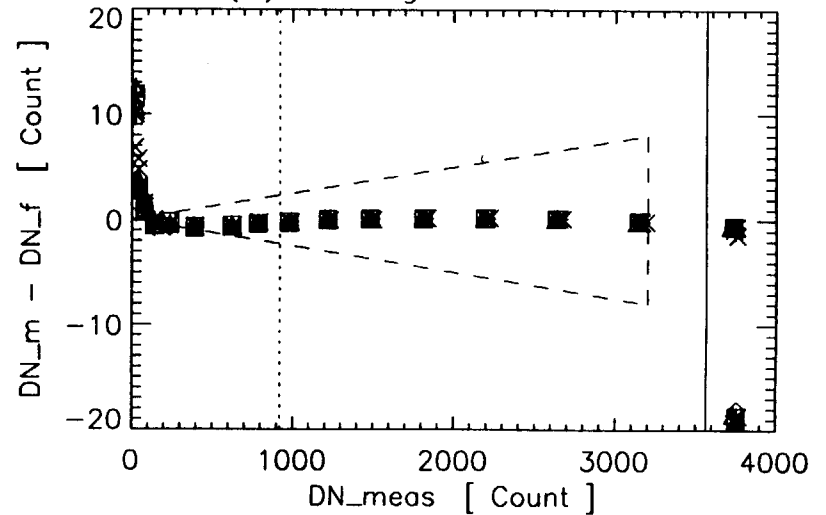
(B) Fitting Residue in T



(C) 0, 1st, 2nd Order Contribution



(D) Fitting Residue in DN

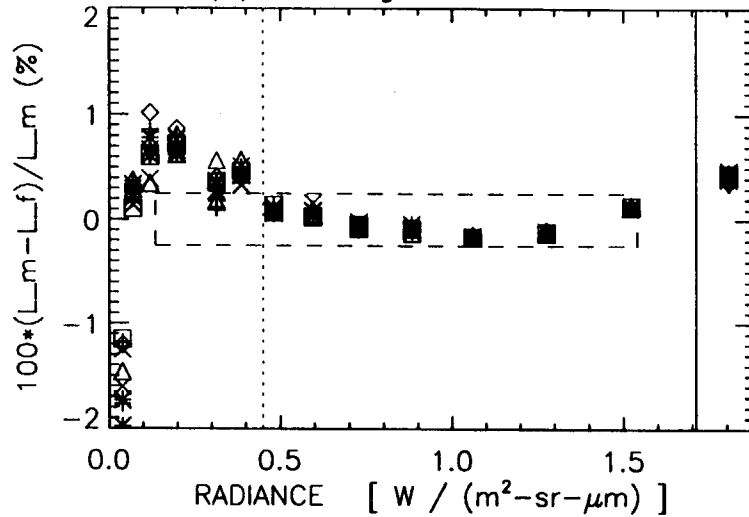


Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.45 (Grn Dotted Line); Lmax = 1.71 (Red Solid Line)  
 0.3Ltyp = 0.14; 0.9Lmax = 1.54 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

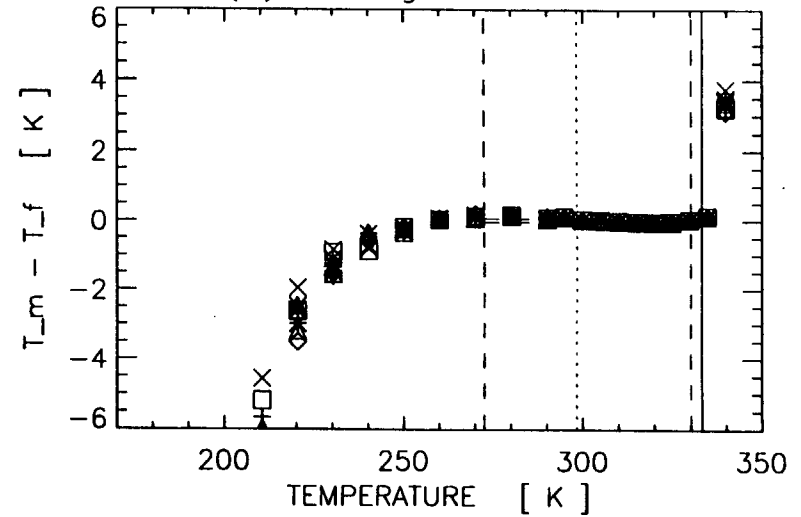
Fitting Range: 220 (K) - 330 (K)  
 0.01Ltyp - 0.88Lmax

B20 L vs DN Quadratic Fitting; Nominal Plateau 2 (273 K); UAID: 1595 - 1618

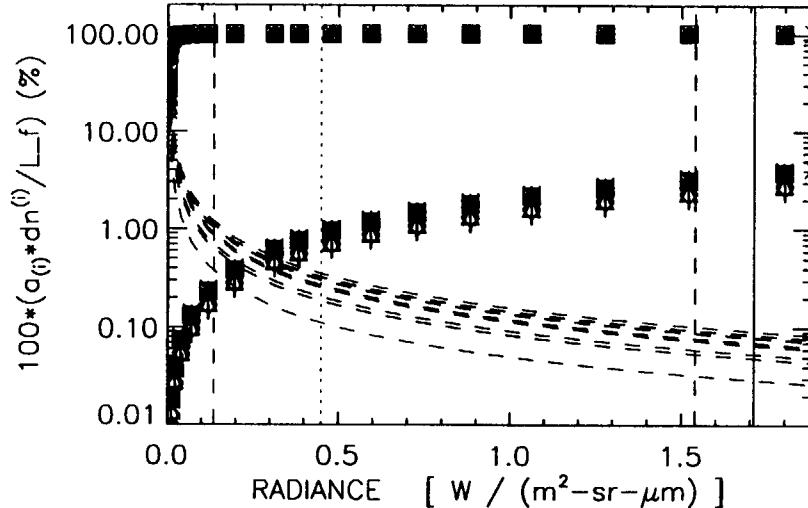
(A) Fitting Residue in L%



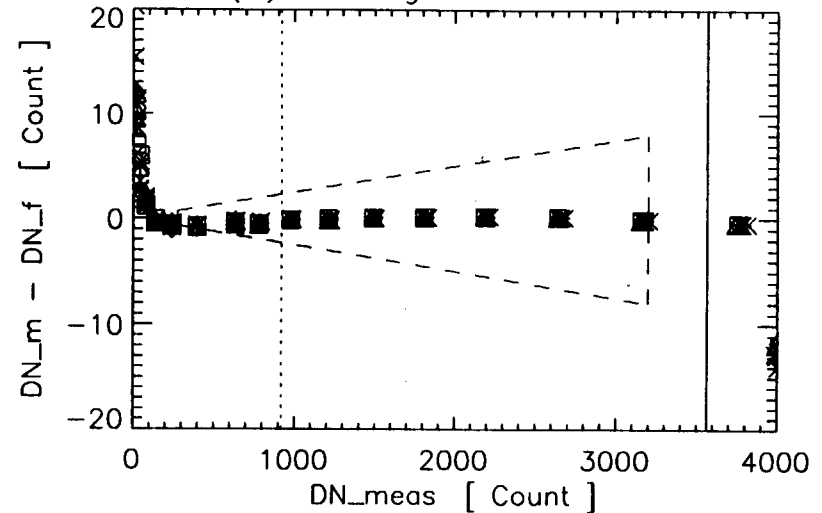
(B) Fitting Residue in T



(C) 0, 1st, 2nd Order Contribution



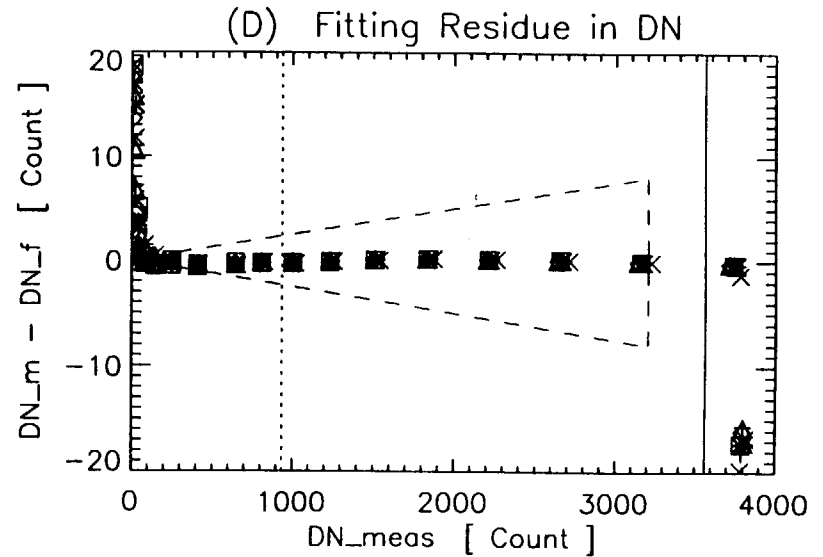
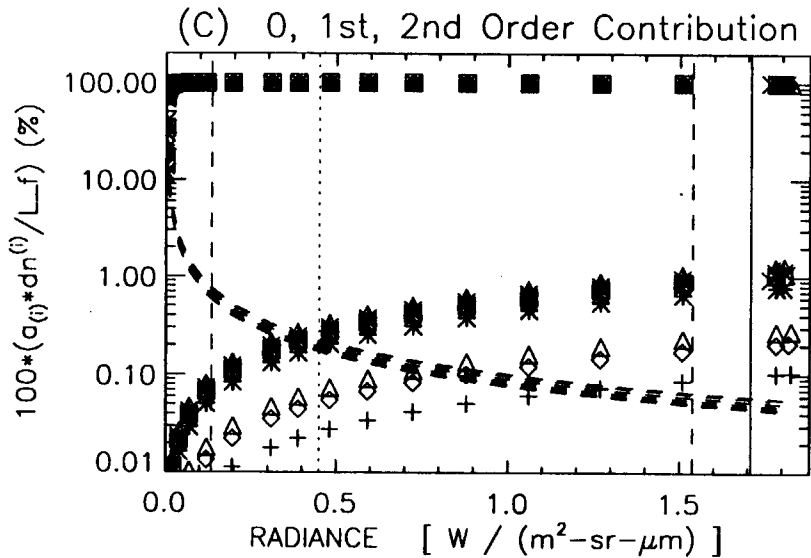
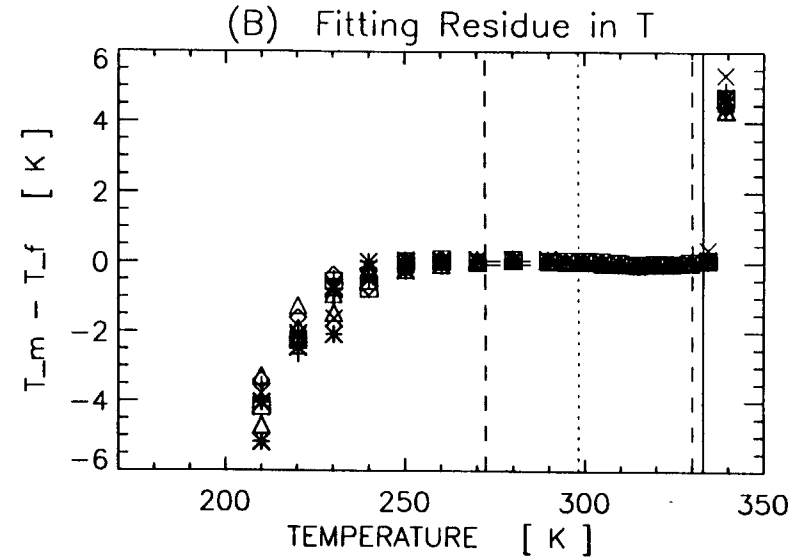
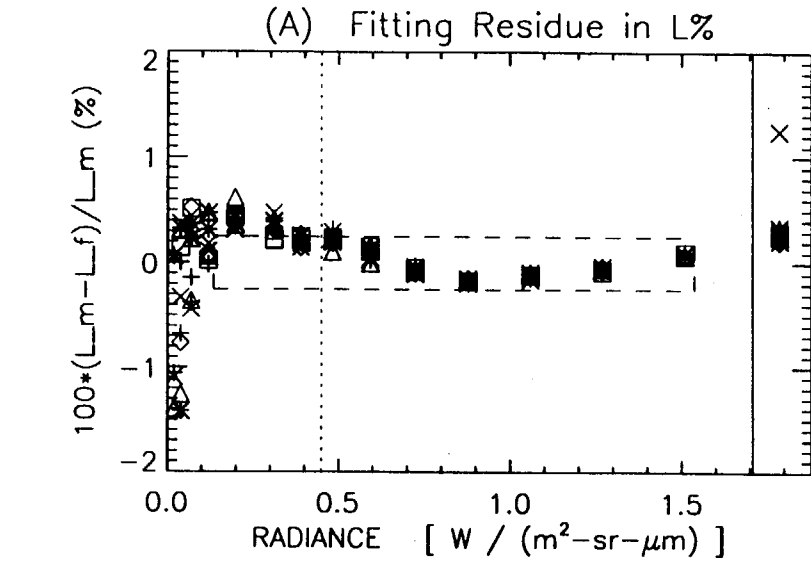
(D) Fitting Residue in DN



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.45 (Grn Dotted Line); Lmax = 1.71 (Red Solid Line)  
 0.3Ltyp = 0.14; 0.9Lmax = 1.54 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 220 (K) - 330 (K)  
 0.01Ltyp - 0.89Lmax

B20 L vs DN Quadratic Fitting; Hot Plateau (283 K); UAID: 1402 - 1426



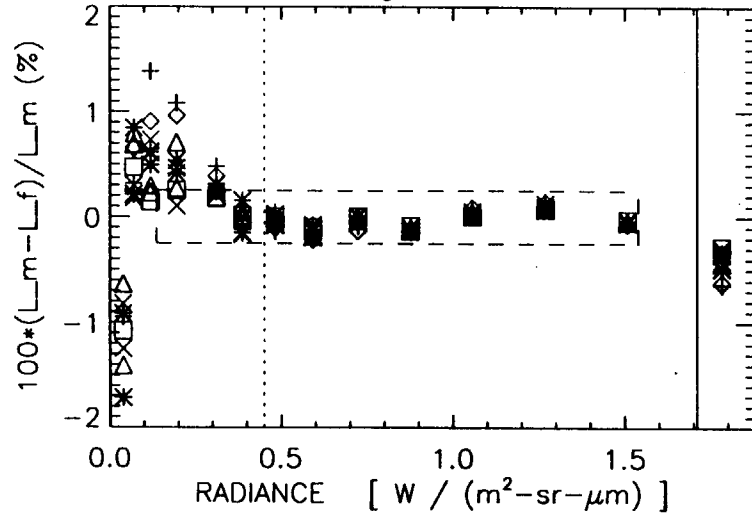
Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.45 (Grn Dotted Line); Lmax = 1.71 (Red Solid Line)  
 0.3Ltyp = 0.14; 0.9Lmax = 1.54 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 220 (K) - 330 (K)  
 0.01Ltyp - 0.88Lmax

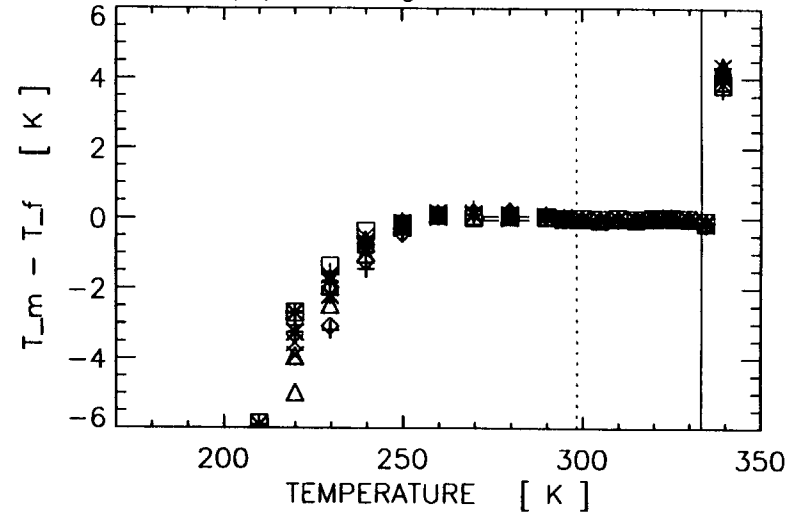


B20 L vs DN Cubic Fitting; Cold Plateau (256 K); UAID: 1315 - 1337

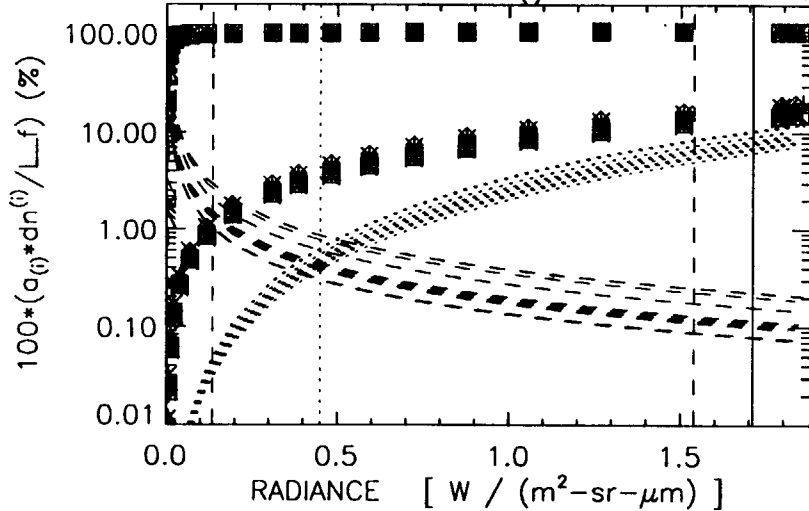
(A) Fitting Residue in L%



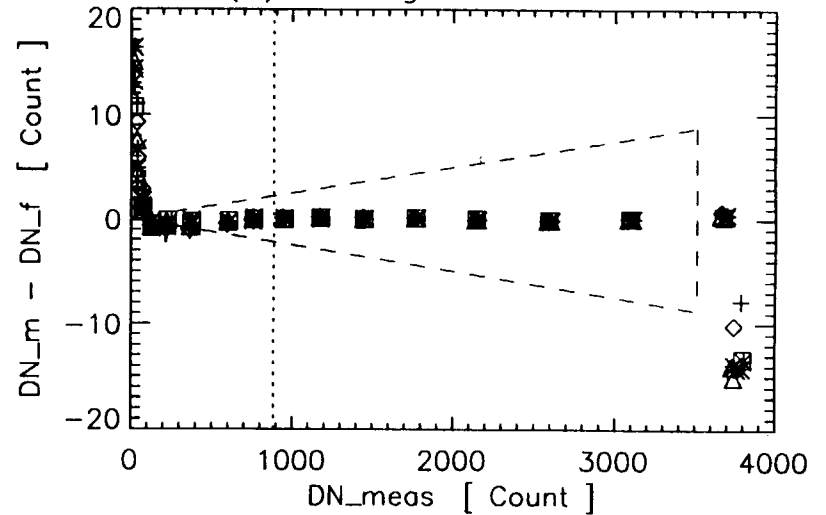
(B) Fitting Residue in T



(C) Coefficient  $a_{(i)}$  Contribution



(D) Fitting Residue in DN

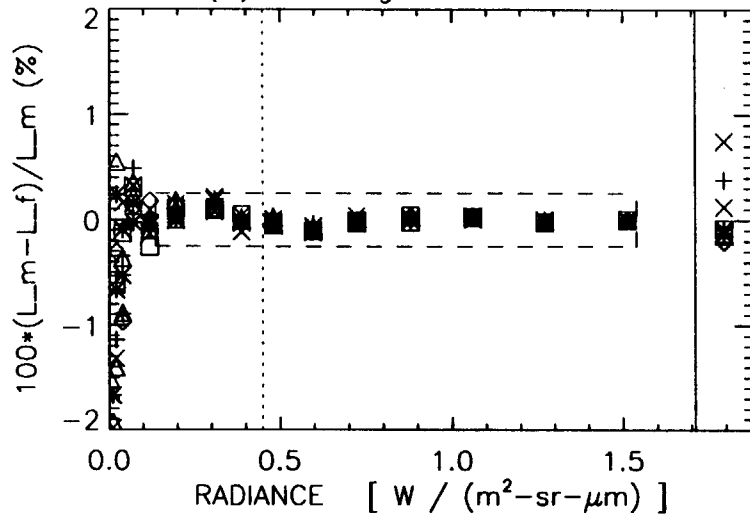


Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.45 (Grn Dotted Line); Lmax = 1.71 (Red Solid Line)  
 0.3Ltyp = 0.14; 0.9Lmax = 1.54 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

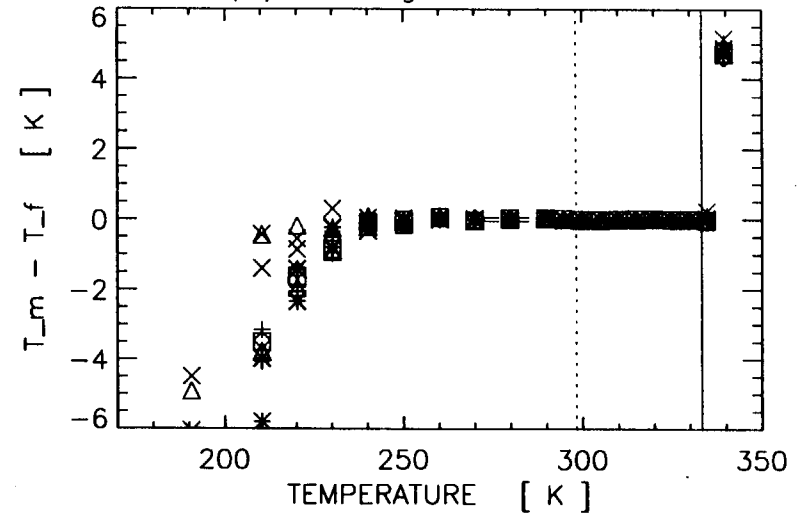
Fitting Range: 240 (K) - 330 (K)  
 0.04Ltyp - 0.88Lmax

B20 L vs DN Cubic Fitting; Nominal Plateau 1 (273 K); UAID: 1506 – 1526

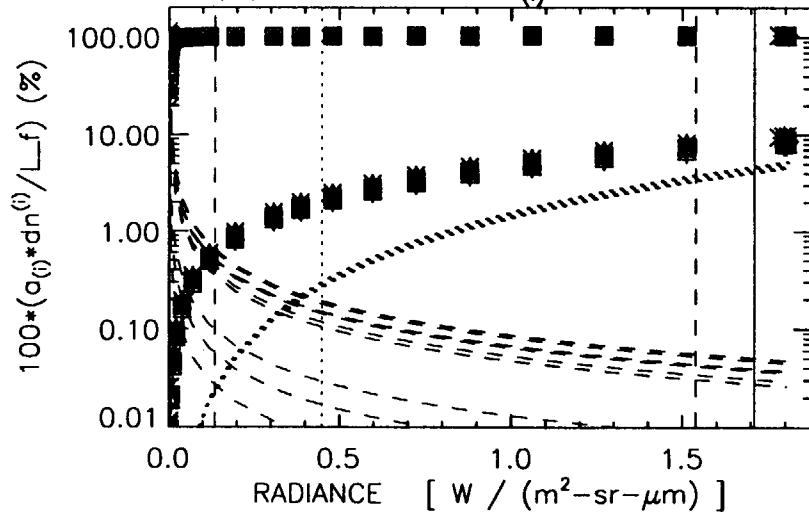
(A) Fitting Residue in L%



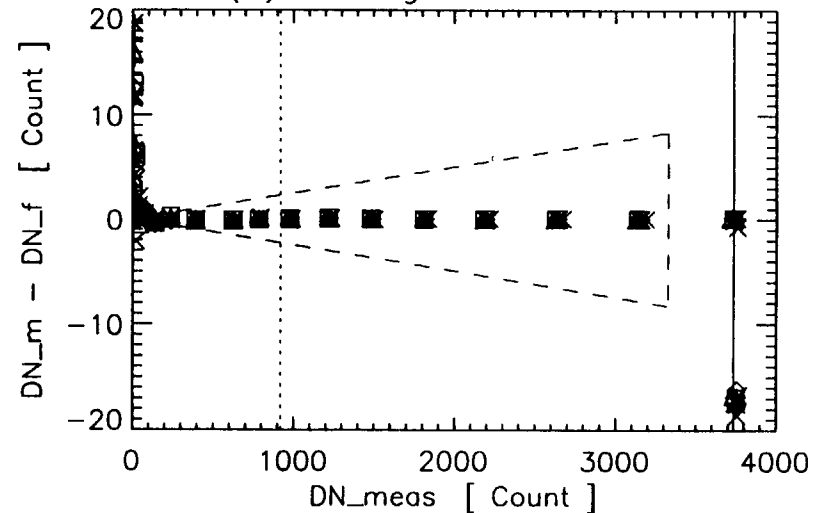
(B) Fitting Residue in T



(C) Coefficient  $a_{(i)}$  Contribution



(D) Fitting Residue in DN

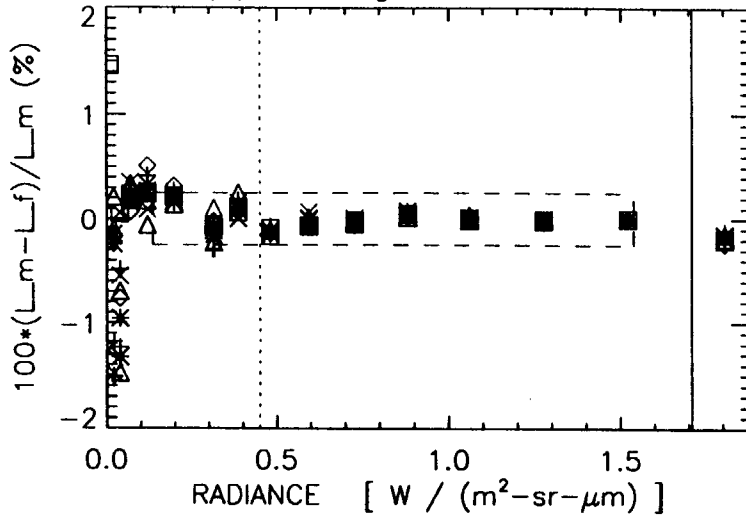


Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.45 (Grn Dotted Line); Lmax = 1.71 (Red Solid Line)  
 0.3Ltyp = 0.14; 0.9Lmax = 1.54 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

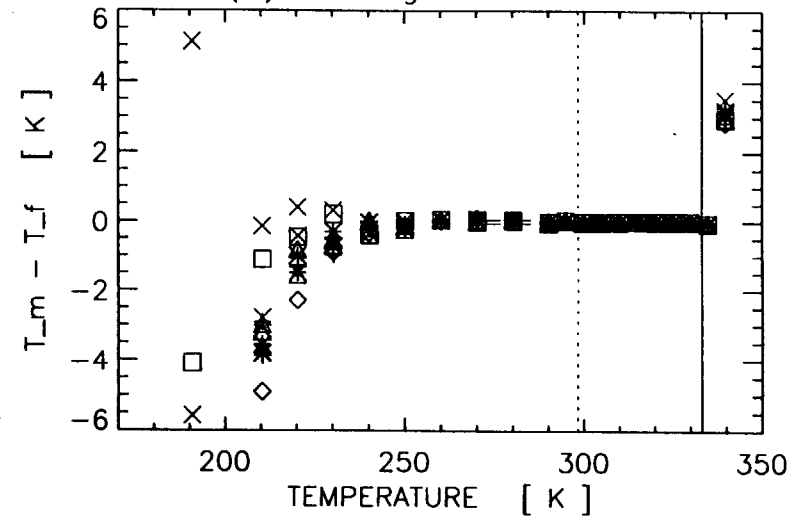
Fitting Range: 240 (K) - 330 (K)  
 0.05Ltyp - 0.88Lmax

B20 L vs DN Cubic Fitting; Nominal Plateau 2 (273 K); UAID: 1595 – 1618

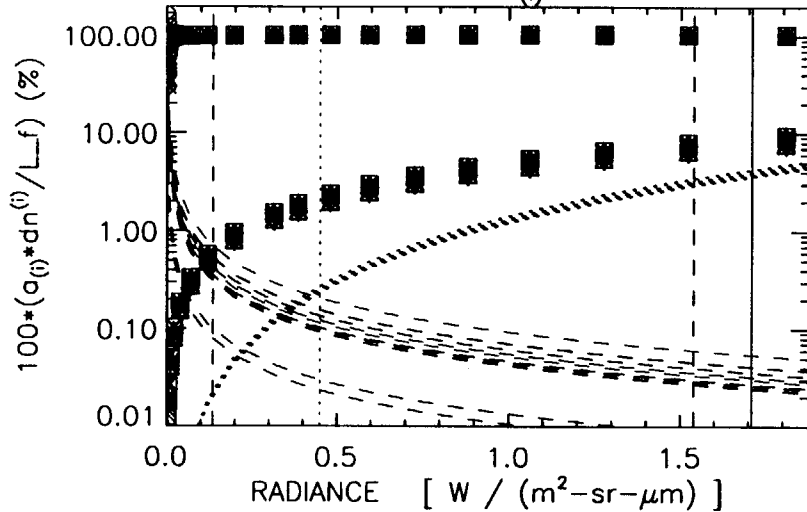
(A) Fitting Residue in L%



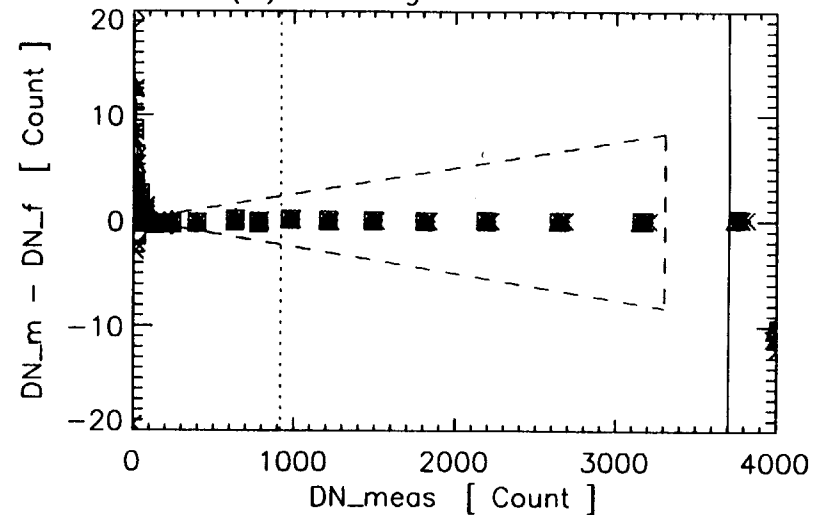
(B) Fitting Residue in T



(C) Coefficient  $a_{(i)}$  Contribution



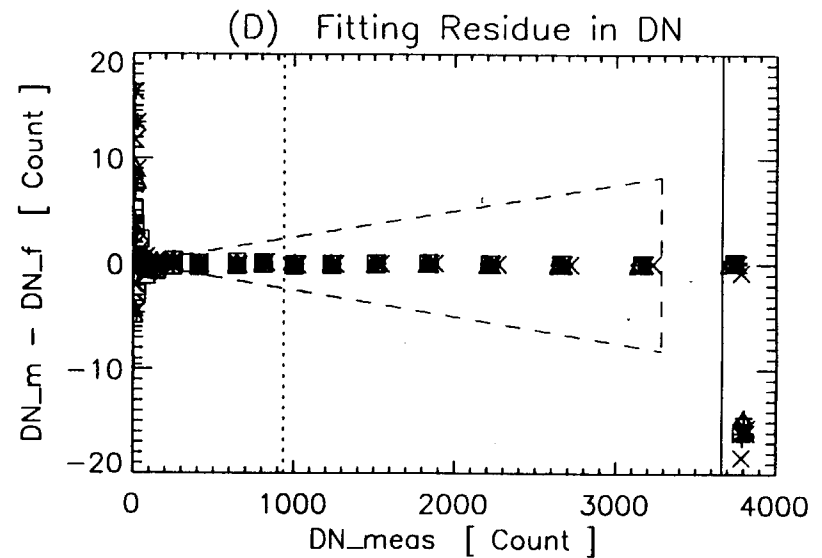
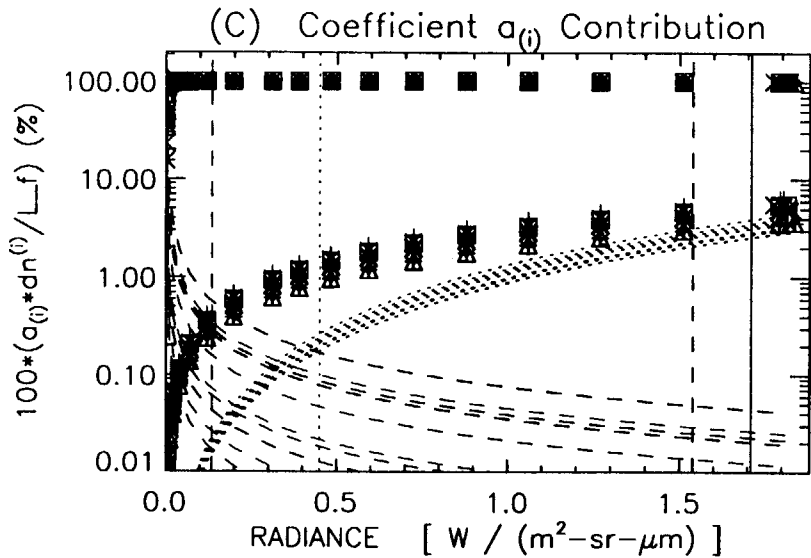
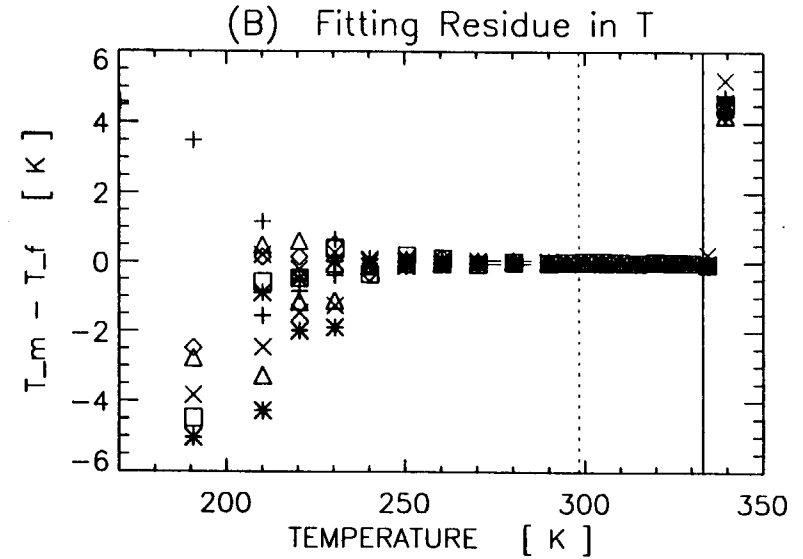
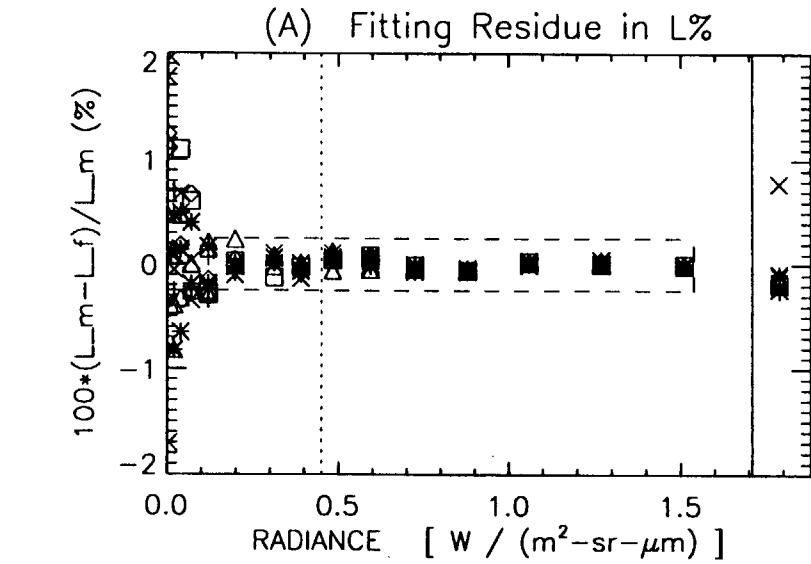
(D) Fitting Residue in DN



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.45 (Grn Dotted Line); Lmax = 1.71 (Red Solid Line)  
 0.3Ltyp = 0.14; 0.9Lmax = 1.54 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 240 (K) – 330 (K)  
 0.05Ltyp – 0.89Lmax

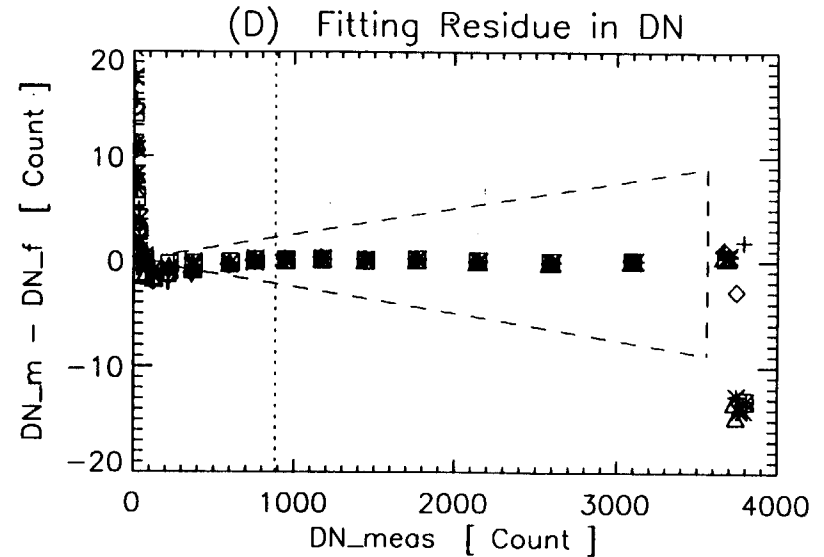
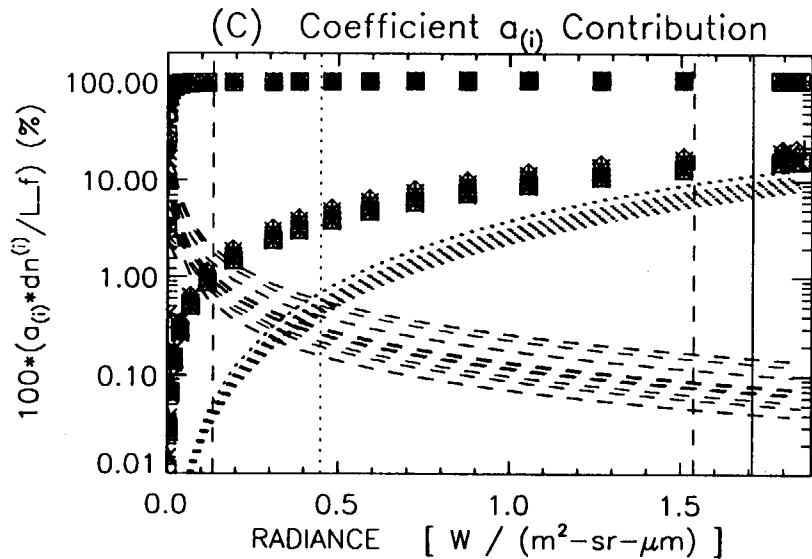
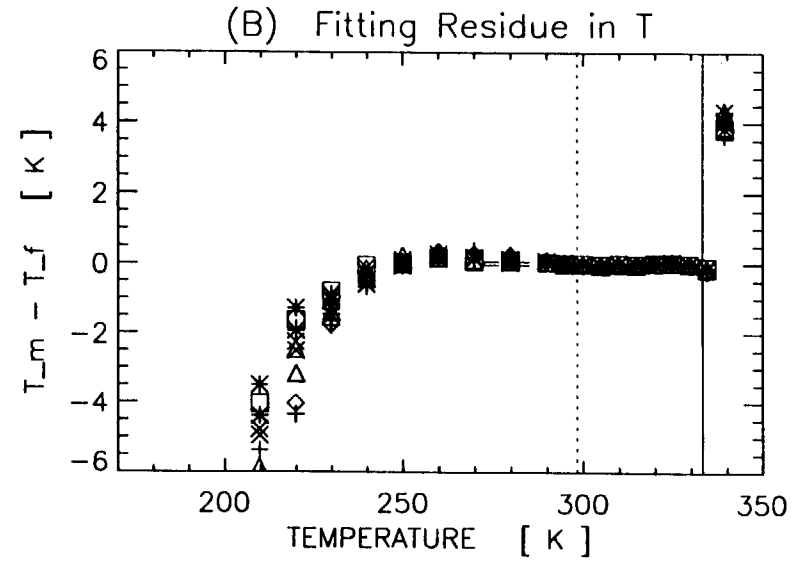
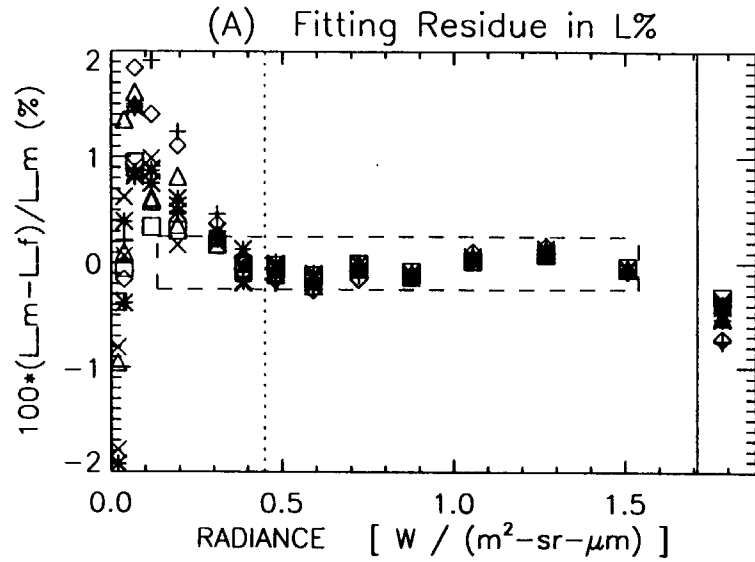
B20 L vs DN Cubic Fitting; Hot Plateau (283 K); UAID: 1402 - 1426



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.45 (Grn Dotted Line); Lmax = 1.71 (Red Solid Line)  
 0.3Ltyp = 0.14; 0.9Lmax = 1.54 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 240 (K) - 330 (K)  
 0.05Ltyp - 0.88Lmax

B20 L vs DN Cubic Fitting; Cold Plateau (256 K); UAID: 1315 - 1337

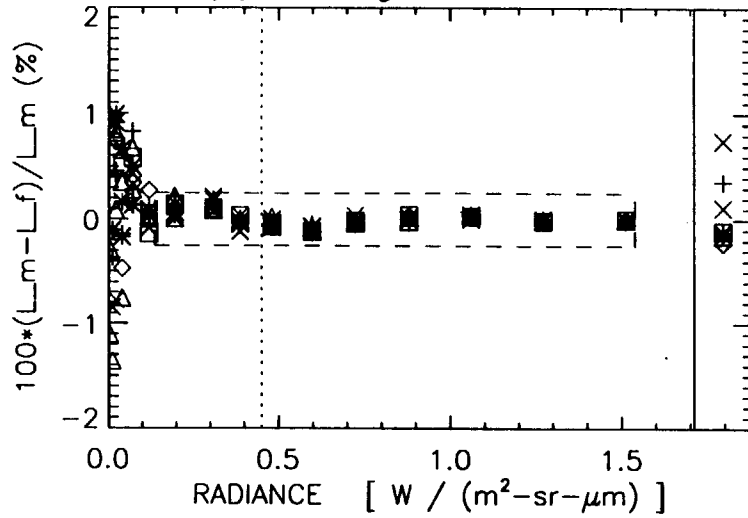


Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ    Ch5: Red ◇  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*    Ch10: Red Δ  
 Ltyp = 0.45 (Grn Dotted Line);    Lmax = 1.71 (Red Solid Line)  
 0.3Ltyp = 0.14;    0.9Lmax = 1.54 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D):    (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

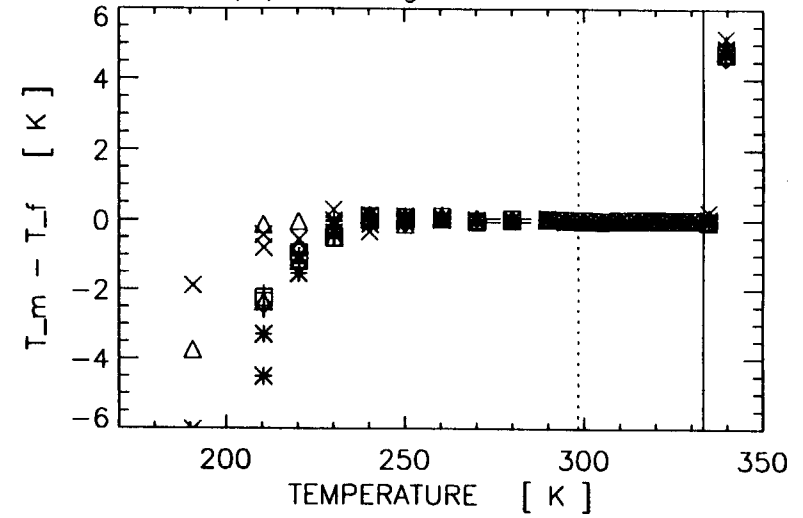
Fitting Range: 220 (K) - 330 (K)  
 0.01Ltyp - 0.88Lmax

B20 L vs DN Cubic Fitting; Nominal Plateau 1 (273 K); UAID: 1506 – 1526

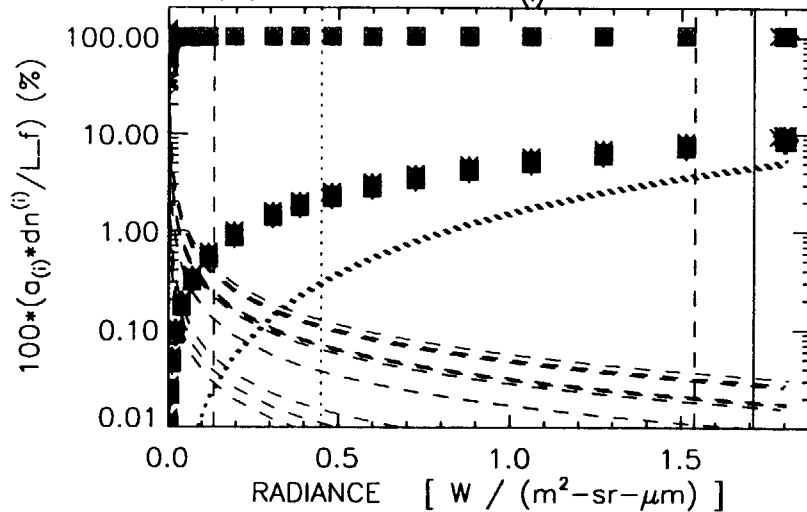
(A) Fitting Residue in L%



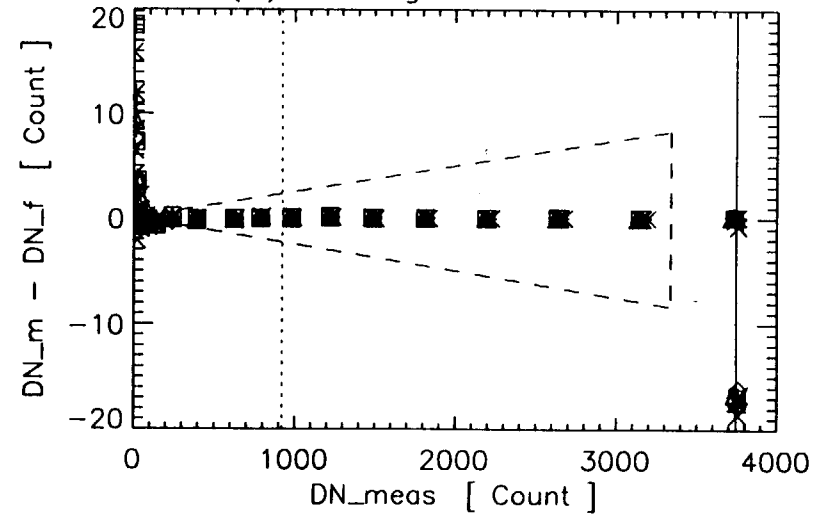
(B) Fitting Residue in T



(C) Coefficient  $a_{(i)}$  Contribution



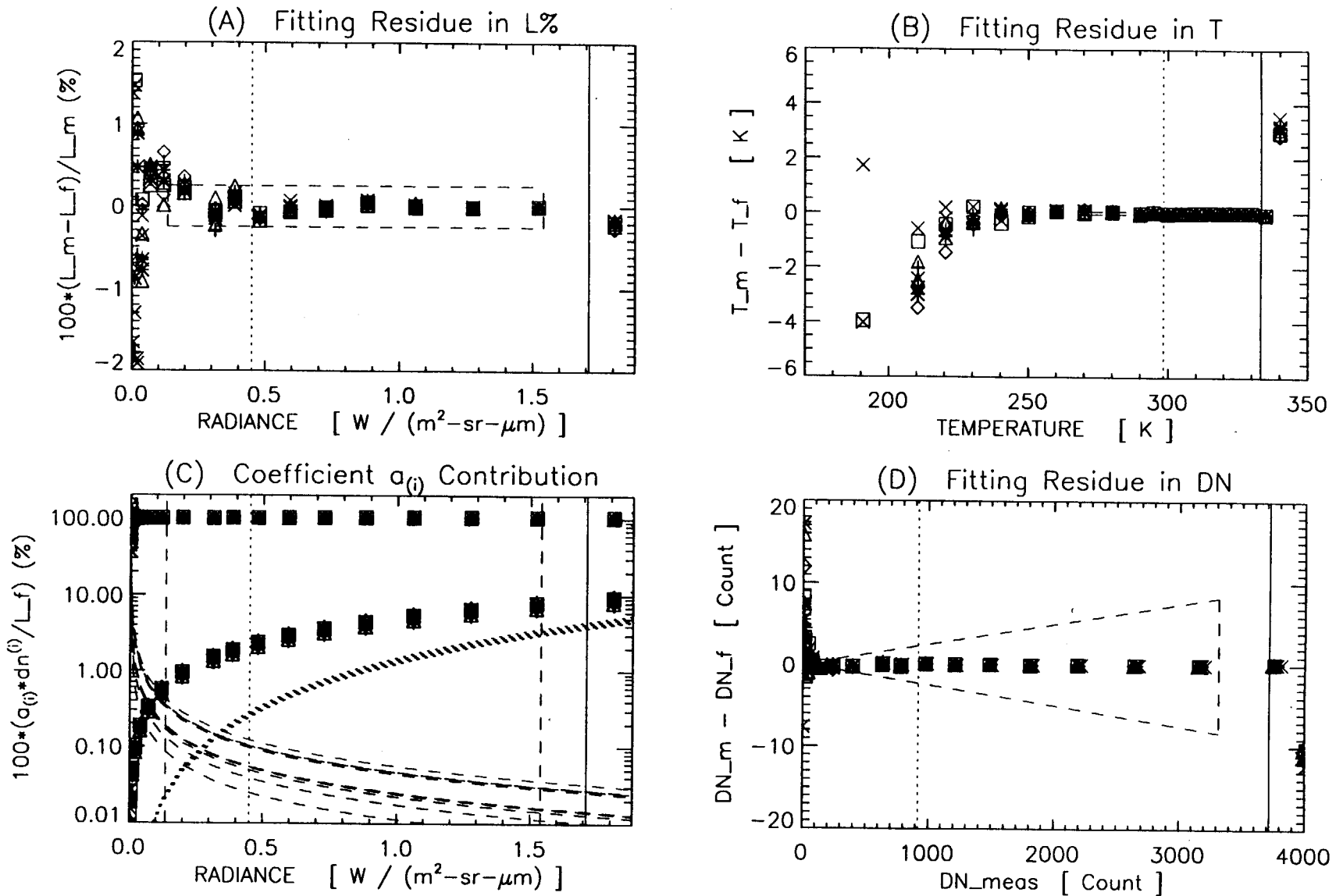
(D) Fitting Residue in DN



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.45 (Grn Dotted Line); Lmax = 1.71 (Red Solid Line)  
 0.3Ltyp = 0.14; 0.9Lmax = 1.54 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 220 (K) – 330 (K)  
 0.01Ltyp – 0.88Lmax

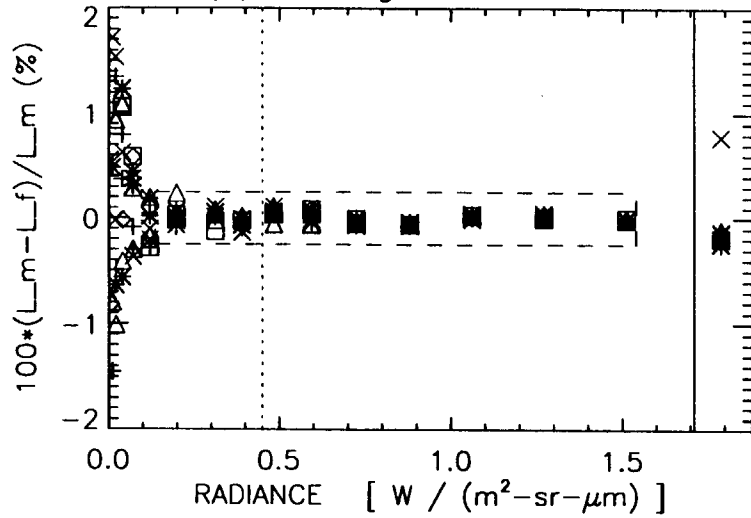
B20 L vs DN Cubic Fitting; Nominal Plateau 2 (273 K); UAID: 1595 - 1618



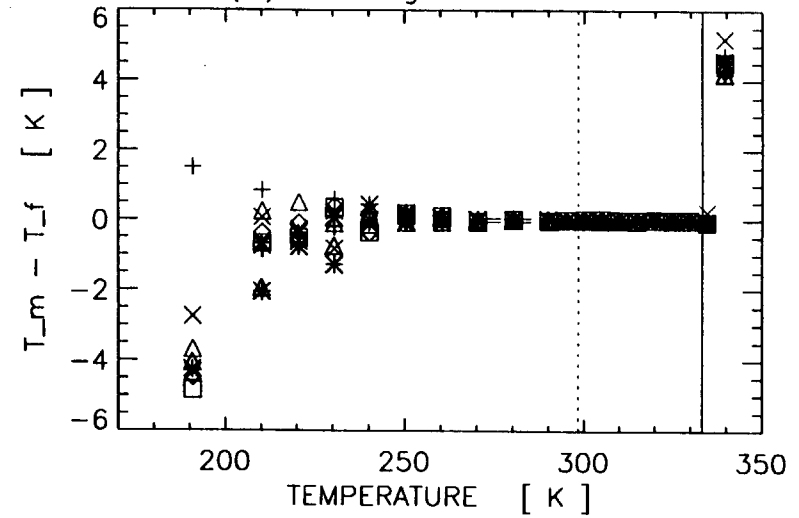
Fitting Range: 220 (K) - 330 (K)  
 0.01Ltyp - 0.89Lmax

B20 L vs DN Cubic Fitting; Hot Plateau (283 K); UAID: 1402 – 1426

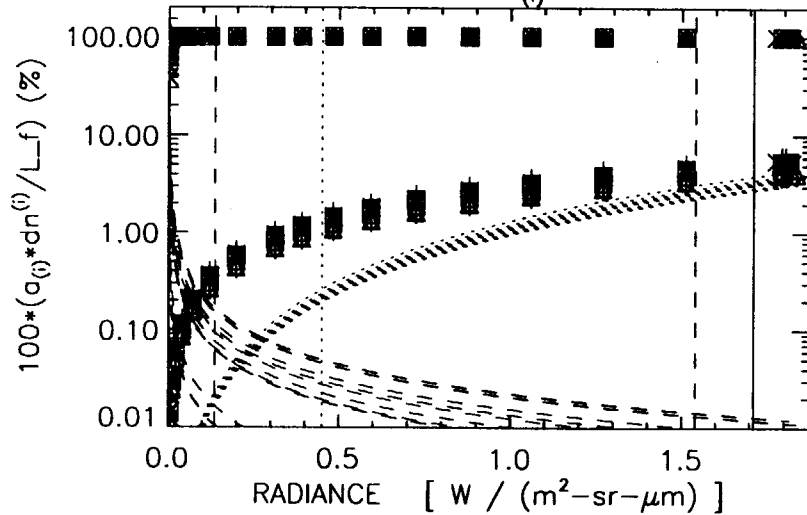
(A) Fitting Residue in L%



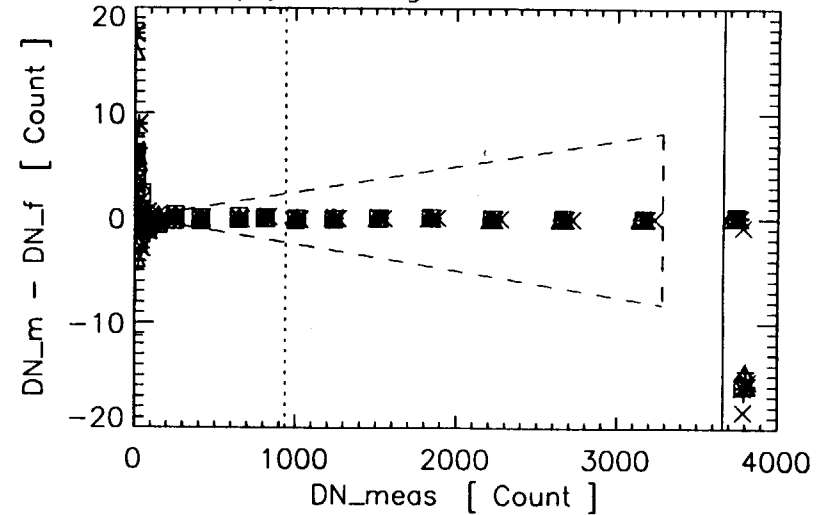
(B) Fitting Residue in T



(C) Coefficient  $a_{(i)}$  Contribution



(D) Fitting Residue in DN



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.45 (Grn Dotted Line); Lmax = 1.71 (Red Solid Line)  
 0.3Ltyp = 0.14; 0.9Lmax = 1.54 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

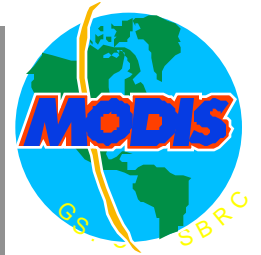
Fitting Range: 220 (K) - 330 (K)  
 0.01Ltyp - 0.88Lmax





# Band 21 Calibration Fitting Summary

(Caution: Band 21 Calibrated to 0.03 Lmax)



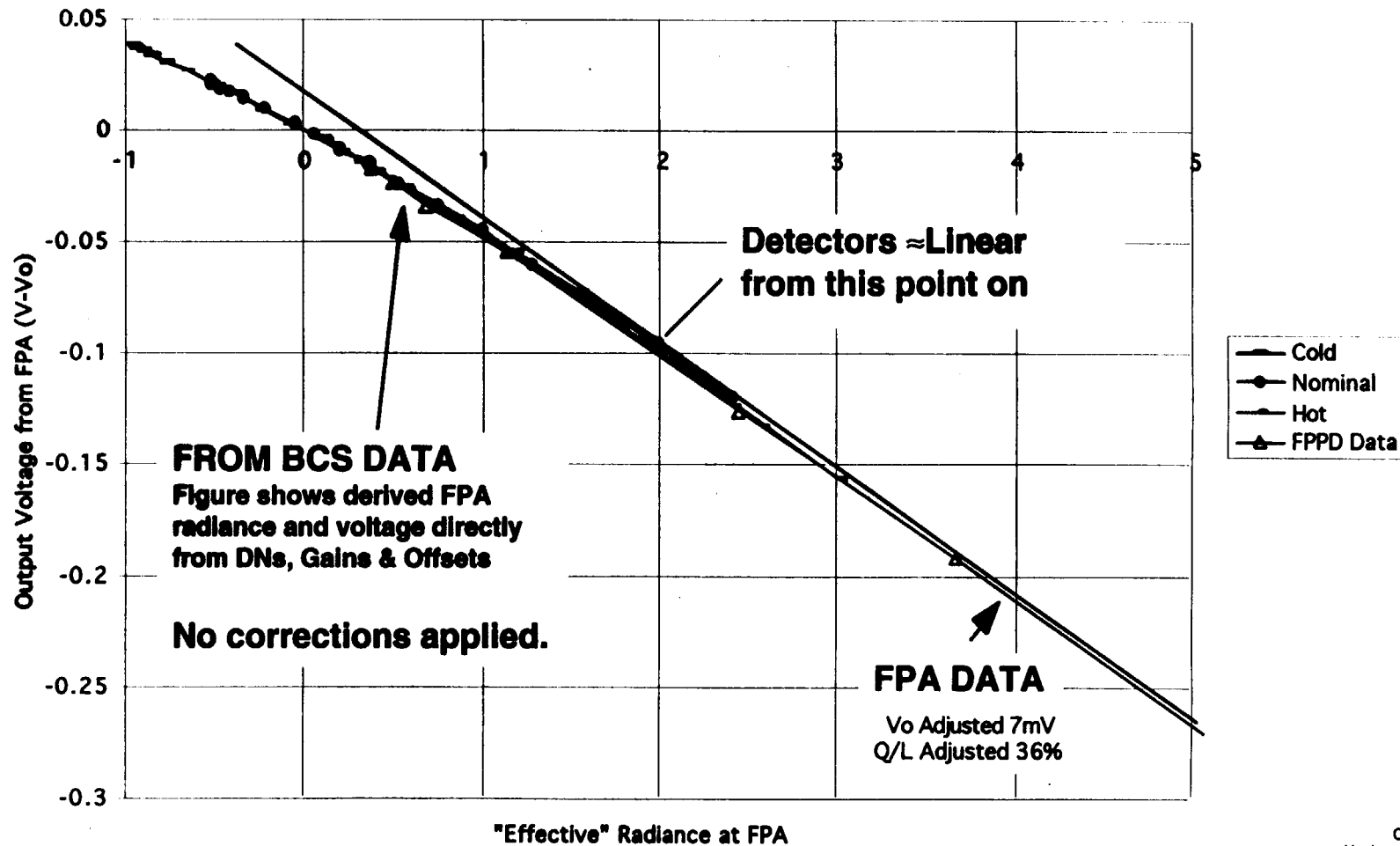
Instrument Temperature	# of BCS levels used	Cold Plateau (256K)	Nominal 1 (273K)	Nominal 2 (273K)	Hot Plateau (283K)
Quadratic Fitting (260 K - 340 K)	14				



# BAND 21 DATA NONLINEAR DUE TO LOW SIGNAL OUTPUT IN ROIC



Master Curve for Band 21 Test Case



PRELIMINARY

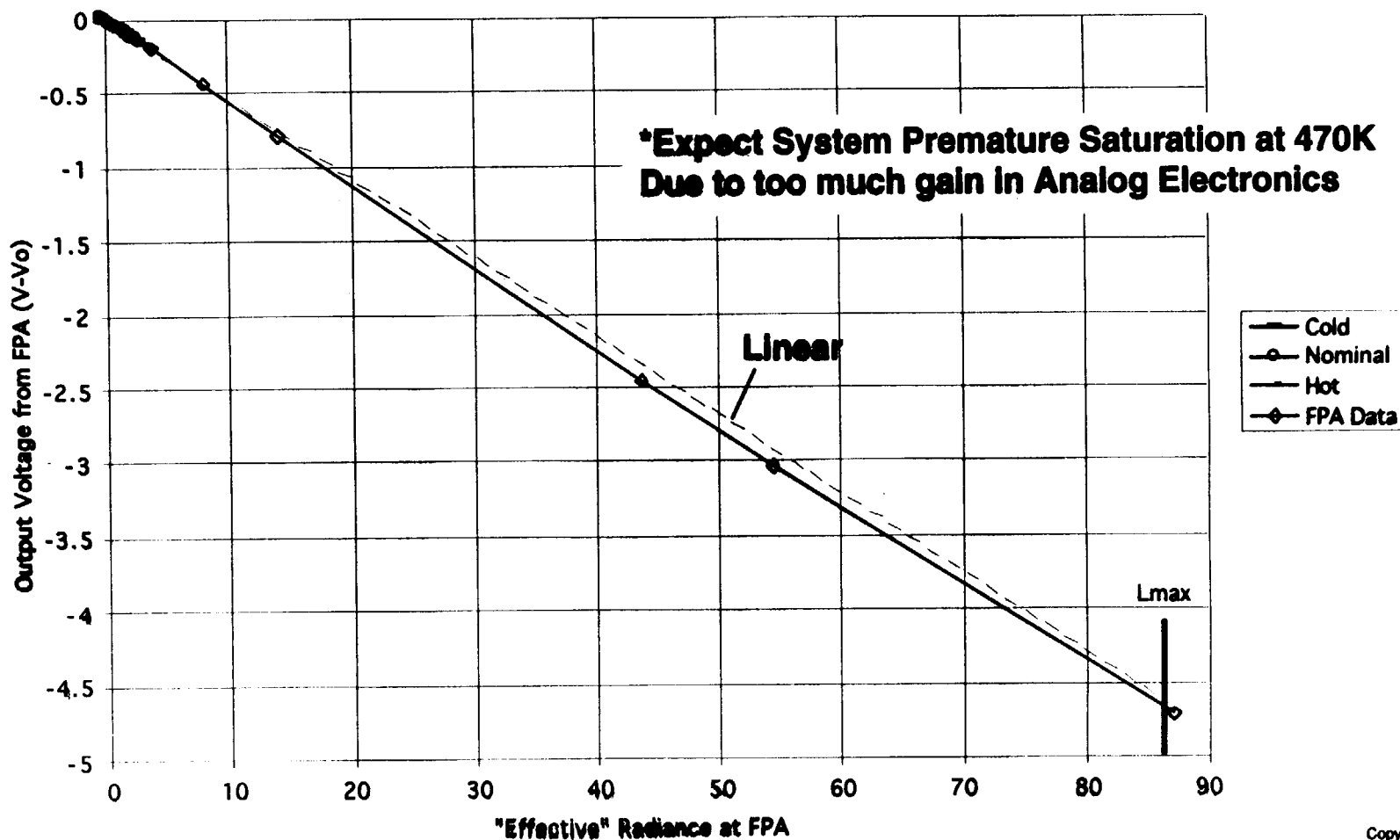
5-50



# FPA COMPONENT DATA DEMONSTRATES DETECTOR OPERATION TO SATURATION\*



FPPD Data Overlaid with System BCS Data

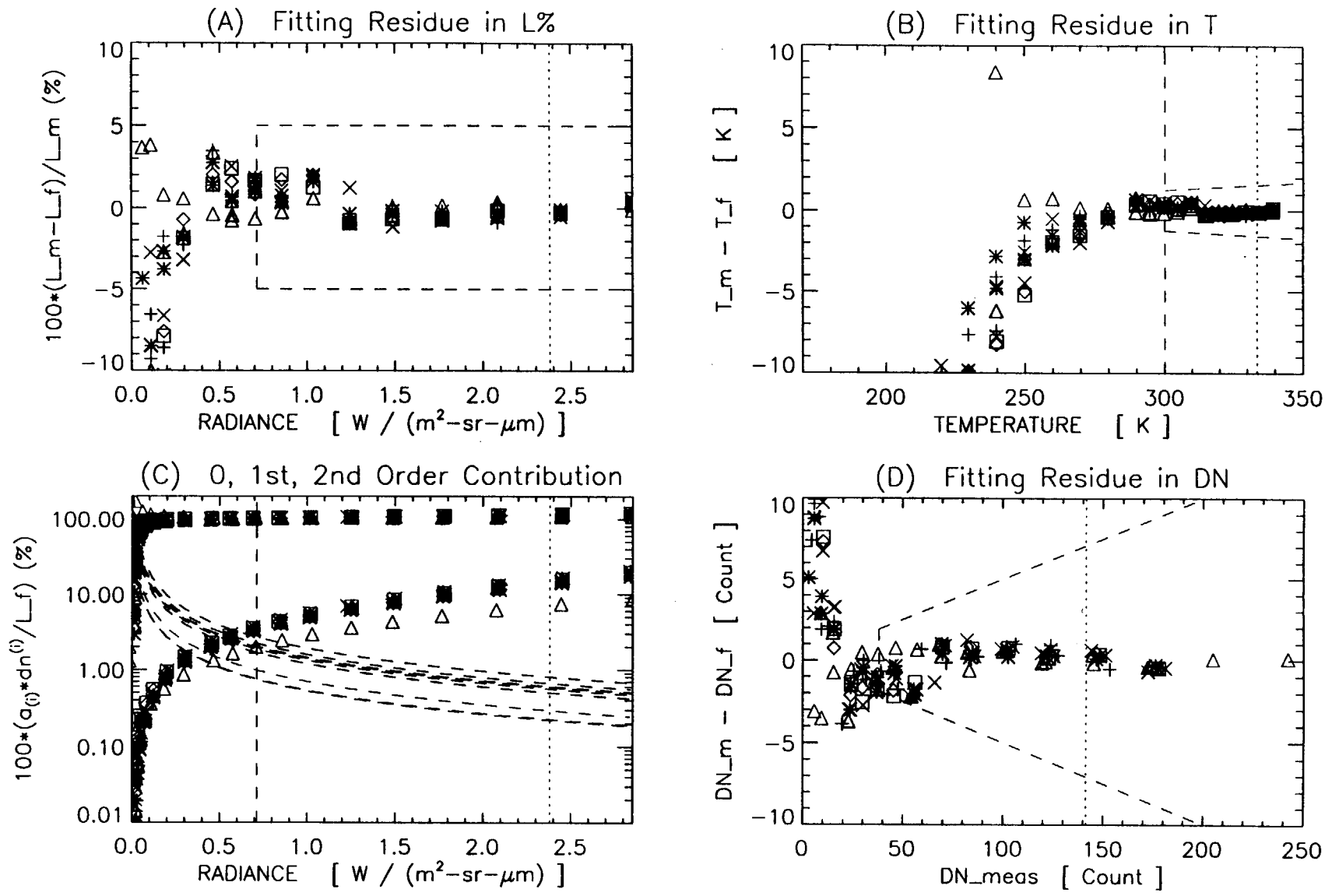


PRELIMINARY

5-51

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Santa Barbara Remote Sensing  
An unpublished work. All rights reserved.

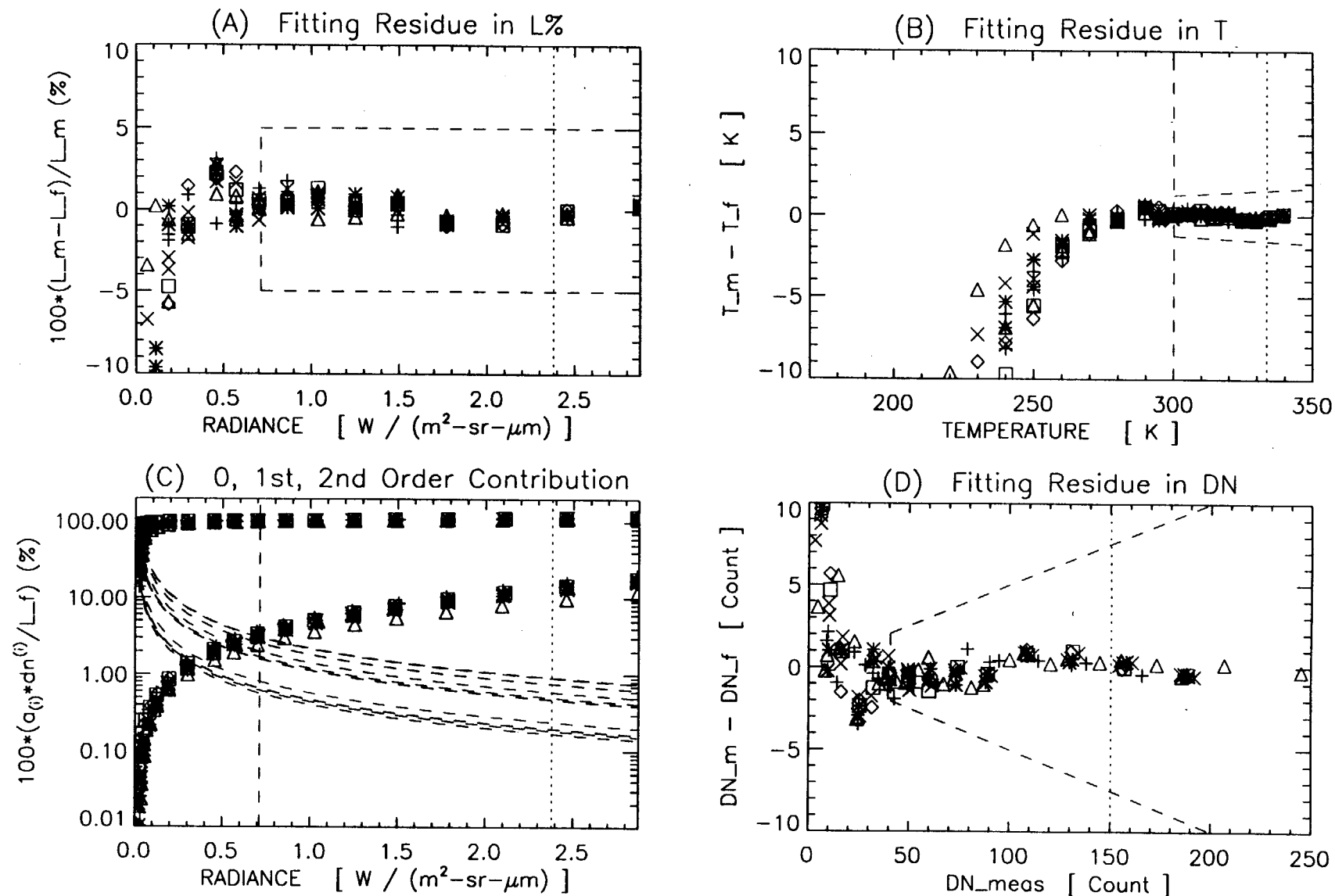
B21 L vs DN Quadratic Fitting; Cold Plateau (256 K); UAID: 1315 – 1337



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 2.38 (Grn Dotted Line); Lmax = 86.0 (Red Solid Line)  
 0.3Ltyp = 0.71; 0.9Lmax = 77.4 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 260 (K) – 340 (K)  
 0.05Ltyp – 0.03Lmax

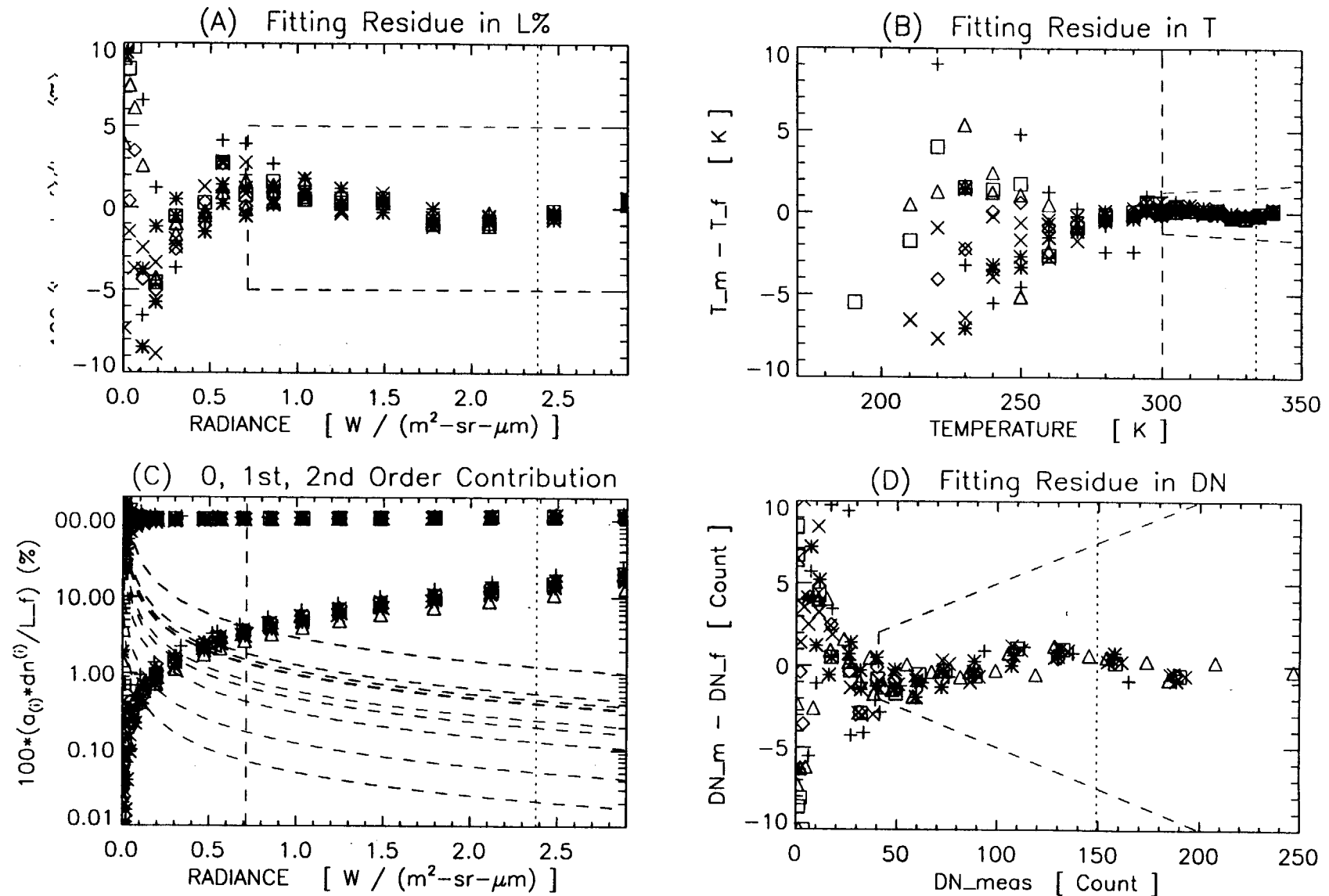
B21 L vs DN Quadratic Fitting; Nominal Plateau 1 (273 K); UAID: 1506 – 1526



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 2.38 (Grn Dotted Line); Lmax = 86.0 (Red Solid Line)  
 0.3Ltyp = 0.71; 0.9Lmax = 77.4 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp – 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 260 (K) – 340 (K)  
 0.05Ltyp – 0.03Lmax

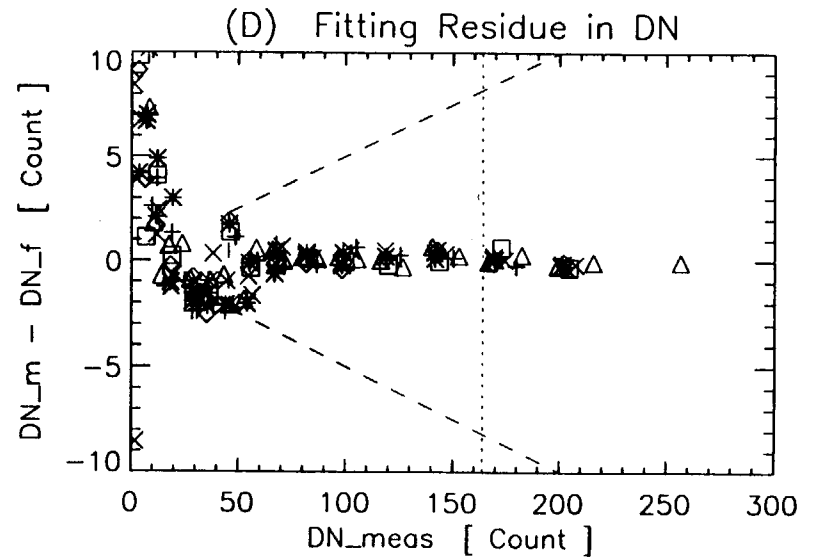
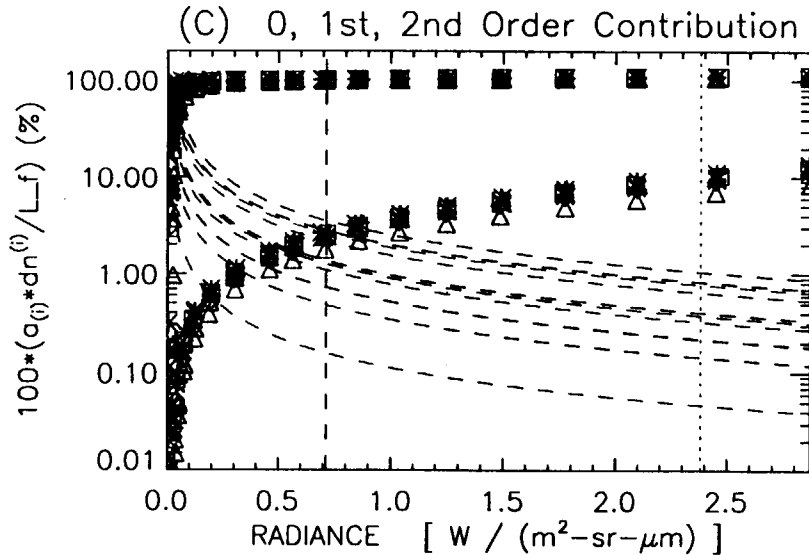
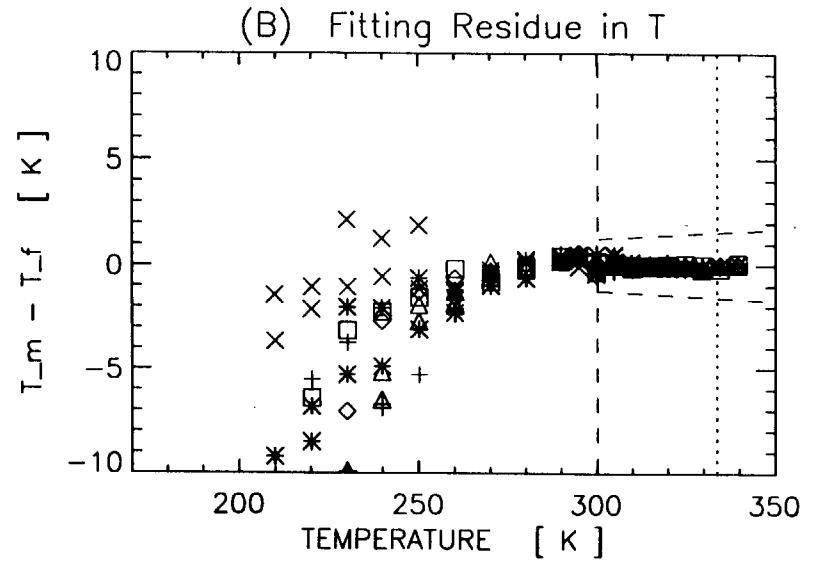
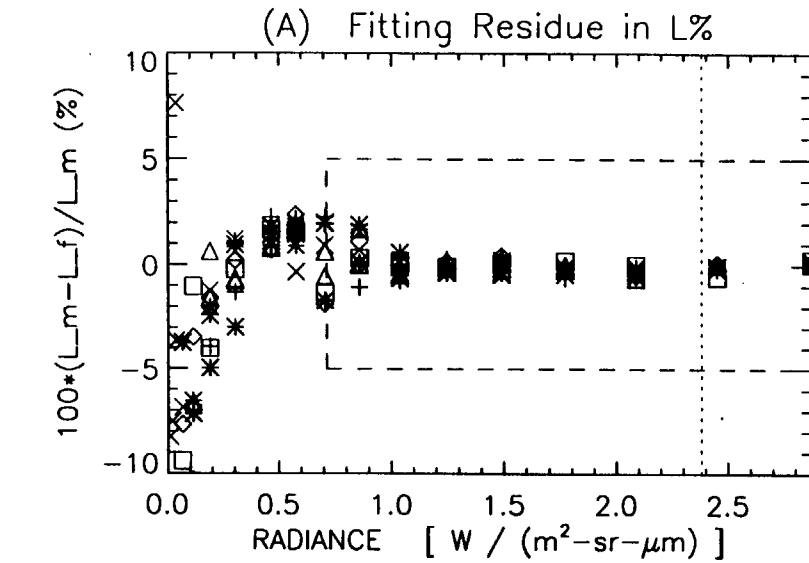
B21 L vs DN Quadratic Fitting; Nominal Plateau 2 (273 K); UAID: 1595 - 1618



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 L<sub>typ</sub> = 2.38 (Grn Dotted Line); L<sub>max</sub> = 86.0 (Red Solid Line)  
 0.3L<sub>typ</sub> = 0.71; 0.9L<sub>max</sub> = 77.4 (Red Dashed Line)  
 Dashd Line Box (Plots A,B,D): (0.3L<sub>typ</sub> - 0.9L<sub>max</sub>) × ±1/2 Goal\*

Fitting Range: 260 (K) - 340 (K)  
 0.05L<sub>typ</sub> - 0.03L<sub>max</sub>

B21 L vs DN Quadratic Fitting; Hot Plateau (283 K); UAID: 1402 - 1426



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 2.38 (Grn Dotted Line); Lmax = 86.0 (Red Solid Line)  
 0.3Ltyp = 0.71; 0.9Lmax = 77.4 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 260 (K) - 340 (K)  
 0.05Ltyp - 0.03Lmax



# Band 22 Calibration Fitting Summary

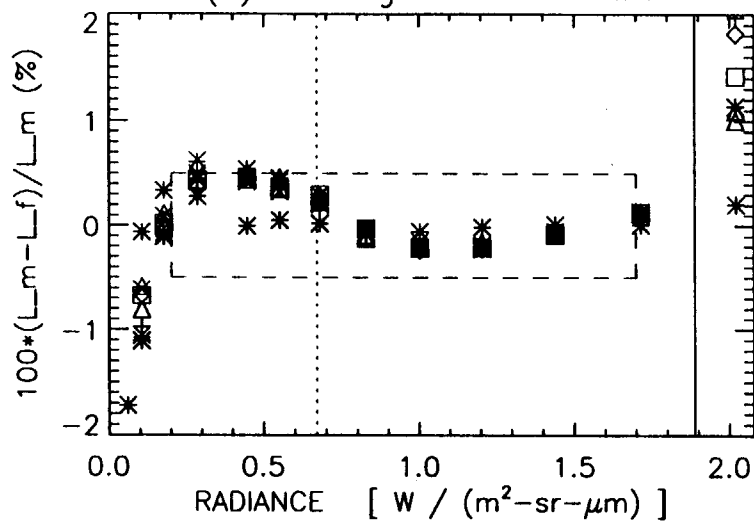


Instrument Temperature	# of BCS levels used	Cold Plateau (256K)	Nominal 1 (273K)	Nominal 2 (273K)	Hot Plateau (283K)
Quadratic Fitting (250 K - 325 K)	12				
Quadratic Fitting (220 K - 325 K)	15				
Cubic Fitting (250 K - 325 K)	12				
Cubic Fitting (220 K - 325 K)	15				

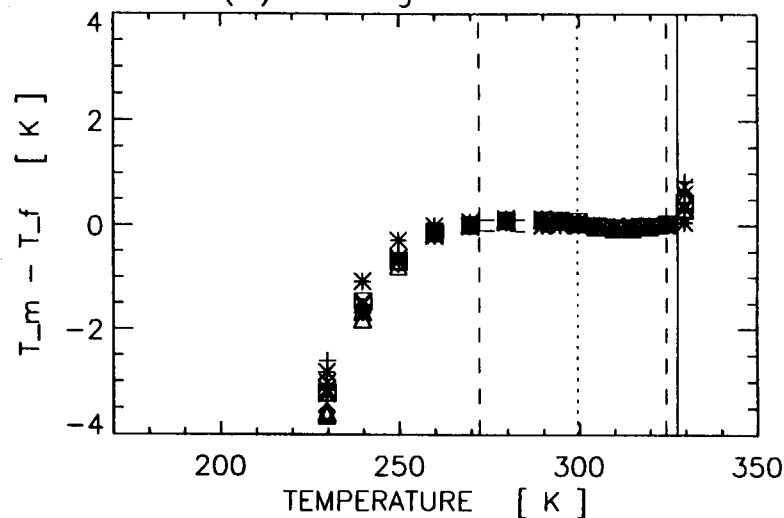


B22 L vs DN Quadratic Fitting; Cold Plateau (256 K); UAID: 1315 - 1337

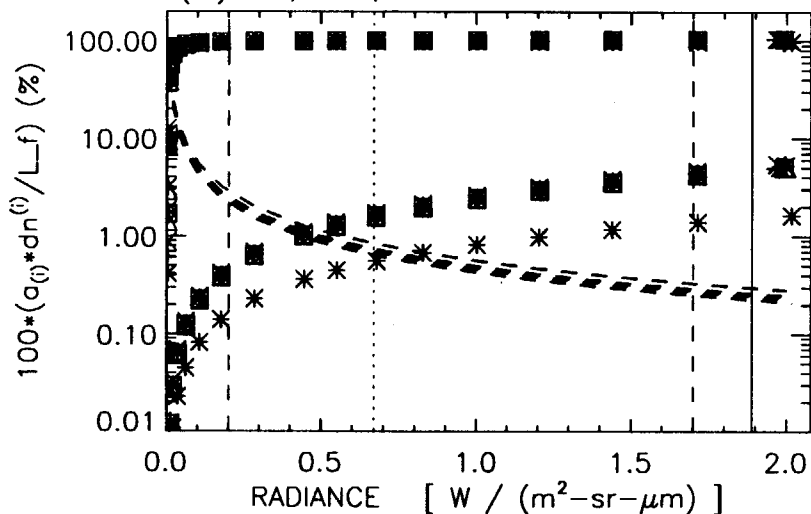
(A) Fitting Residue in L%



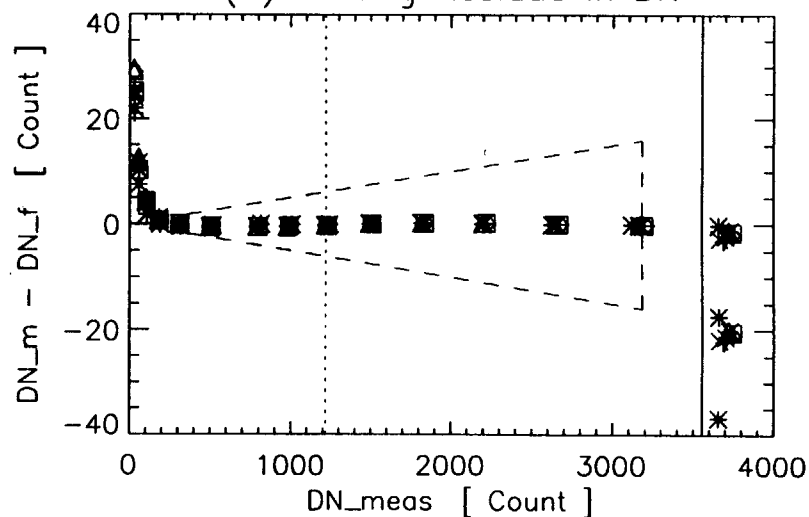
(B) Fitting Residue in T



(C) 0, 1st, 2nd Order Contribution



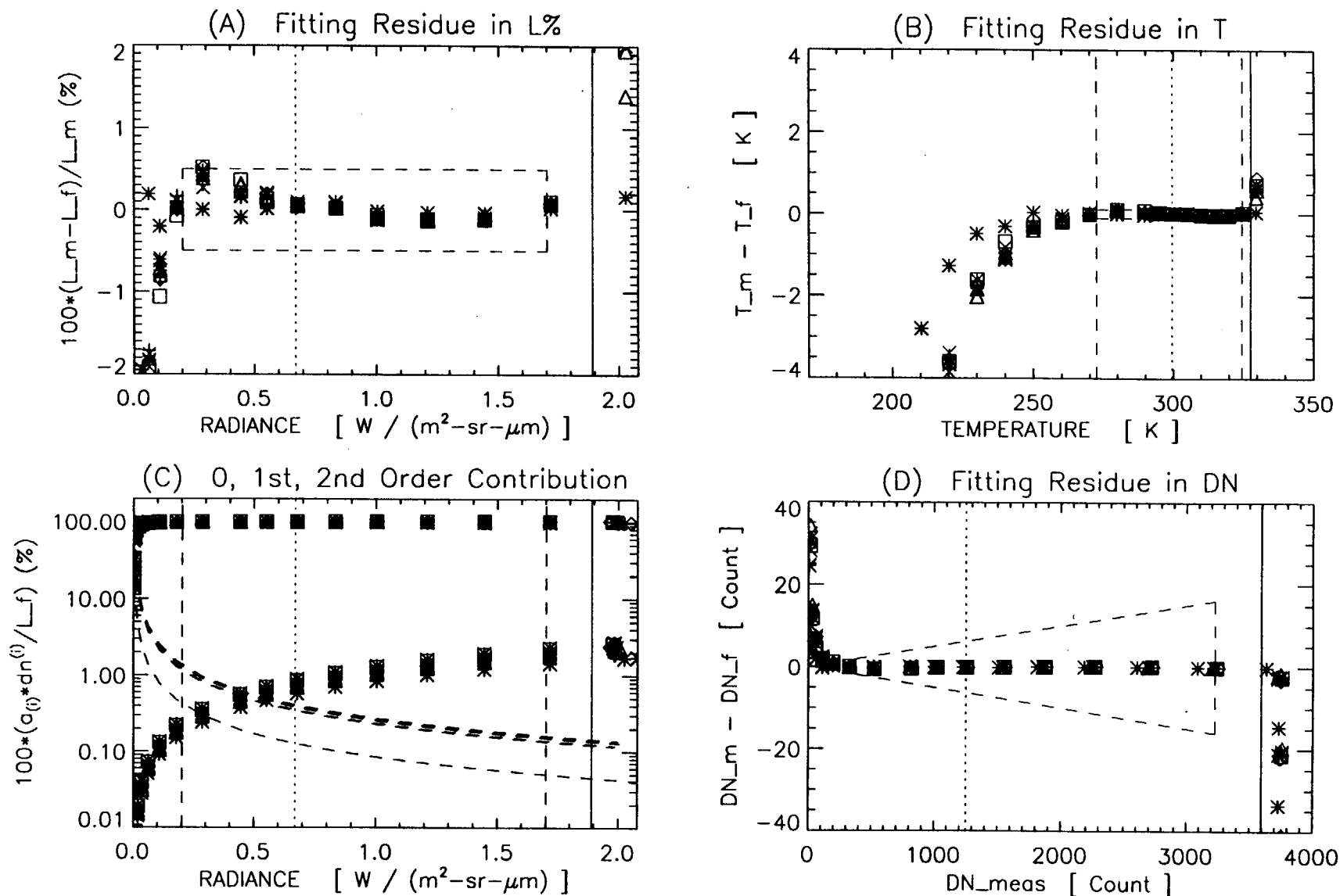
(D) Fitting Residue in DN



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.67 (Grn Dotted Line); Lmax = 1.89 (Red Solid Line)  
 0.3Ltyp = 0.20; 0.9Lmax = 1.70 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 250 (K) - 325 (K)  
 0.09Ltyp - 0.91Lmax

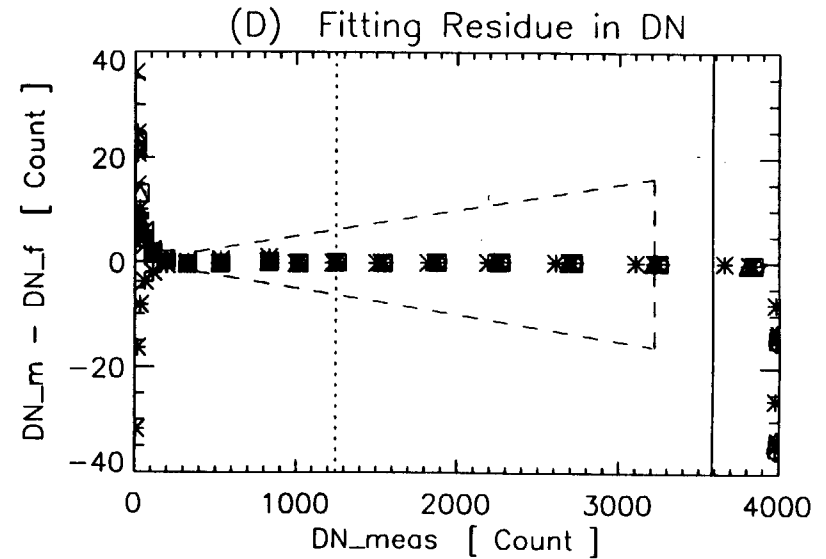
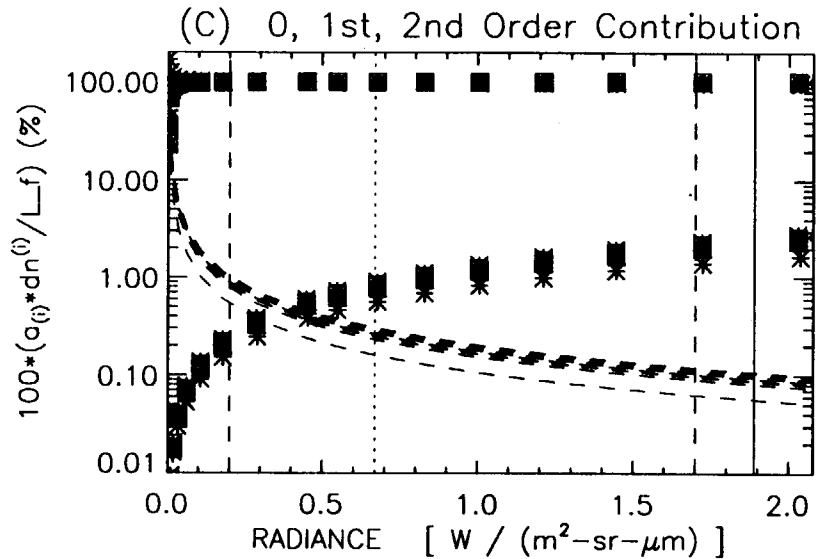
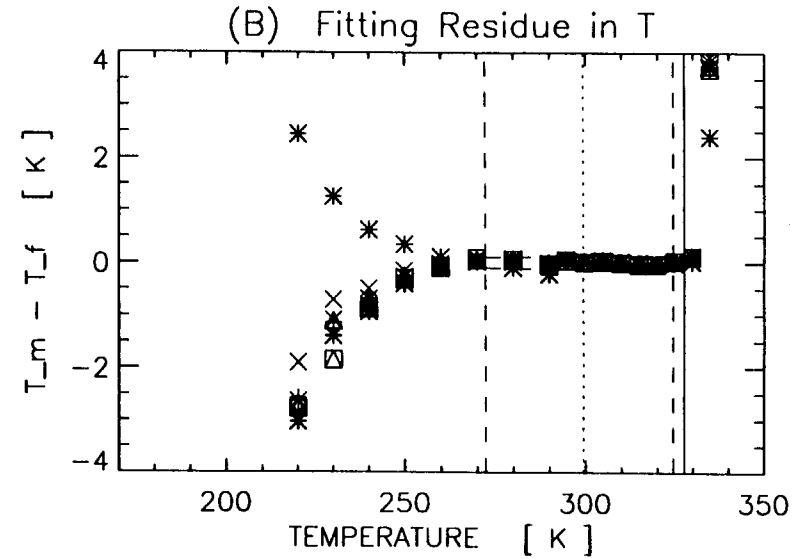
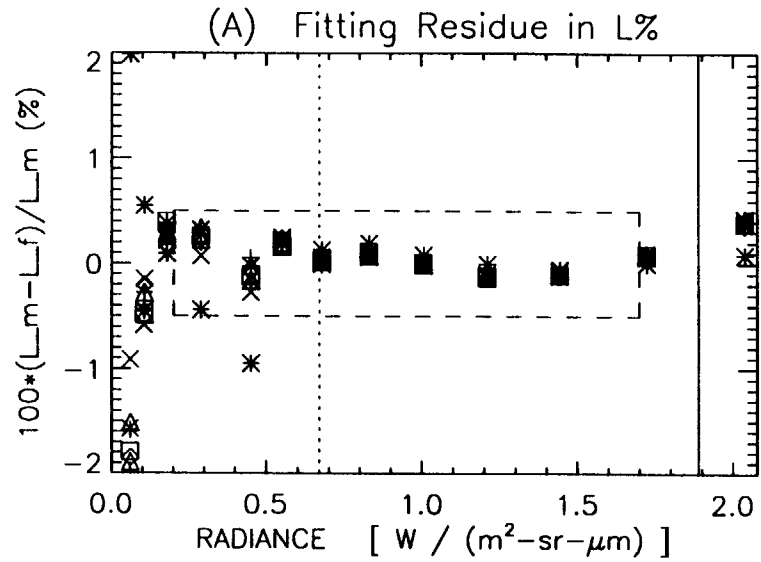
B22 L vs DN Quadratic Fitting; Nominal Plateau 1 (273 K); UAID: 1506 – 1526



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.67 (Grn Dotted Line); Lmax = 1.89 (Red Solid Line)  
 0.3Ltyp = 0.20; 0.9Lmax = 1.70 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 250 (K) – 325 (K)  
 0.09Ltyp – 0.91Lmax

B22 L vs DN Quadratic Fitting; Nominal Plateau 2 (273 K); UAID: 1595 – 1618

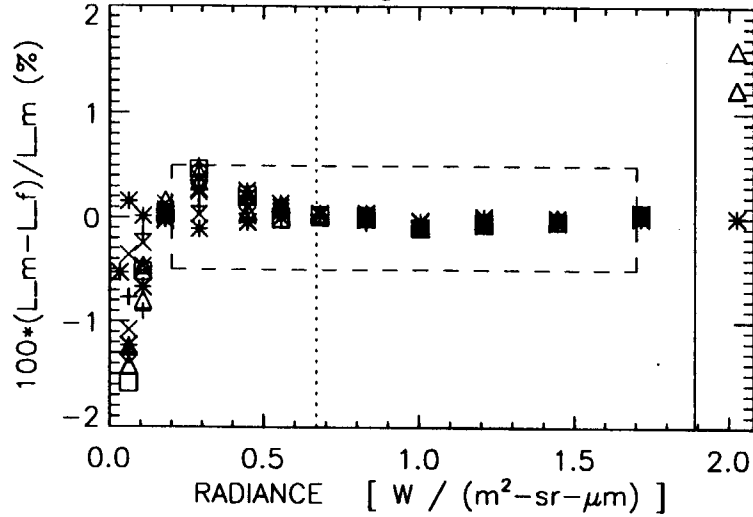


Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.67 (Grn Dotted Line); Lmax = 1.89 (Red Solid Line)  
 0.3Ltyp = 0.20; 0.9Lmax = 1.70 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

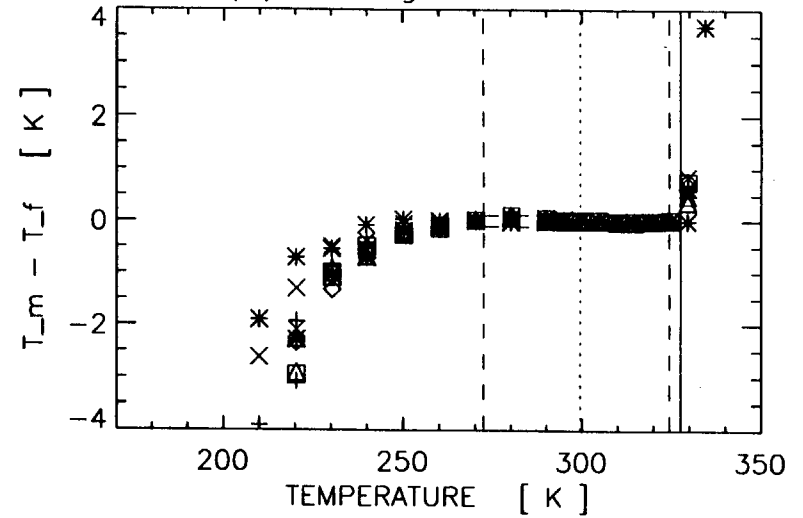
Fitting Range: 250 (K) - 325 (K)  
 0.09Ltyp - 0.91Lmax

B22 L vs DN Quadratic Fitting; Hot Plateau (283 K); UAID: 1402 - 1426

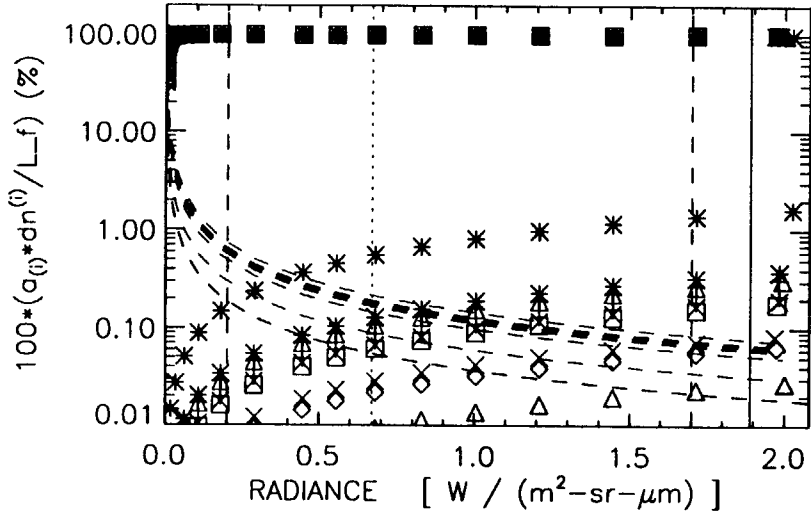
(A) Fitting Residue in L%



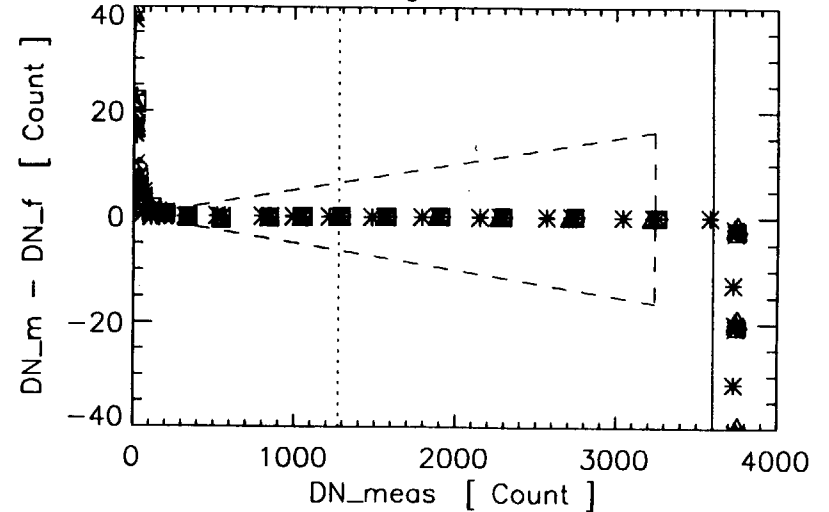
(B) Fitting Residue in T



(C) 0, 1st, 2nd Order Contribution



(D) Fitting Residue in DN

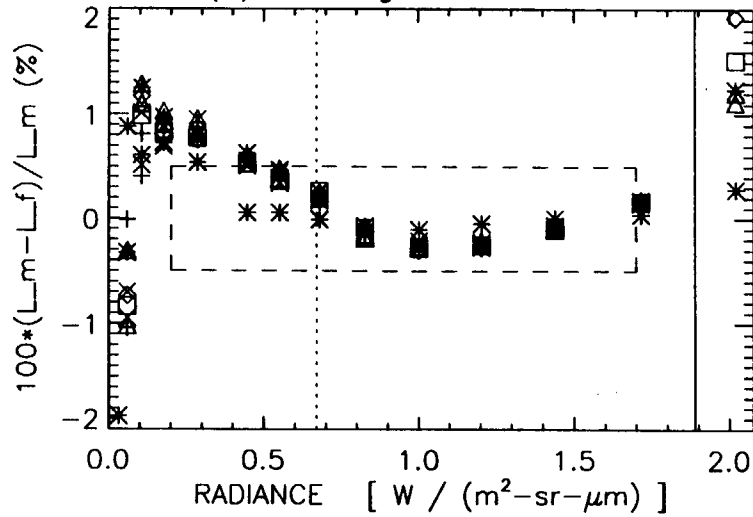


Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 L<sub>typ</sub> = 0.67 (Grn Dotted Line); L<sub>max</sub> = 1.89 (Red Solid Line)  
 0.3L<sub>typ</sub> = 0.20; 0.9L<sub>max</sub> = 1.70 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3L<sub>typ</sub> - 0.9L<sub>max</sub>) × ±1/2 Goal\*

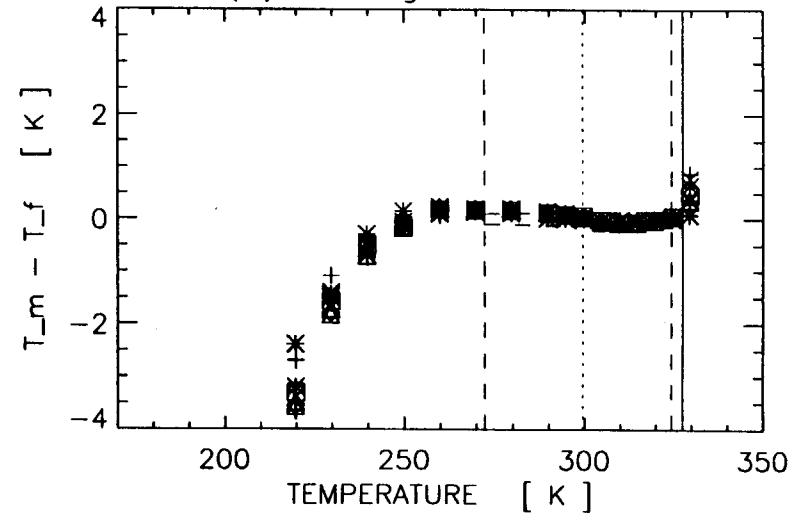
Fitting Range: 250 (K) - 325 (K)  
 0.09L<sub>typ</sub> - 0.91L<sub>max</sub>

B22 L vs DN Quadratic Fitting; Cold Plateau (256 K); UAID: 1315 - 1337

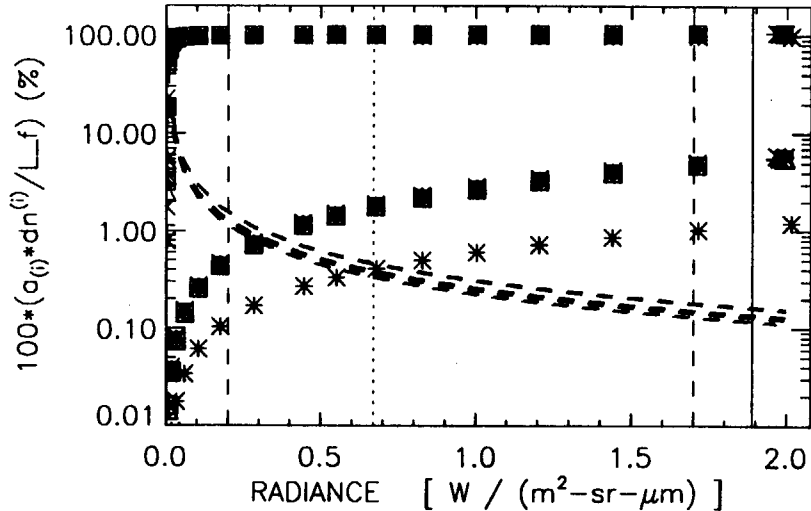
(A) Fitting Residue in L%



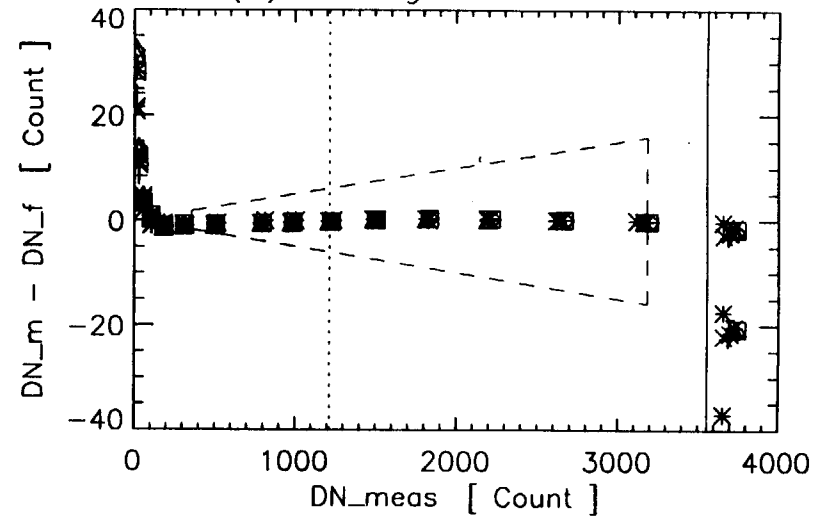
(B) Fitting Residue in T



(C) 0, 1st, 2nd Order Contribution



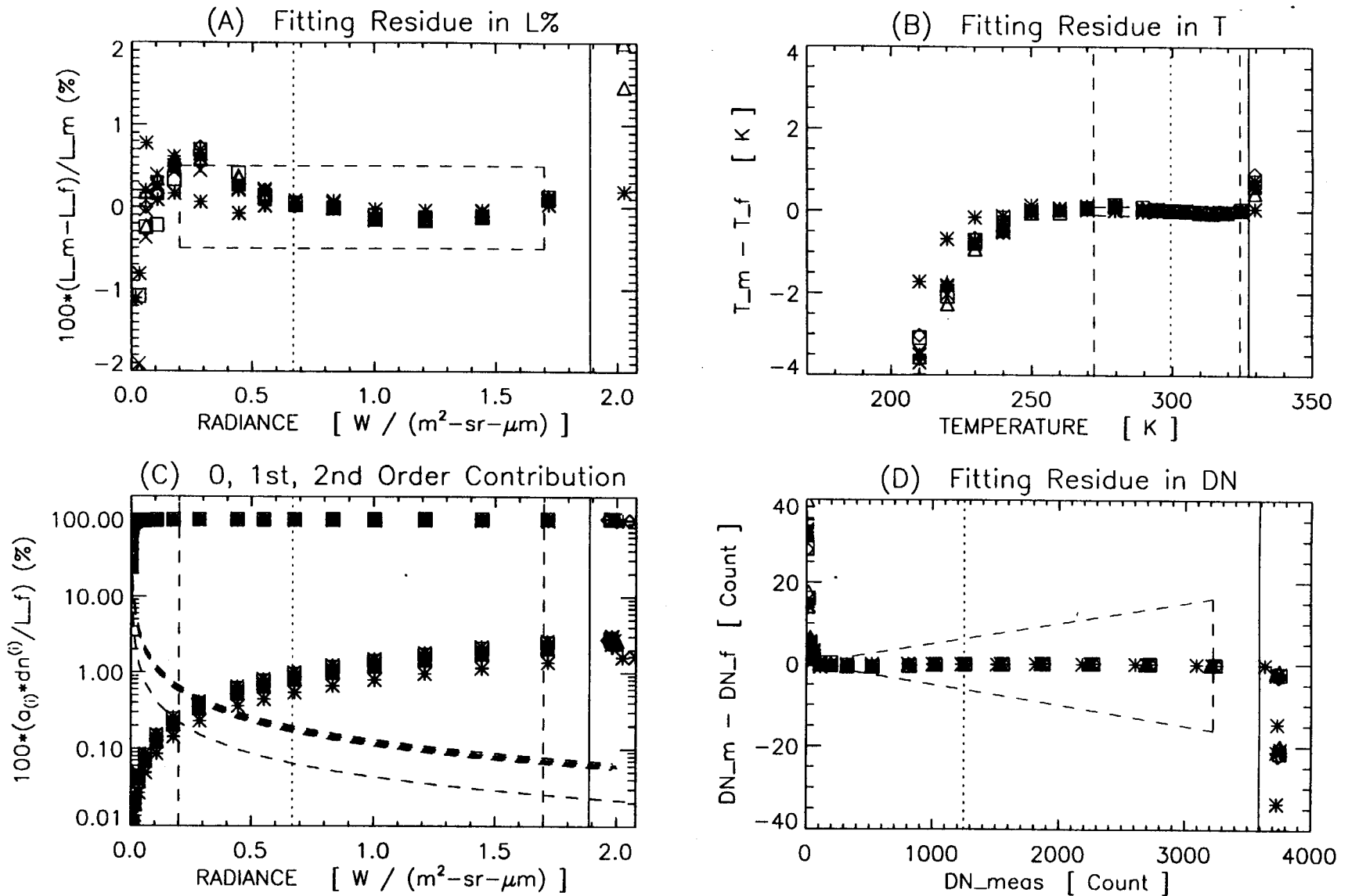
(D) Fitting Residue in DN



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 L<sub>typ</sub> = 0.67 (Grn Dotted Line); L<sub>max</sub> = 1.89 (Red Solid Line)  
 0.3L<sub>typ</sub> = 0.20; 0.9L<sub>max</sub> = 1.70 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3L<sub>typ</sub> - 0.9L<sub>max</sub>) × ±1/2 Goal\*

Fitting Range: 220 (K) - 325 (K)  
 0.01L<sub>typ</sub> - 0.91L<sub>max</sub>

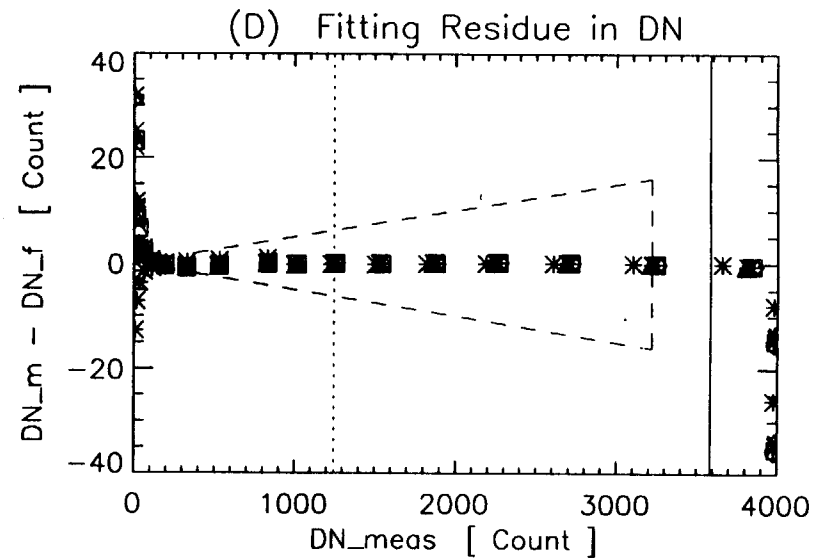
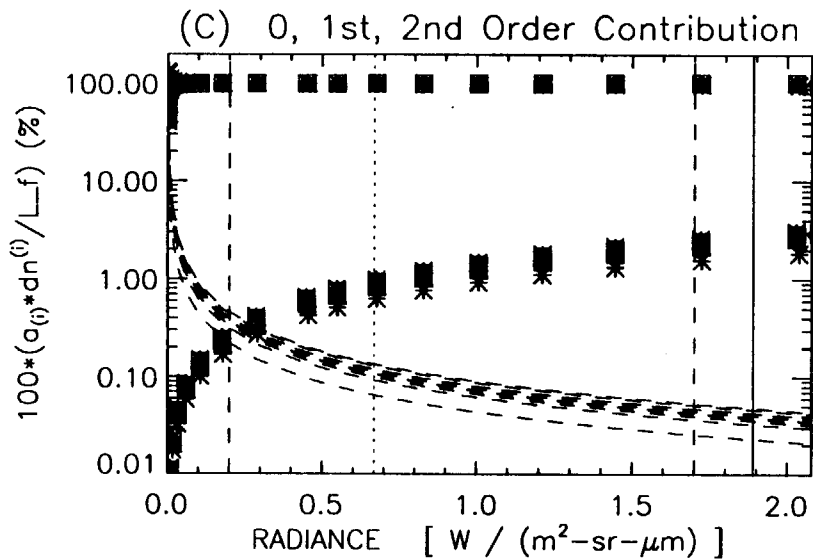
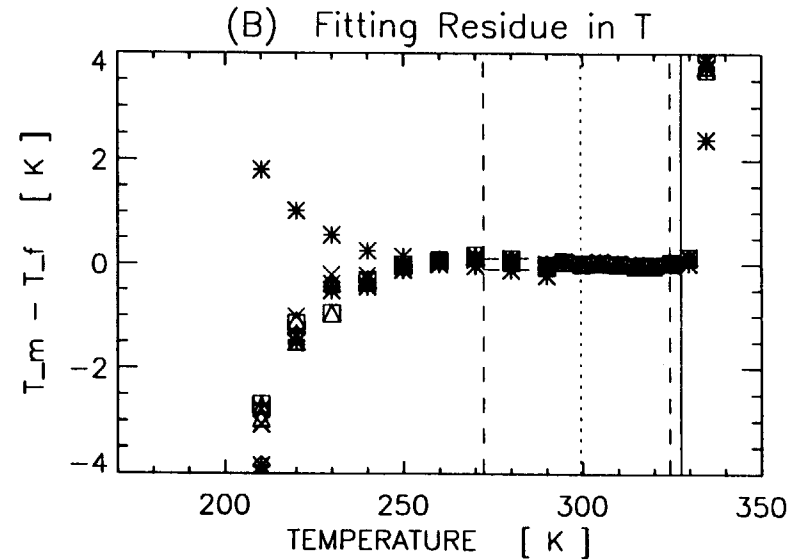
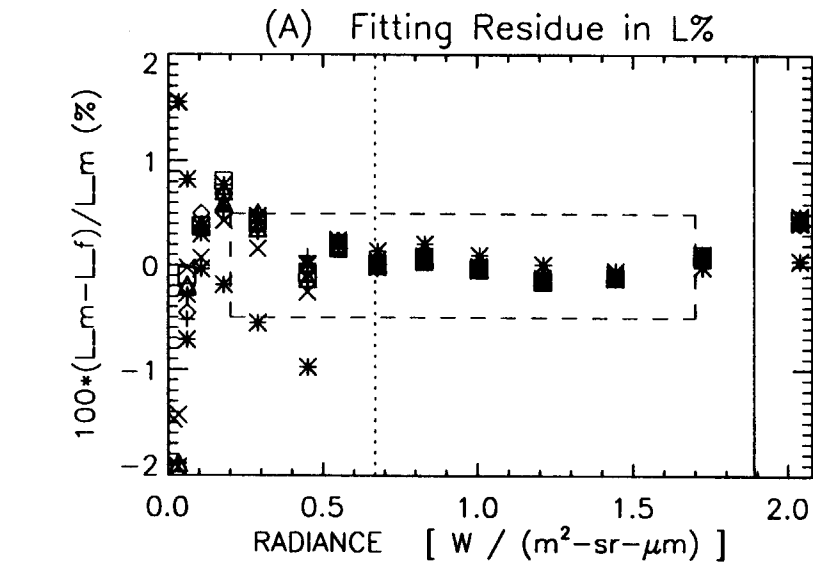
B22 L vs DN Quadratic Fitting; Nominal Plateau 1 (273 K); UAID: 1506 – 1526



Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ    Ch5: Red ◇  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*    Ch10: Red Δ  
 Ltyp = 0.67 (Grn Dotted Line);    Lmax = 1.89 (Red Solid Line)  
 0.3Ltyp = 0.20;    0.9Lmax = 1.70 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D):    (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 220 (K) - 325 (K)  
 0.01Ltyp - 0.91Lmax

B22 L vs DN Quadratic Fitting; Nominal Plateau 2 (273 K); UAID: 1595 – 1618

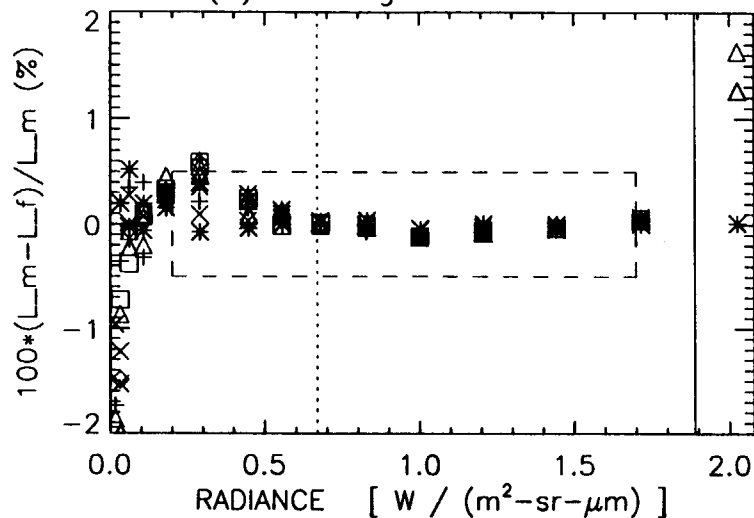


Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.67 (Grn Dotted Line); Lmax = 1.89 (Red Solid Line)  
 0.3Ltyp = 0.20; 0.9Lmax = 1.70 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

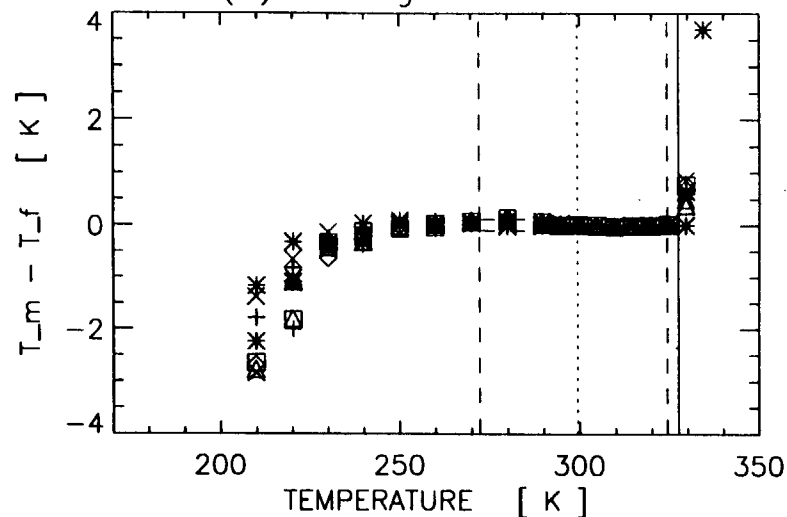
Fitting Range: 220 (K) – 325 (K)  
 0.01Ltyp – 0.91Lmax

B22 L vs DN Quadratic Fitting; Hot Plateau (283 K); UAID: 1402 - 1426

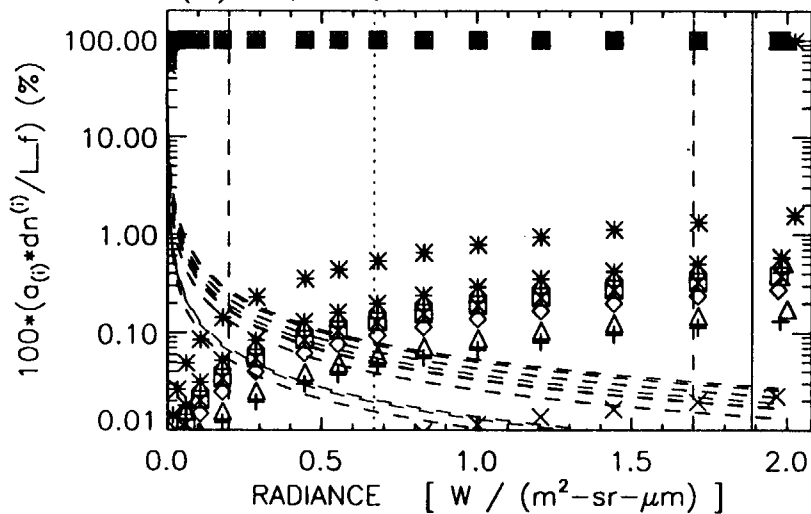
(A) Fitting Residue in L%



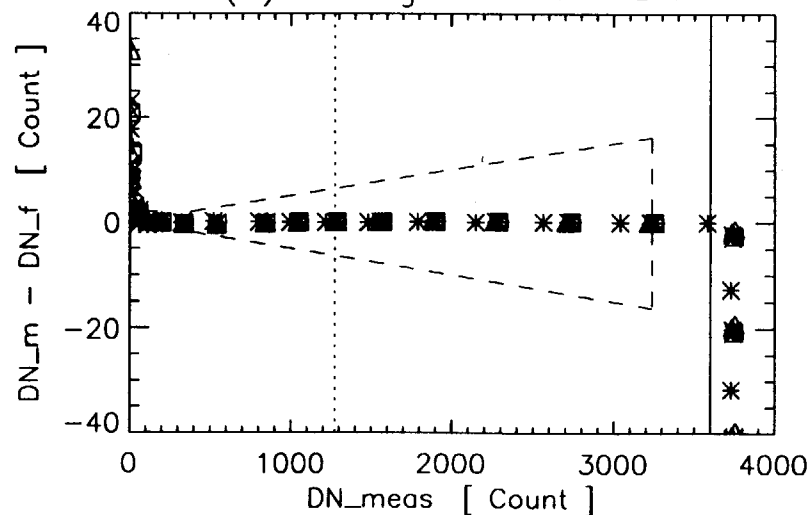
(B) Fitting Residue in T



(C) 0, 1st, 2nd Order Contribution



(D) Fitting Residue in DN



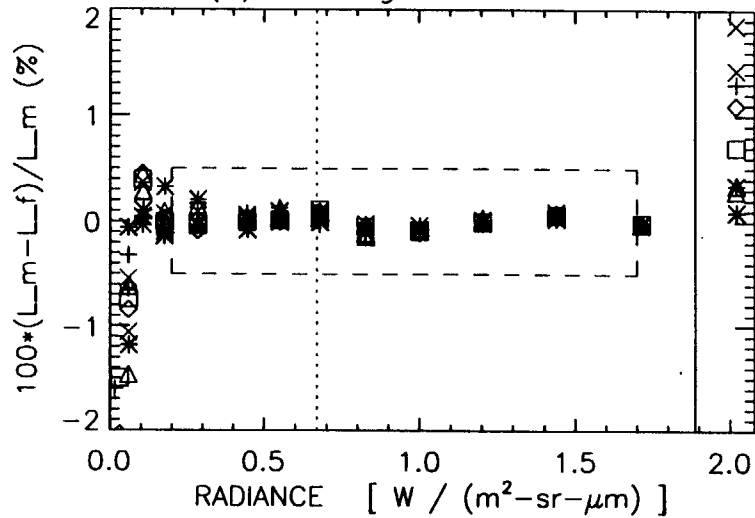
Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.67 (Grn Dotted Line); Lmax = 1.89 (Red Solid Line)  
 0.3Ltyp = 0.20; 0.9Lmax = 1.70 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 220 (K) - 325 (K)  
 0.01Ltyp - 0.91Lmax

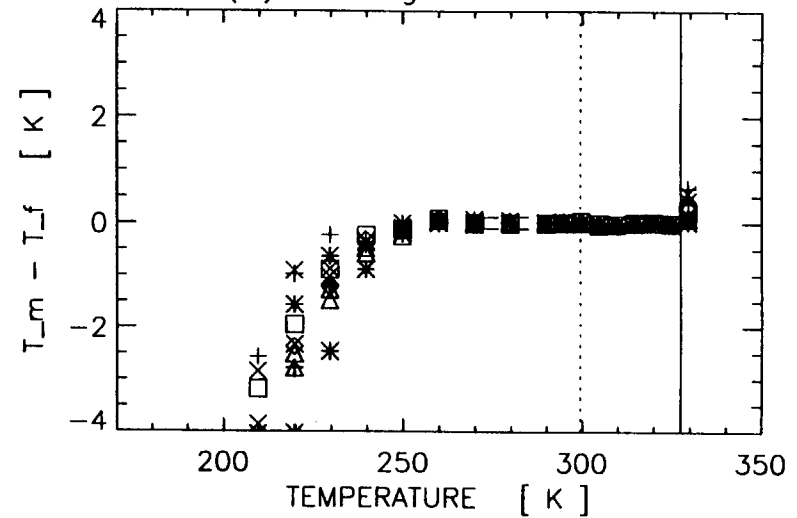


B22 L vs DN Cubic Fitting; Cold Plateau (256 K); UAID: 1315 - 1337

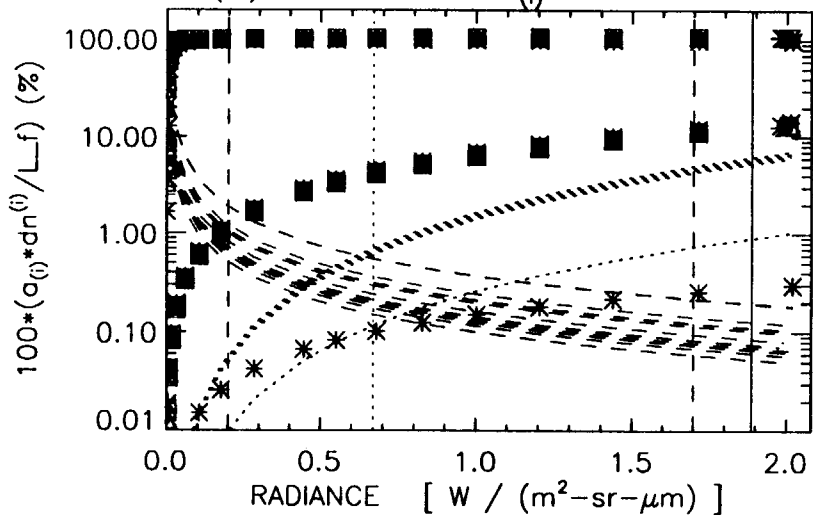
(A) Fitting Residue in L%



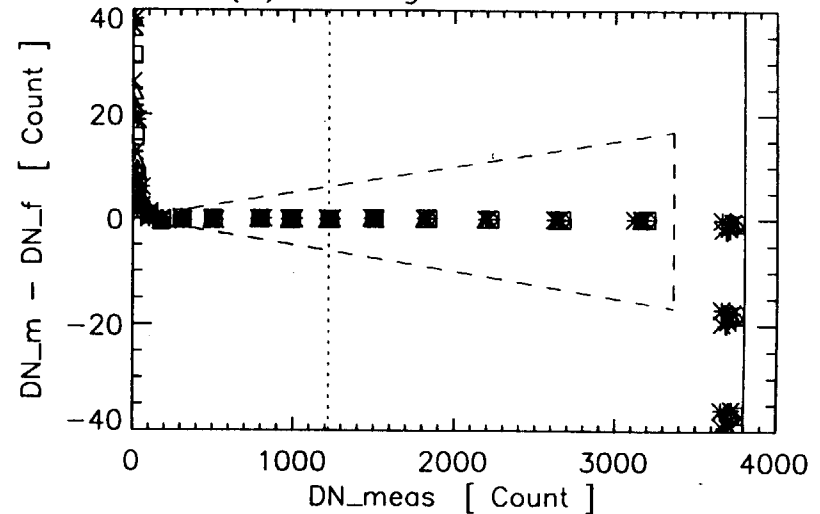
(B) Fitting Residue in T



(C) Coefficient  $a_{(i)}$  Contribution



(D) Fitting Residue in DN

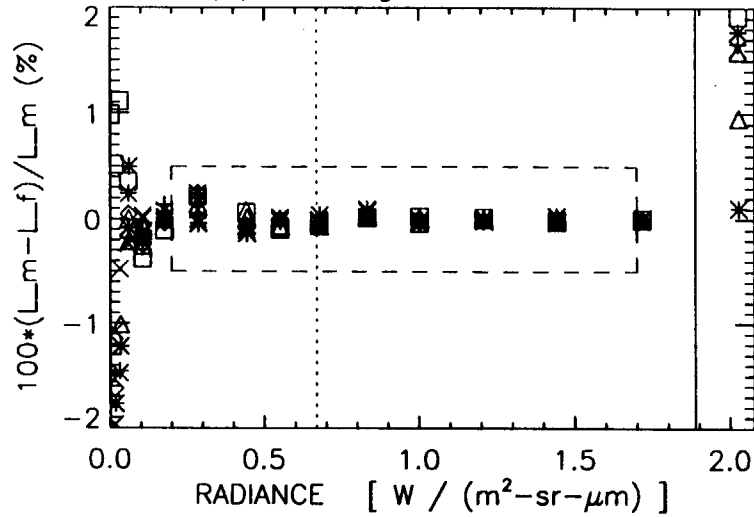


Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.67 (Grn Dotted Line); Lmax = 1.89 (Red Solid Line)  
 0.3Ltyp = 0.20; 0.9Lmax = 1.70 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

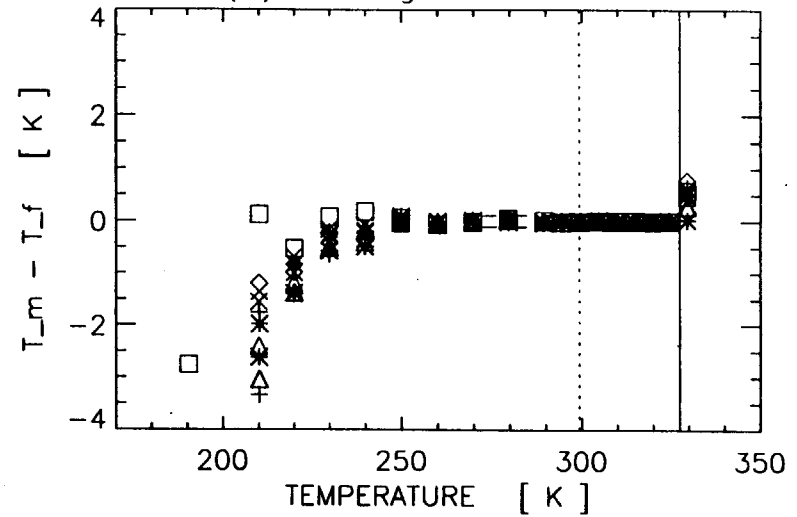
Fitting Range: 250 (K) - 325 (K)  
 0.09Ltyp - 0.91Lmax

B22 L vs DN Cubic Fitting; Nominal Plateau 1 (273 K); UAID: 1506 – 1526

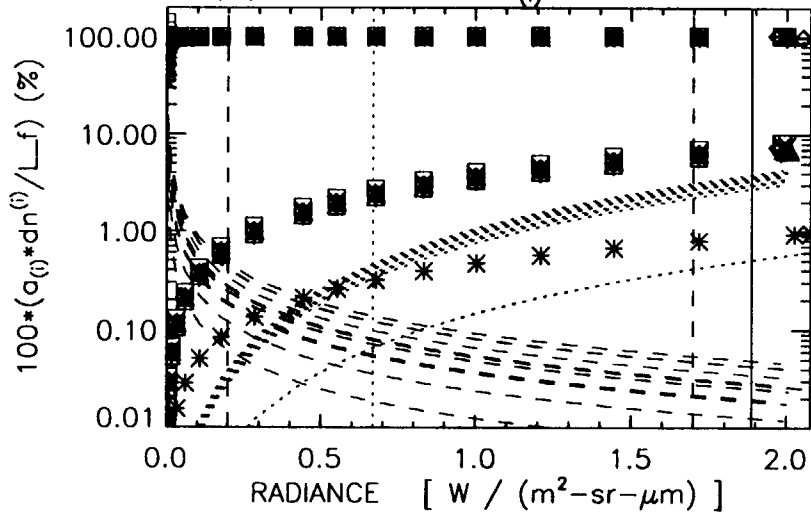
(A) Fitting Residue in L%



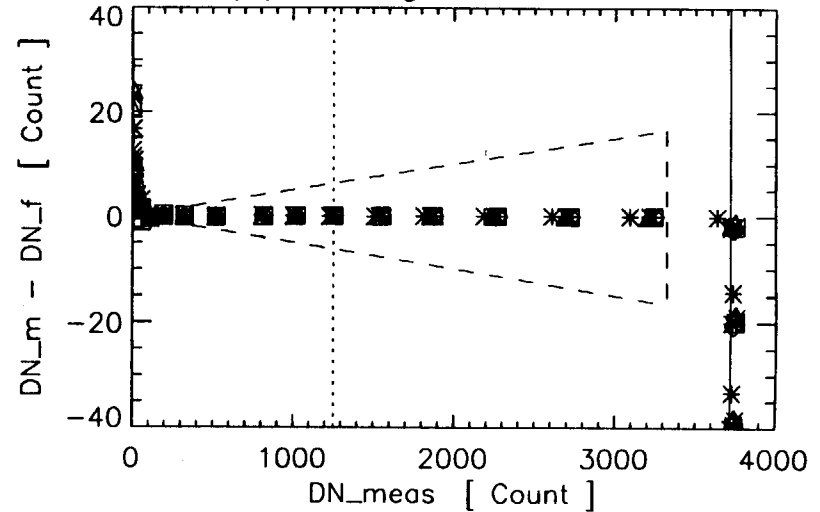
(B) Fitting Residue in T



(C) Coefficient  $a_{(i)}$  Contribution



(D) Fitting Residue in DN

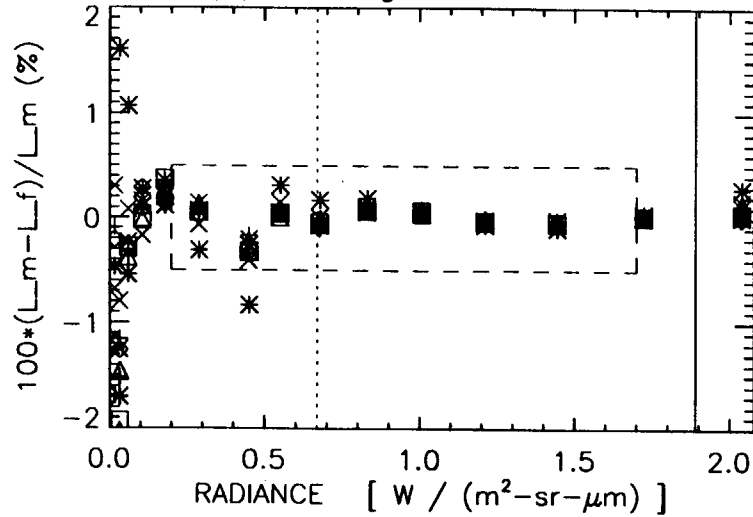


Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.67 (Grn Dotted Line); Lmax = 1.89 (Red Solid Line)  
 0.3Ltyp = 0.20; 0.9Lmax = 1.70 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

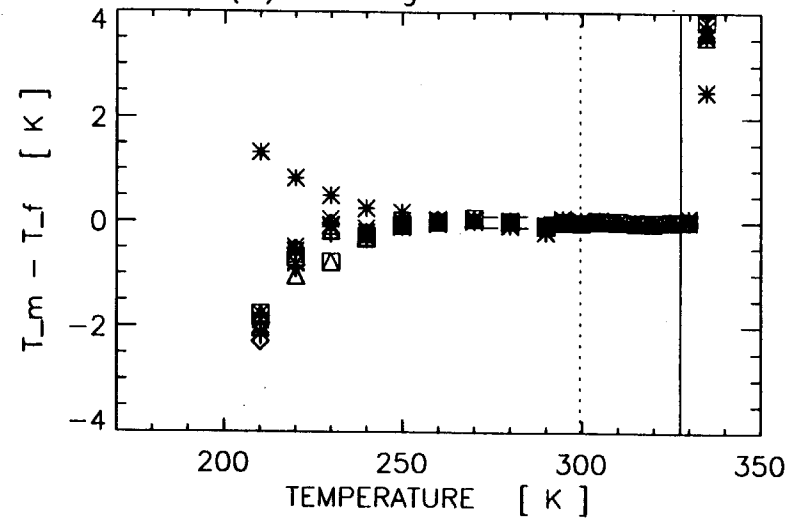
Fitting Range: 250 (K) – 325 (K)  
 0.09Ltyp – 0.91Lmax

B22 L vs DN Cubic Fitting; Nominal Plateau 2 (273 K); UAID: 1595 - 1618

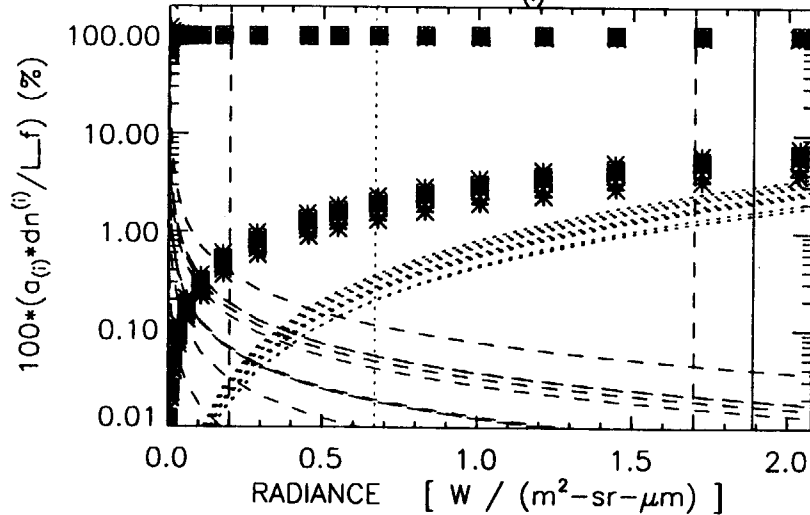
(A) Fitting Residue in L%



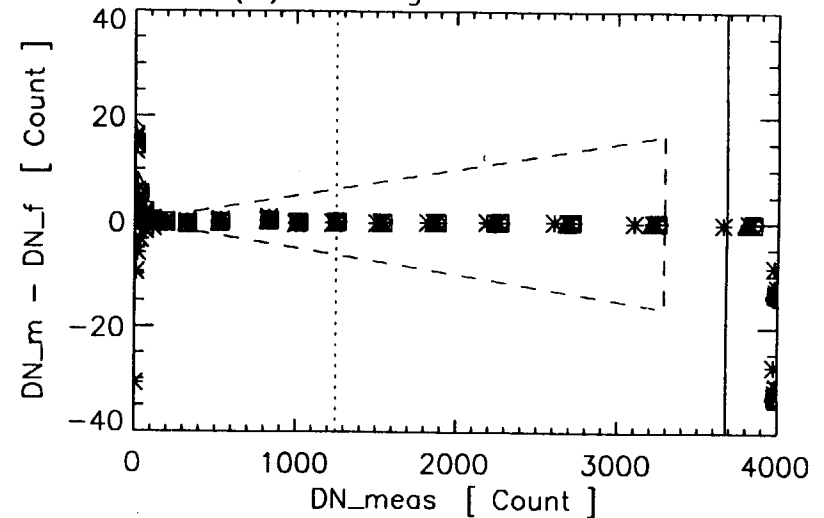
(B) Fitting Residue in T



(C) Coefficient  $a_{(i)}$  Contribution



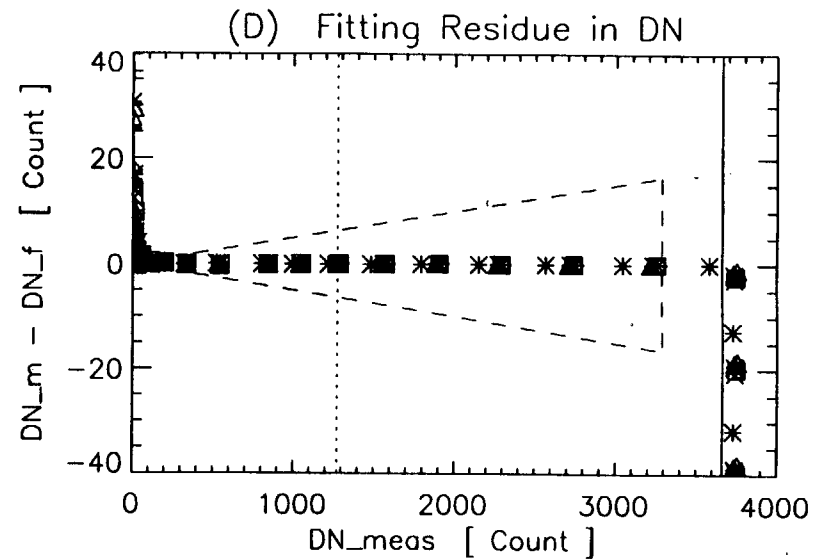
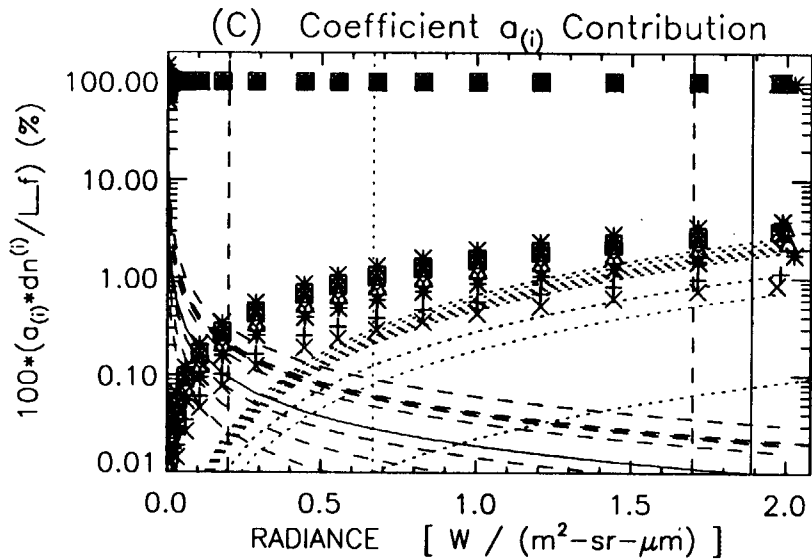
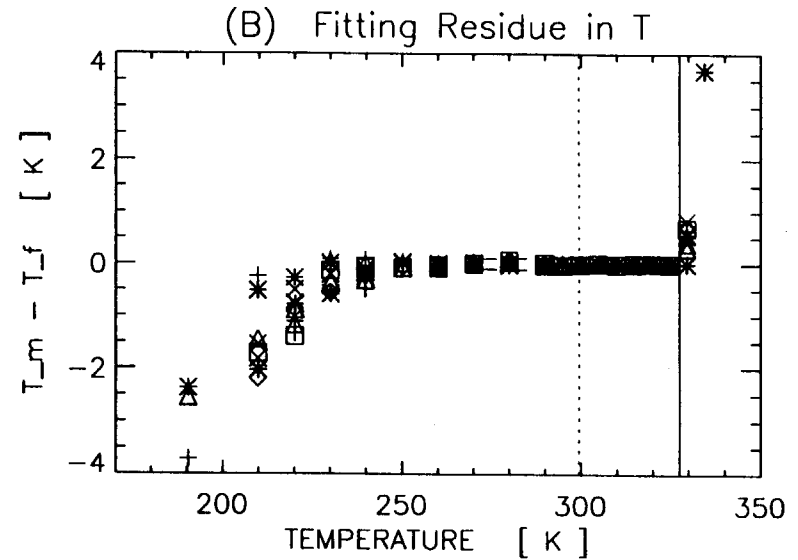
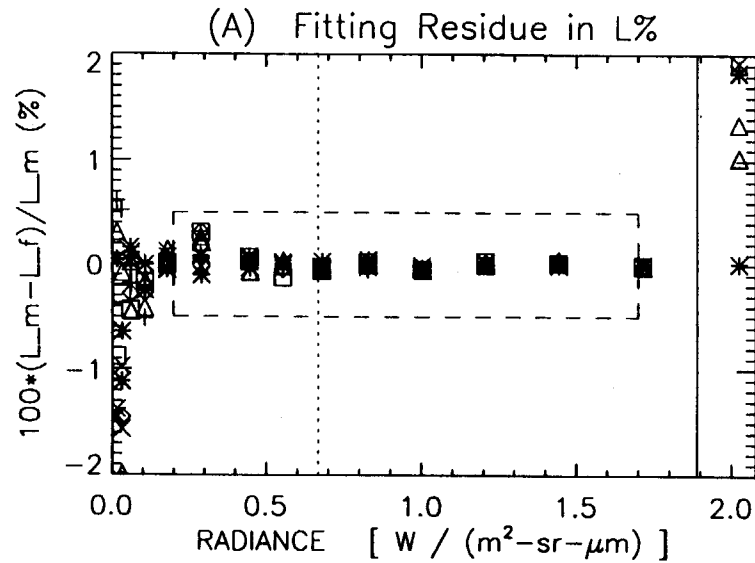
(D) Fitting Residue in DN



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.67 (Grn Dotted Line); Lmax = 1.89 (Red Solid Line)  
 0.3Ltyp = 0.20; 0.9Lmax = 1.70 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 250 (K) - 325 (K)  
 0.09Ltyp - 0.91Lmax

B22 L vs DN Cubic Fitting; Hot Plateau (283 K); UAID: 1402 - 1426

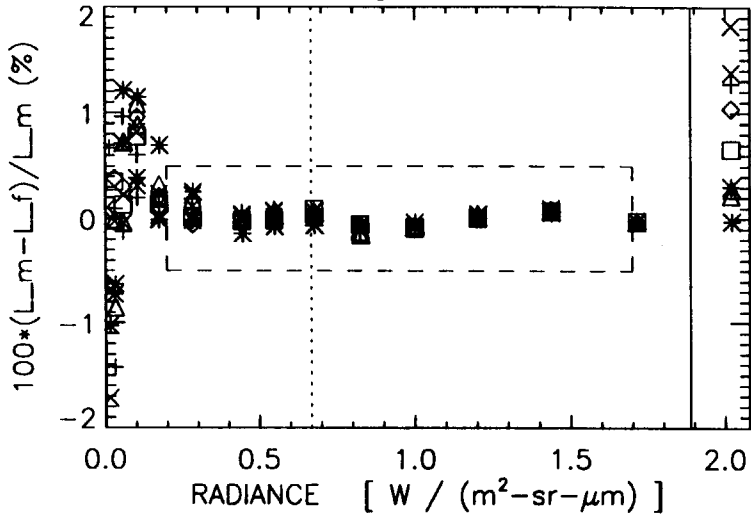


Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.67 (Grn Dotted Line); Lmax = 1.89 (Red Solid Line)  
 0.3Ltyp = 0.20; 0.9Lmax = 1.70 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

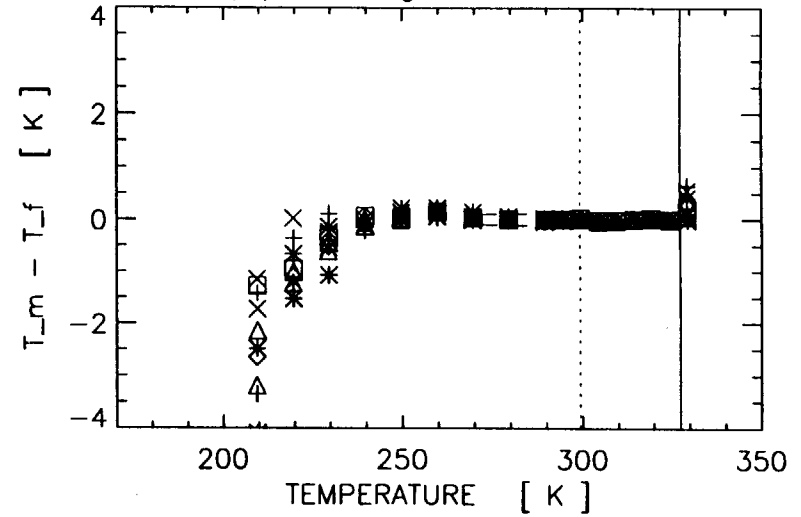
Fitting Range: 250 (K) - 325 (K)  
 0.09Ltyp - 0.91Lmax

B22 L vs DN Cubic Fitting; Cold Plateau (256 K); UAID: 1315 - 1337

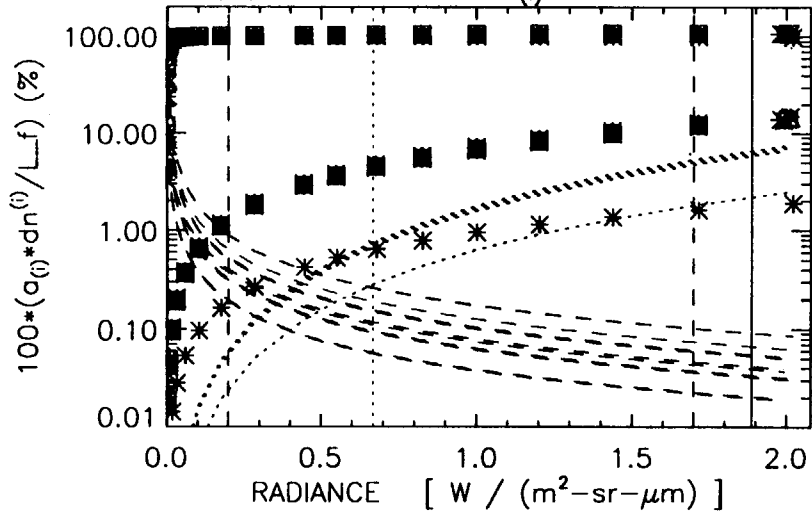
(A) Fitting Residue in L%



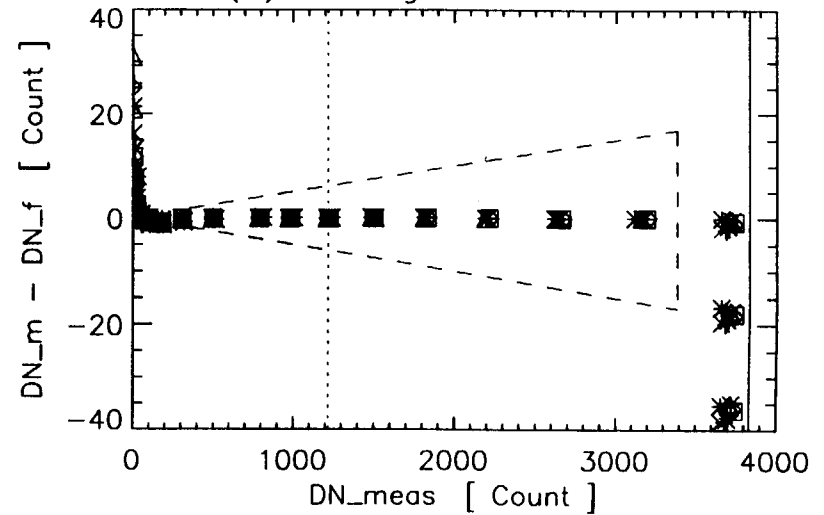
(B) Fitting Residue in T



(C) Coefficient  $a_{(i)}$  Contribution



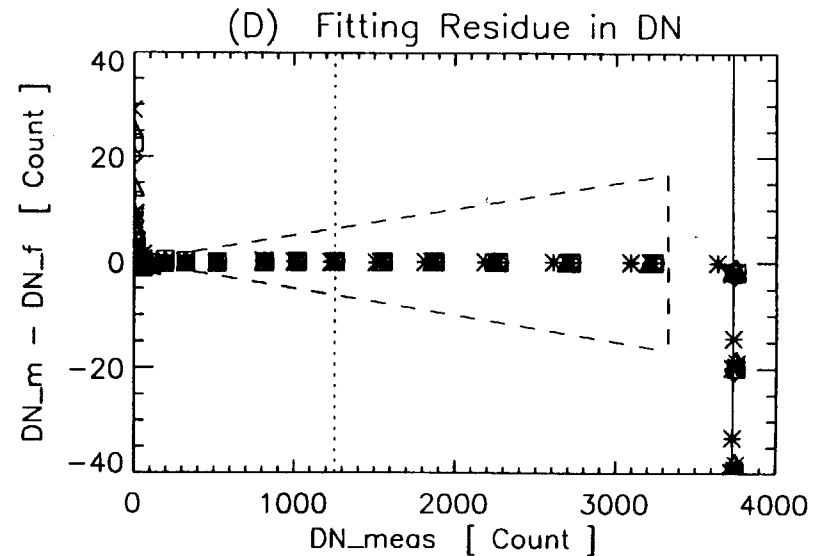
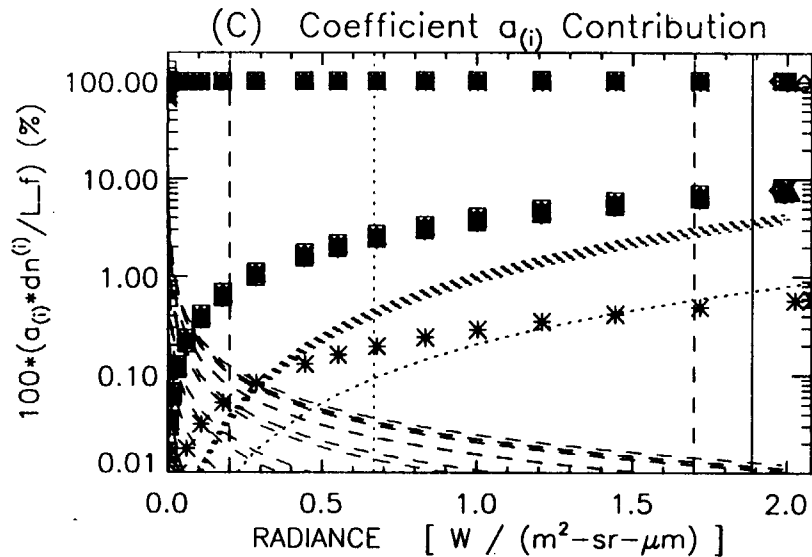
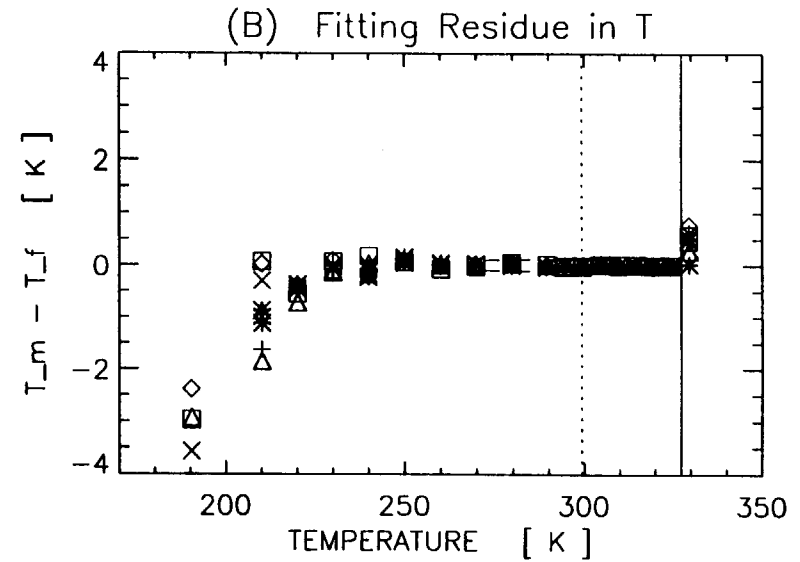
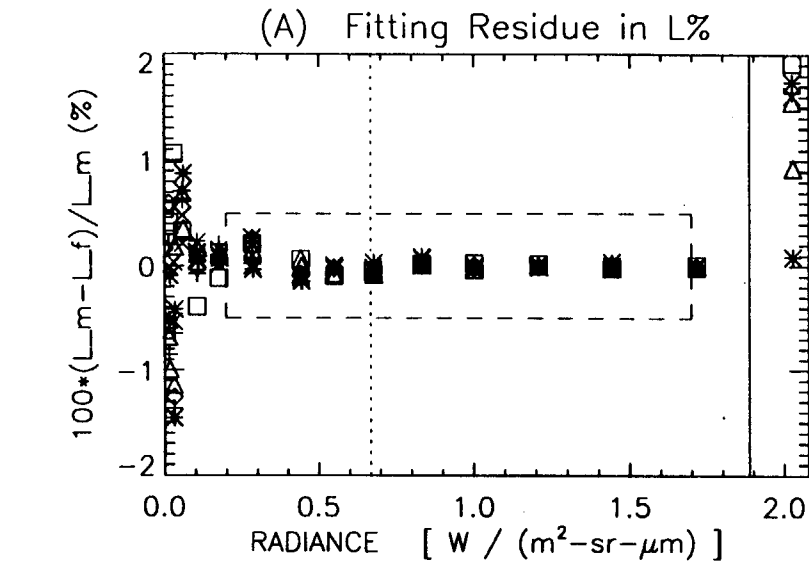
(D) Fitting Residue in DN



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.67 (Grn Dotted Line); Lmax = 1.89 (Red Solid Line)  
 0.3Ltyp = 0.20; 0.9Lmax = 1.70 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 220 (K) - 325 (K)  
 0.01Ltyp - 0.91Lmax

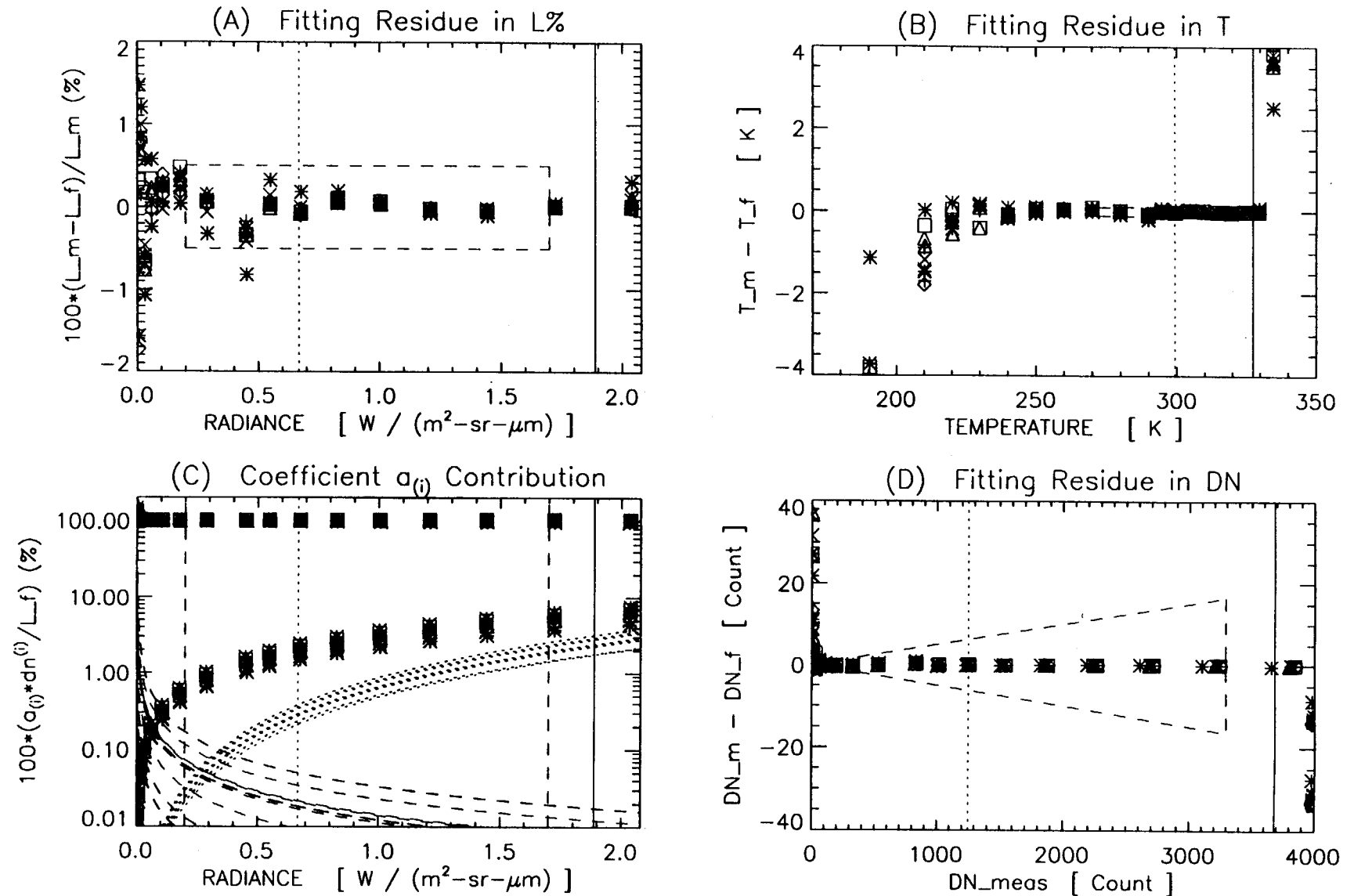
B22 L vs DN Cubic Fitting; Nominal Plateau 1 (273 K); UAID: 1506 – 1526



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.67 (Grn Dotted Line); Lmax = 1.89 (Red Solid Line)  
 0.3Ltyp = 0.20; 0.9Lmax = 1.70 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

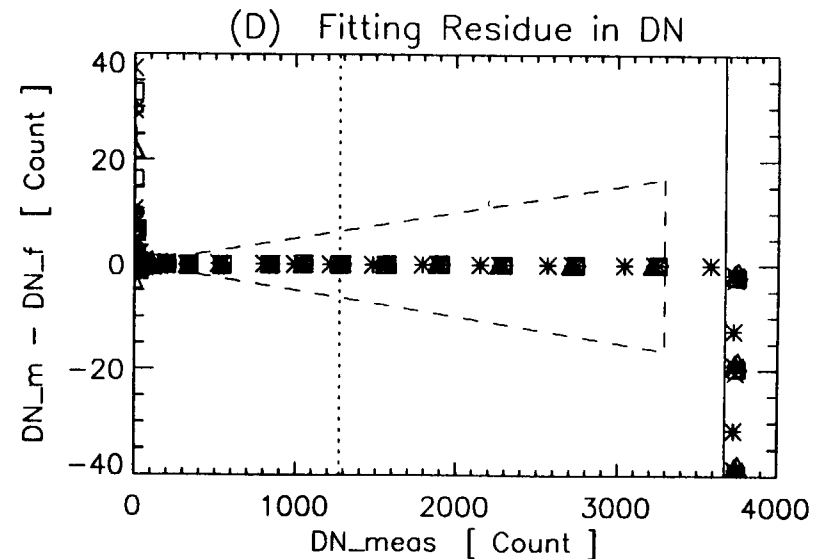
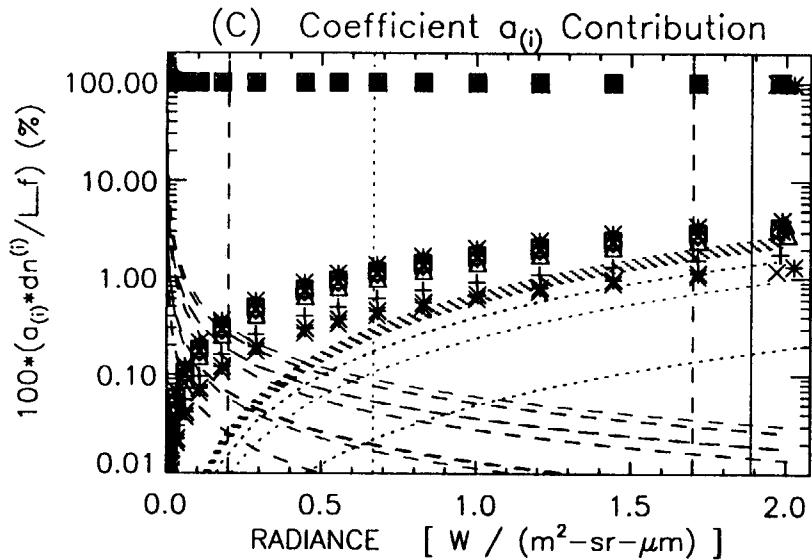
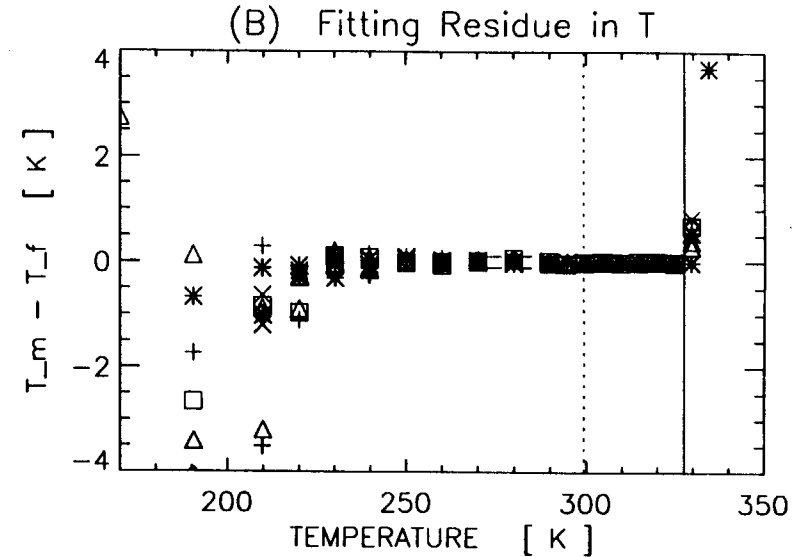
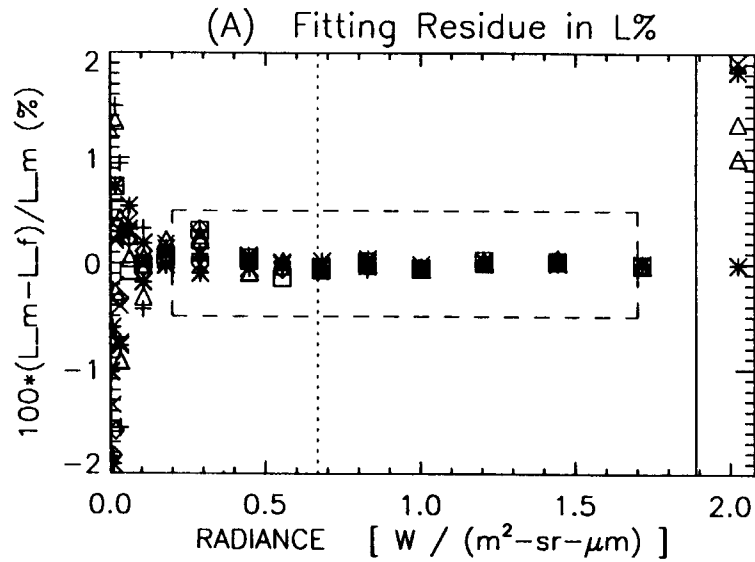
Fitting Range: 220 (K) - 325 (K)  
 0.01Ltyp - 0.91Lmax

B22 L vs DN Cubic Fitting; Nominal Plateau 2 (273 K); UAID: 1595 - 1618



Fitting Range: 220 (K) - 325 (K)  
 0.01Ltyp - 0.91Lmax

B22 L vs DN Cubic Fitting; Hot Plateau (283 K); UAID: 1402 - 1426



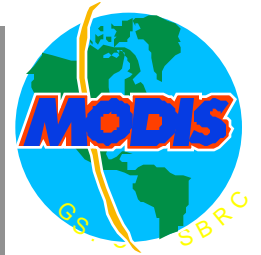
Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.67 (Grn Dotted Line); Lmax = 1.89 (Red Solid Line)  
 0.3Ltyp = 0.20; 0.9Lmax = 1.70 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 220 (K) - 325 (K)  
 0.01Ltyp - 0.91Lmax



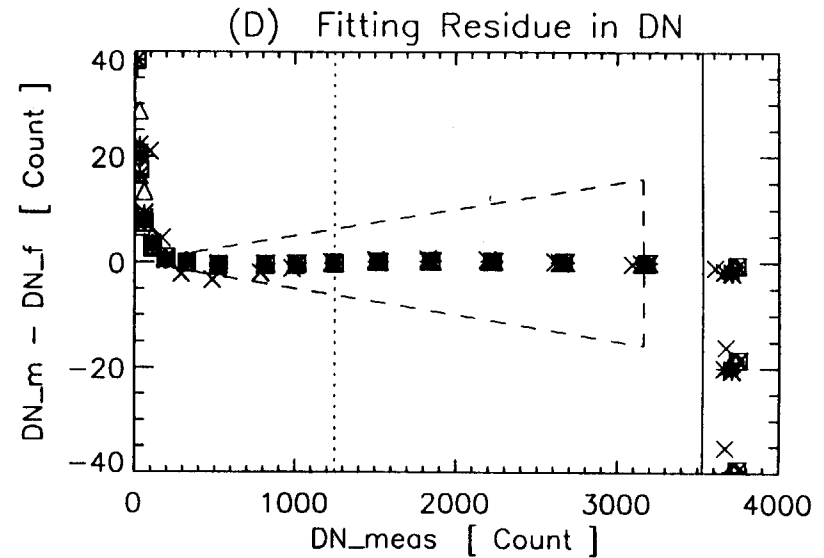
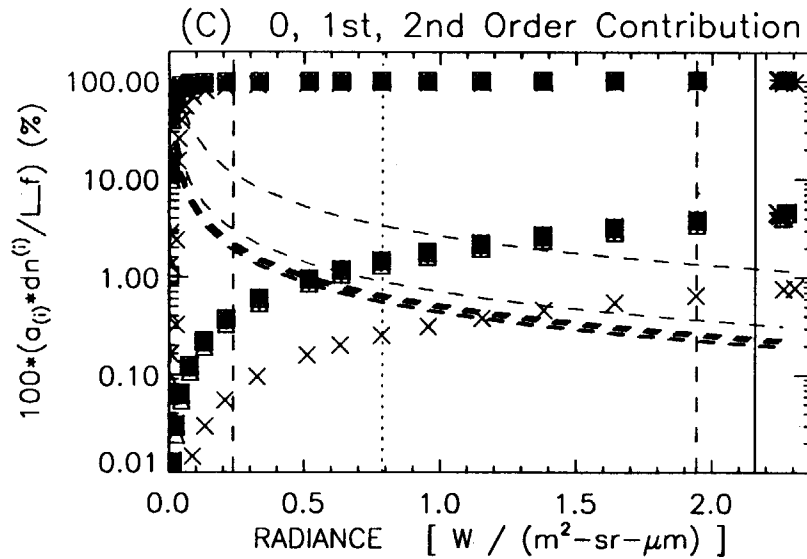
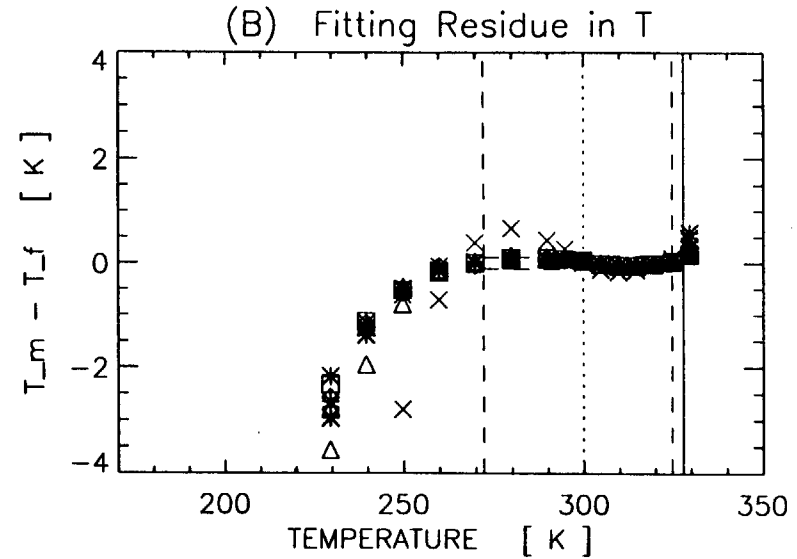
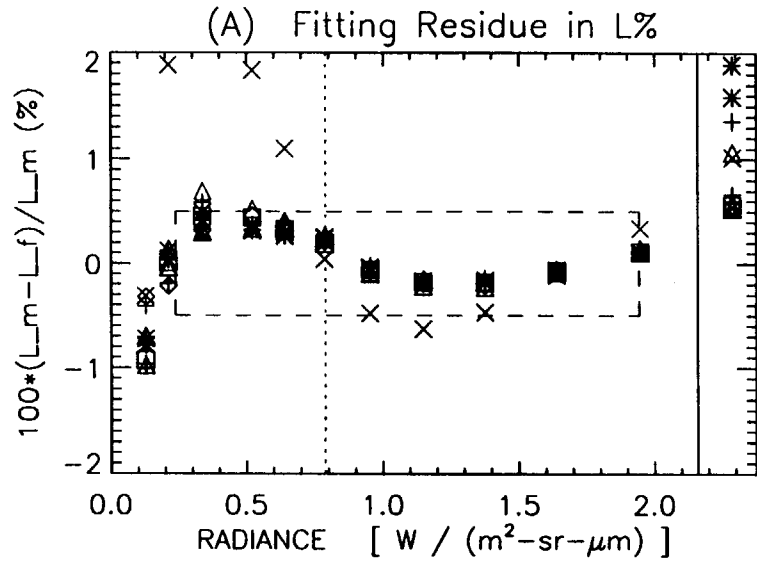


# Band 23 Calibration Fitting Summary



Instrument Temperature	# of BCS levels used	Cold Plateau (256K)	Nominal 1 (273K)	Nominal 2 (273K)	Hot Plateau (283K)
Quadratic Fitting (250 K - 325 K)	12				
Quadratic Fitting (220 K - 325 K)	15				
Cubic Fitting (250 K - 325 K)	12				
Cubic Fitting (220 K - 325 K)	15				

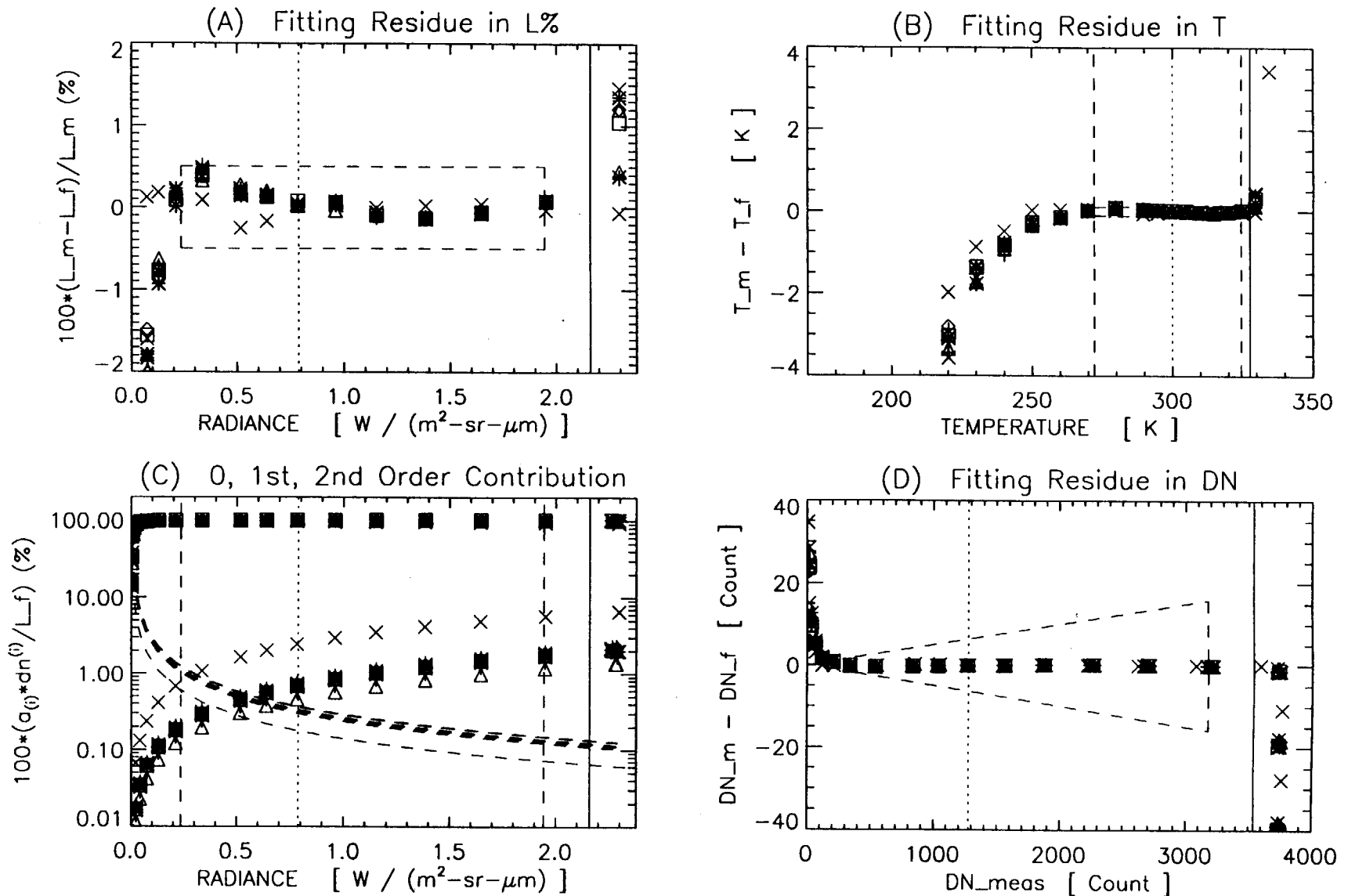
B23 L vs DN Quadratic Fitting; Cold Plateau (256 K); UAID: 1315 – 1337



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.79 (Grn Dotted Line); Lmax = 2.16 (Red Solid Line)  
 0.3Ltyp = 0.24; 0.9Lmax = 1.94 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 250 (K) - 325 (K)  
 0.09Ltyp - 0.90Lmax

B23 L vs DN Quadratic Fitting; Nominal Plateau 1 (273 K); UAID: 1506 – 1526

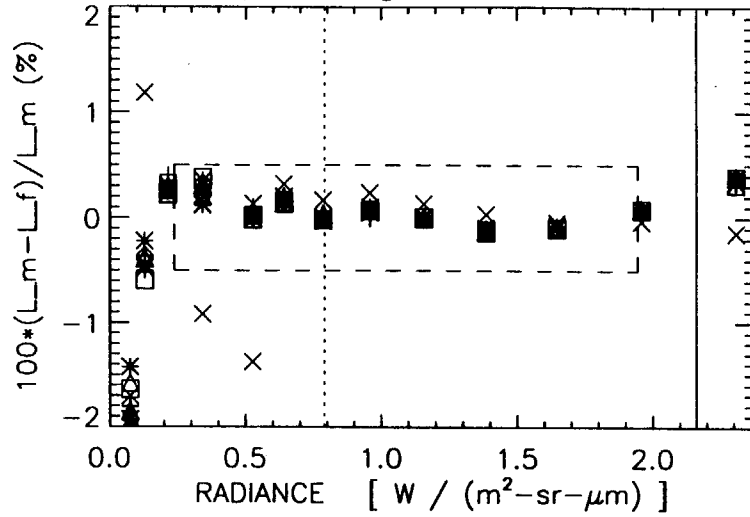


Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.79 (Grn Dotted Line); Lmax = 2.16 (Red Solid Line)  
 0.3Ltyp = 0.24; 0.9Lmax = 1.94 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

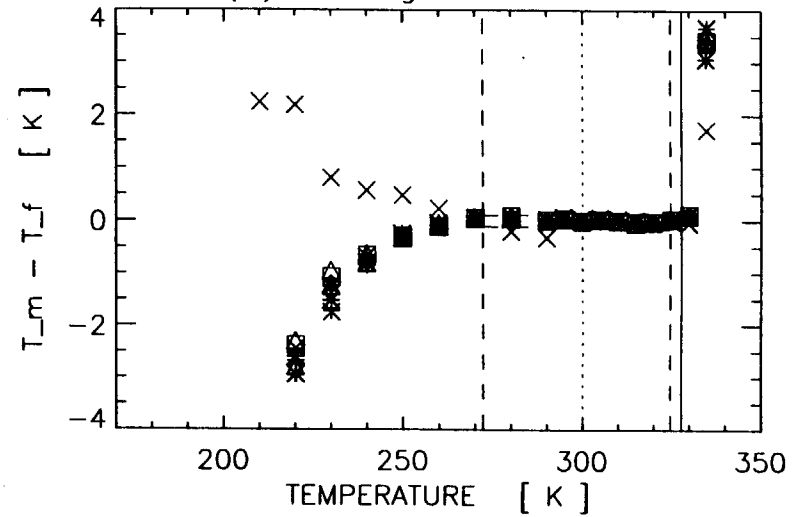
Fitting Range: 250 (K) – 325 (K)  
 0.09Ltyp – 0.90Lmax

B23 L vs DN Quadratic Fitting; Nominal Plateau 2 (273 K); UAID: 1595 - 1618

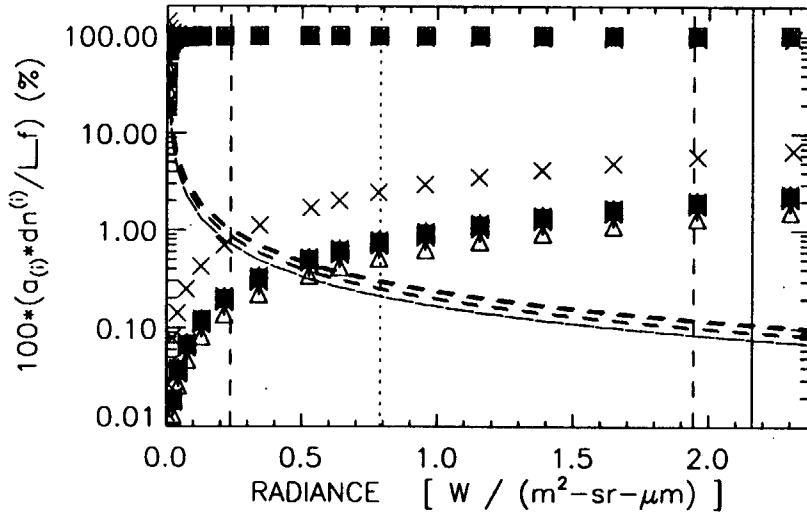
(A) Fitting Residue in L%



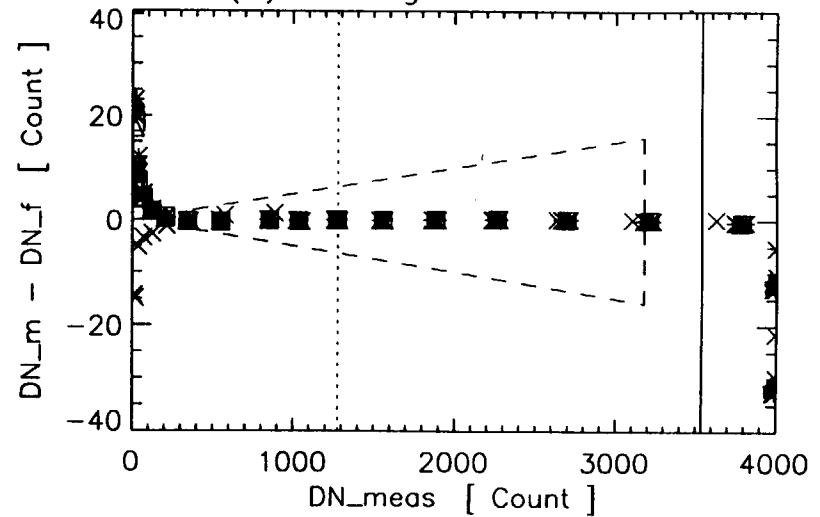
(B) Fitting Residue in T



(C) 0, 1st, 2nd Order Contribution



(D) Fitting Residue in DN

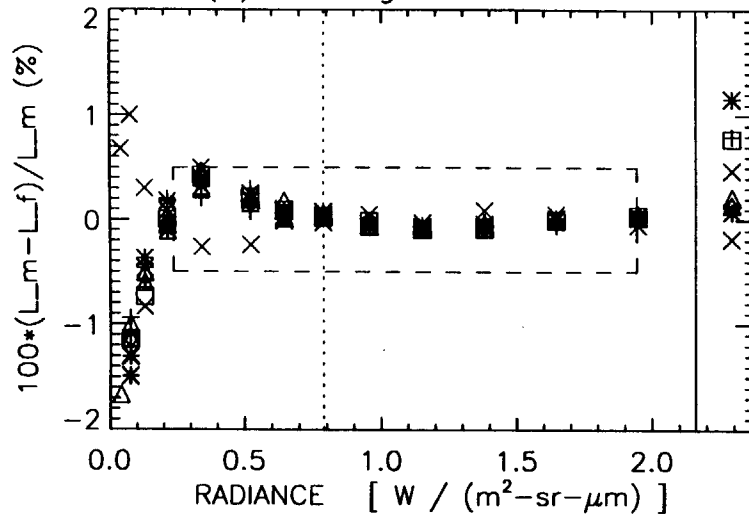


Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.79 (Grn Dotted Line); Lmax = 2.16 (Red Solid Line)  
 0.3Ltyp = 0.24; 0.9Lmax = 1.94 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

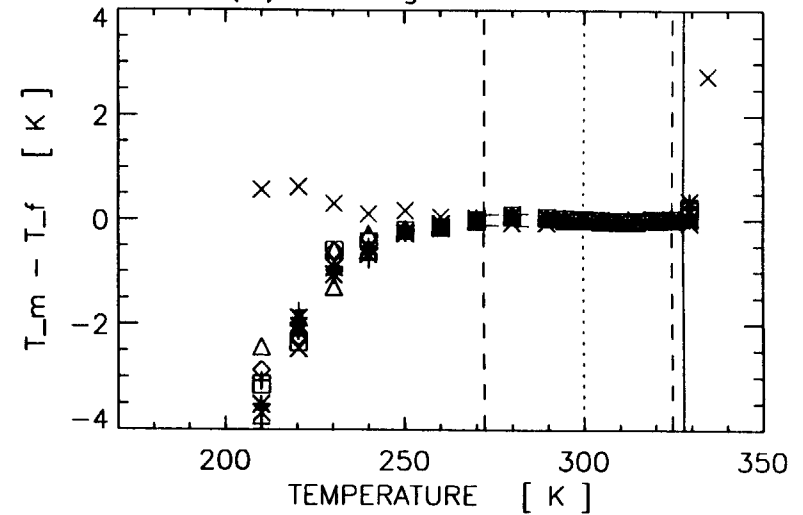
Fitting Range: 250 (K) - 325 (K)  
 0.09Ltyp - 0.91Lmax

B23 L vs DN Quadratic Fitting; Hot Plateau (283 K); UAID: 1402 - 1426

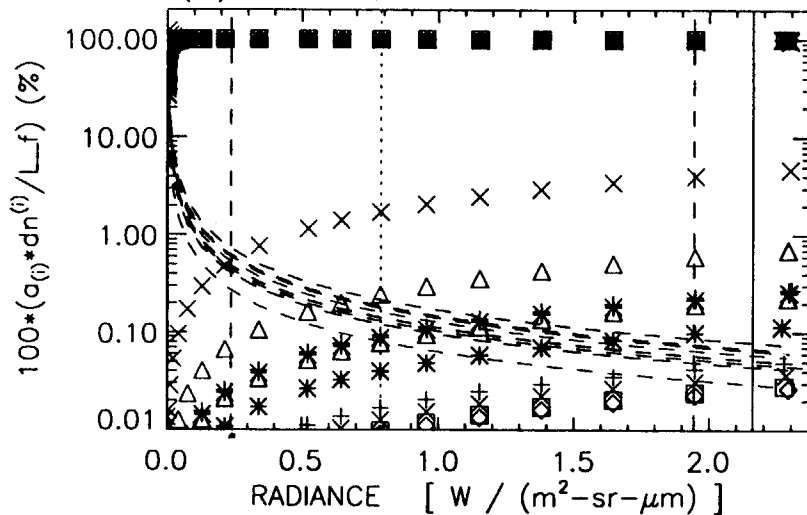
(A) Fitting Residue in L%



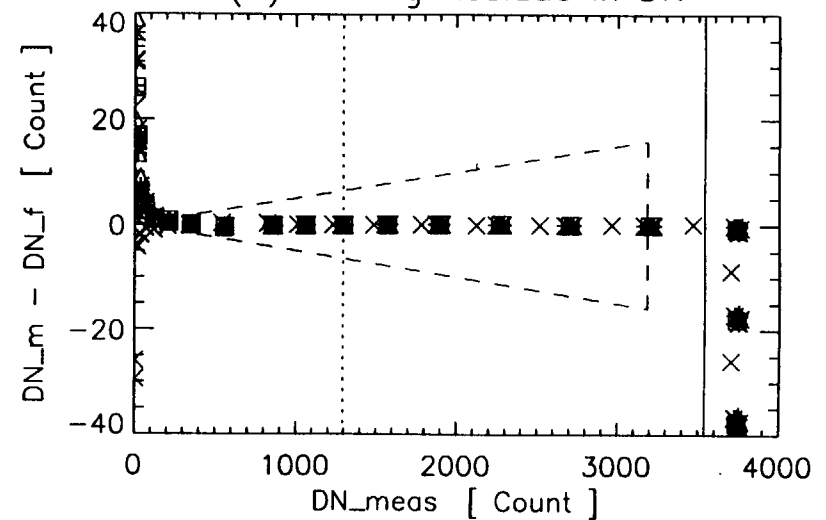
(B) Fitting Residue in T



(C) 0, 1st, 2nd Order Contribution



(D) Fitting Residue in DN

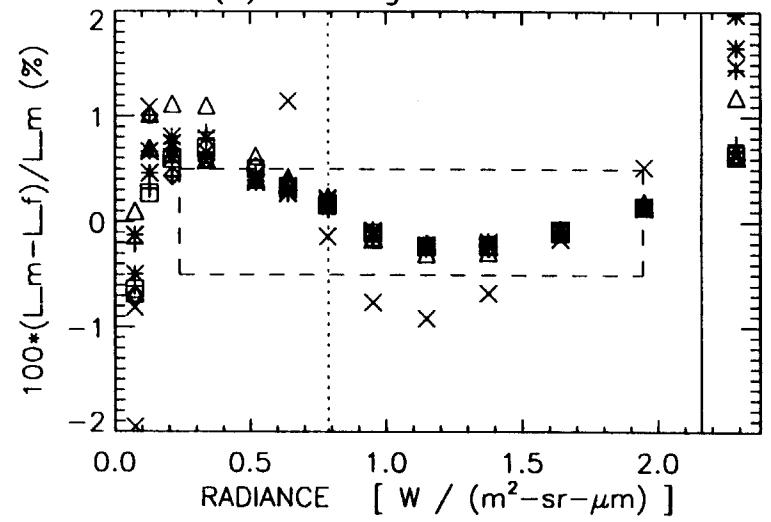


Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.79 (Grn Dotted Line); Lmax = 2.16 (Red Solid Line)  
 0.3Ltyp = 0.24; 0.9Lmax = 1.94 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

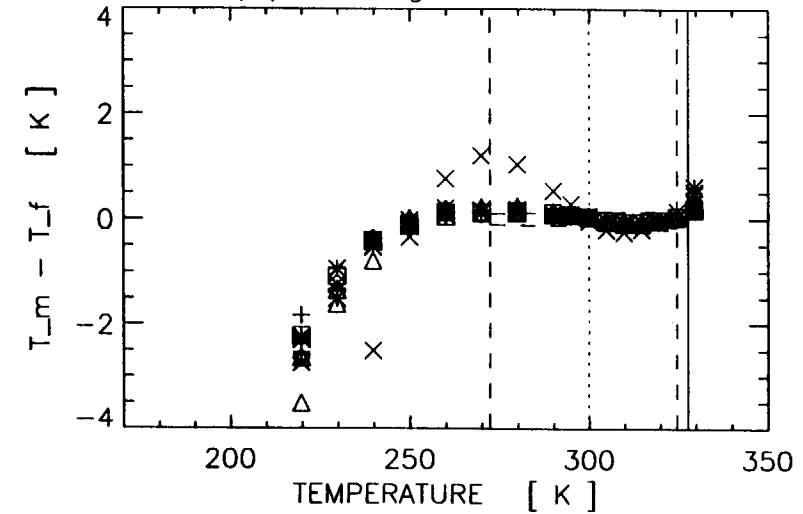
Fitting Range: 250 (K) - 325 (K)  
 0.10Ltyp - 0.90Lmax

B23 L vs DN Quadratic Fitting; Cold Plateau (256 K); UAID: 1315 – 1337

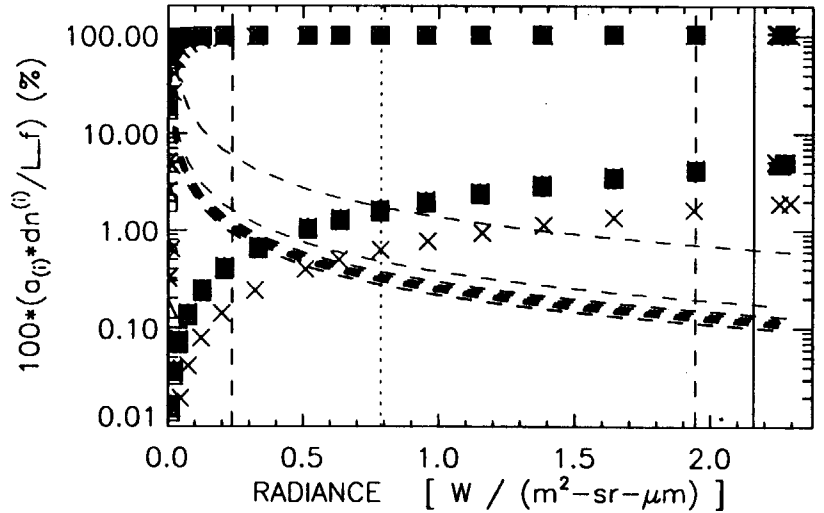
(A) Fitting Residue in L%



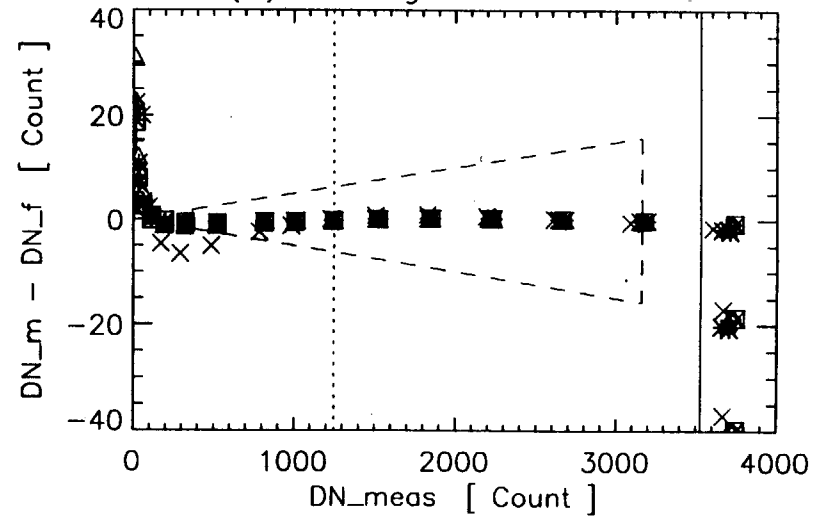
(B) Fitting Residue in T



(C) 0, 1st, 2nd Order Contribution



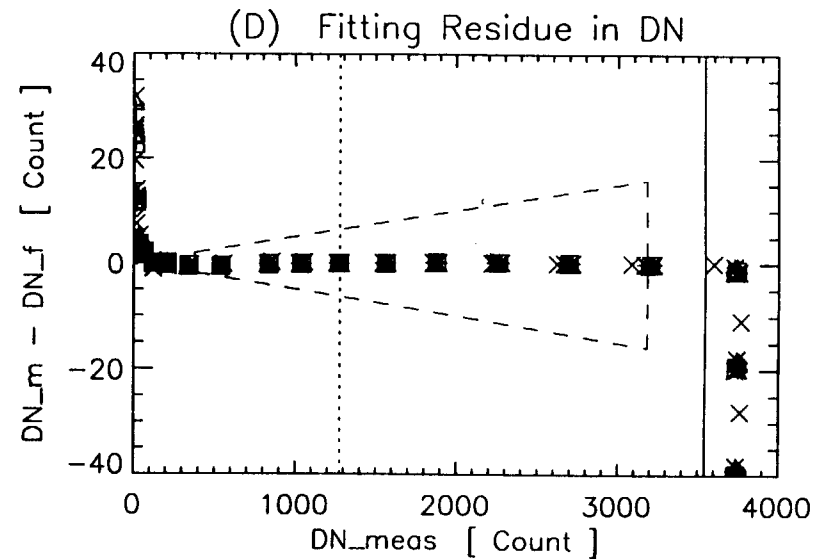
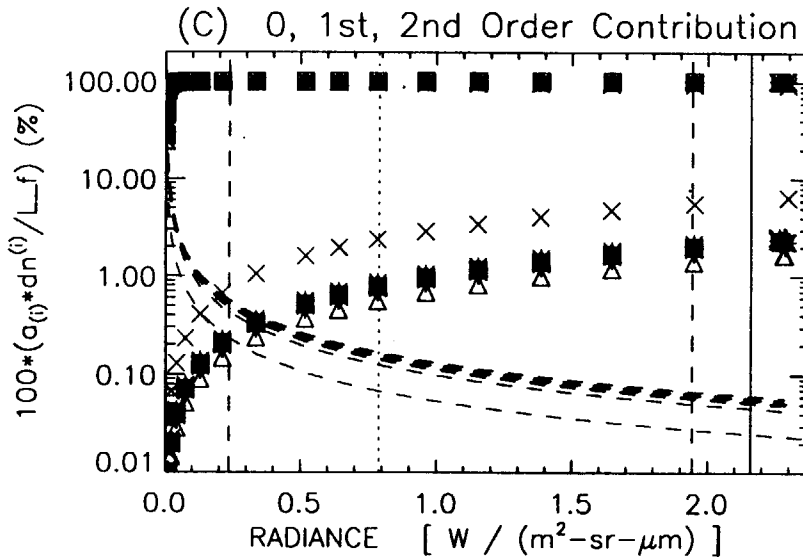
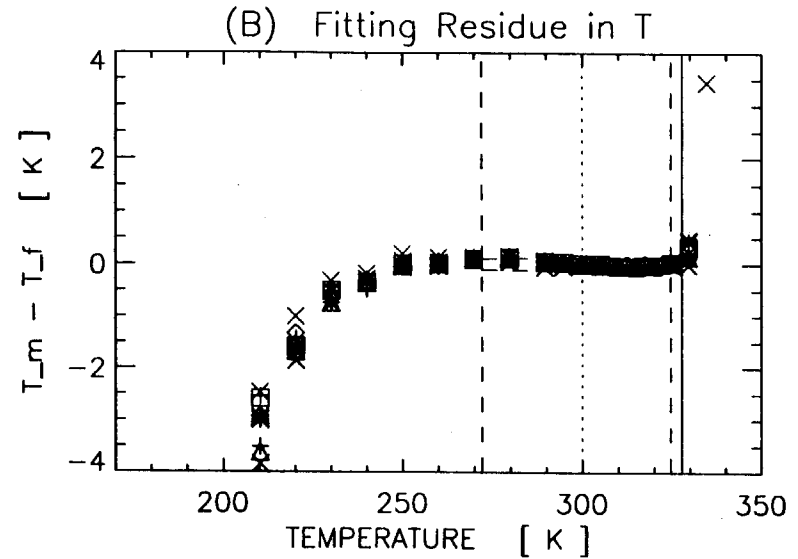
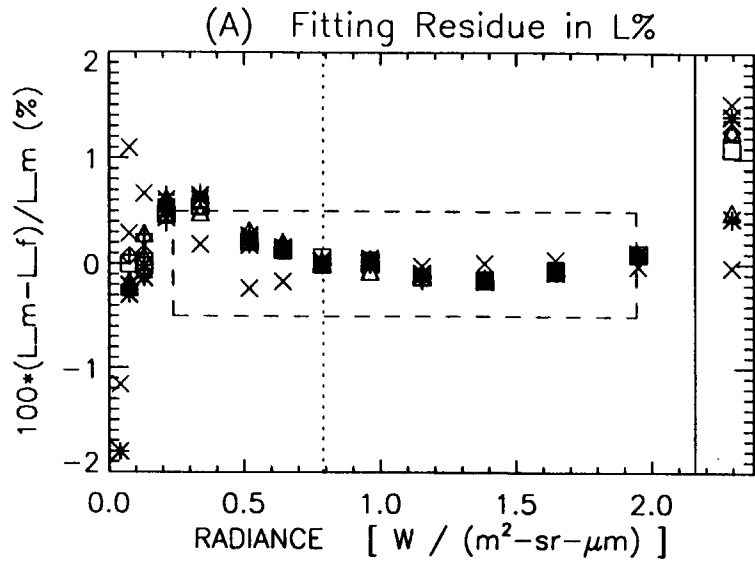
(D) Fitting Residue in DN



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.79 (Grn Dotted Line); Lmax = 2.16 (Red Solid Line)  
 0.3Ltyp = 0.24; 0.9Lmax = 1.94 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 220 (K) – 325 (K)  
 0.01Ltyp – 0.90Lmax

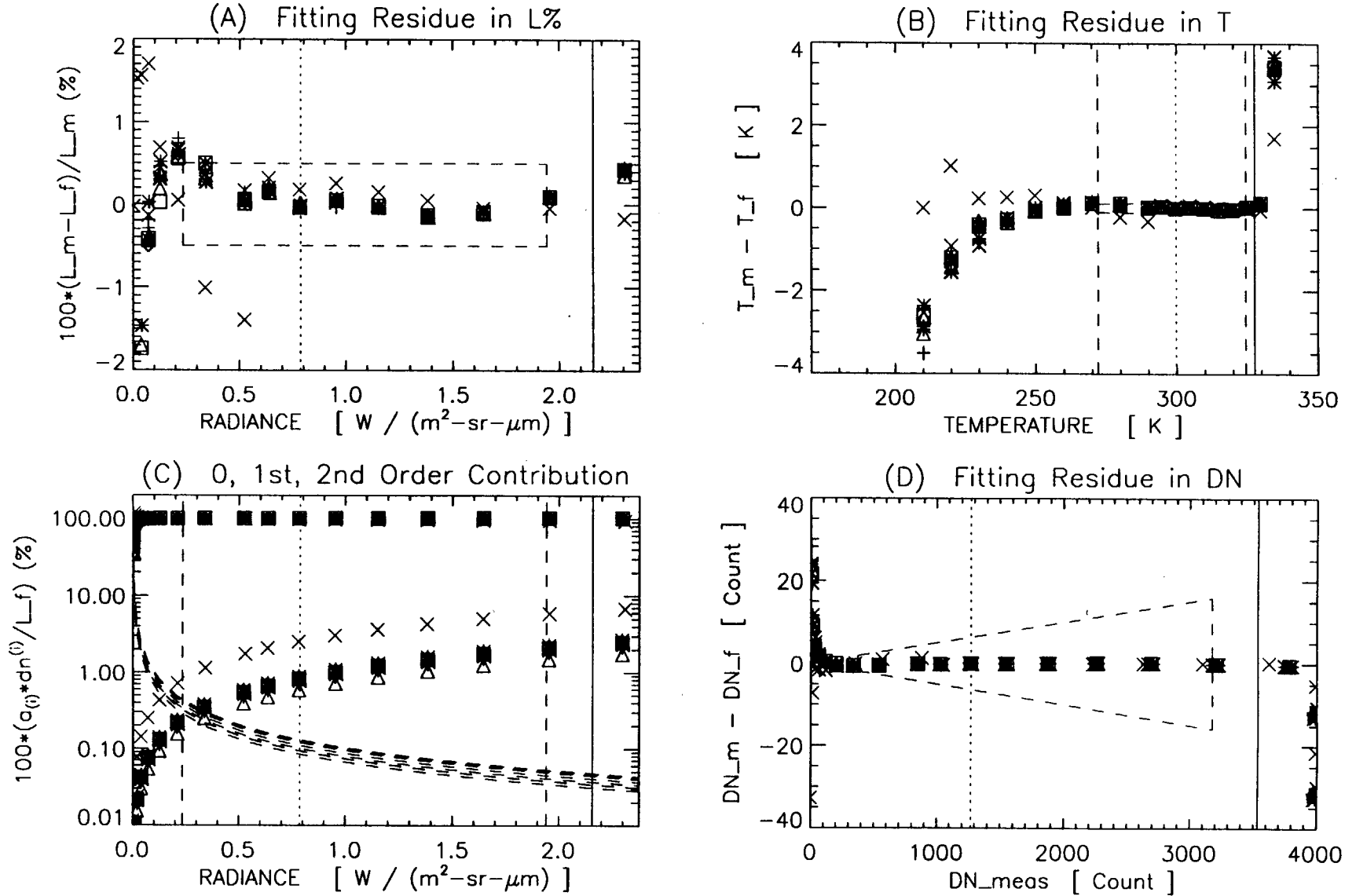
B23 L vs DN Quadratic Fitting; Nominal Plateau 1 (273 K); UAID: 1506 – 1526



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.79 (Grn Dotted Line); Lmax = 2.16 (Red Solid Line)  
 0.3Ltyp = 0.24; 0.9Lmax = 1.94 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 220 (K) – 325 (K)  
 0.01Ltyp – 0.90Lmax

B23 L vs DN Quadratic Fitting; Nominal Plateau 2 (273 K); UAID: 1595 – 1618



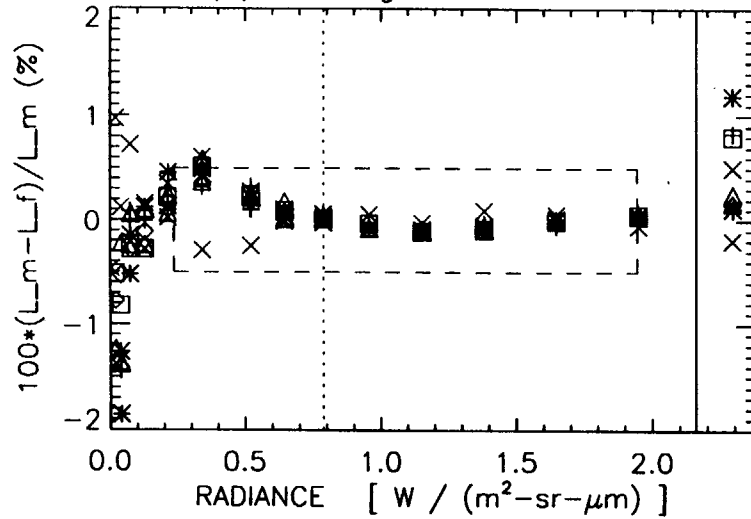
Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.79 (Grn Dotted Line); Lmax = 2.16 (Red Solid Line)  
 0.3Ltyp = 0.24; 0.9Lmax = 1.94 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 220 (K) – 325 (K)  
 0.01Ltyp – 0.91Lmax

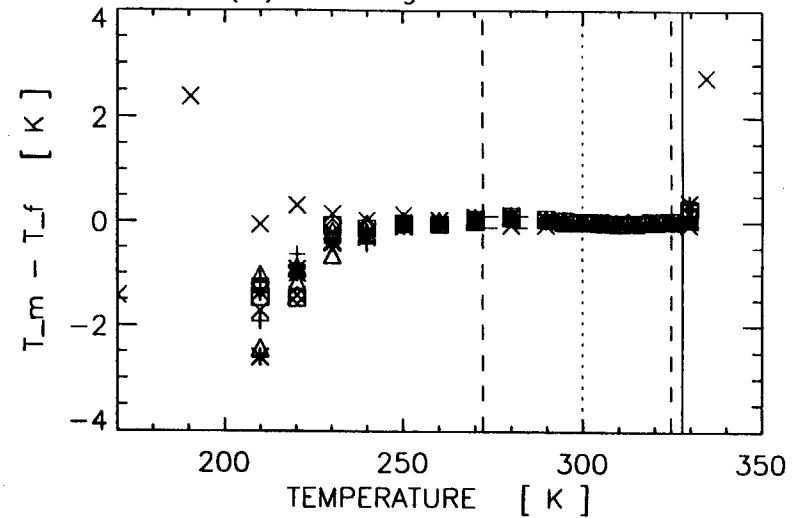


B23 L vs DN Quadratic Fitting; Hot Plateau (283 K); UAID: 1402 - 1426

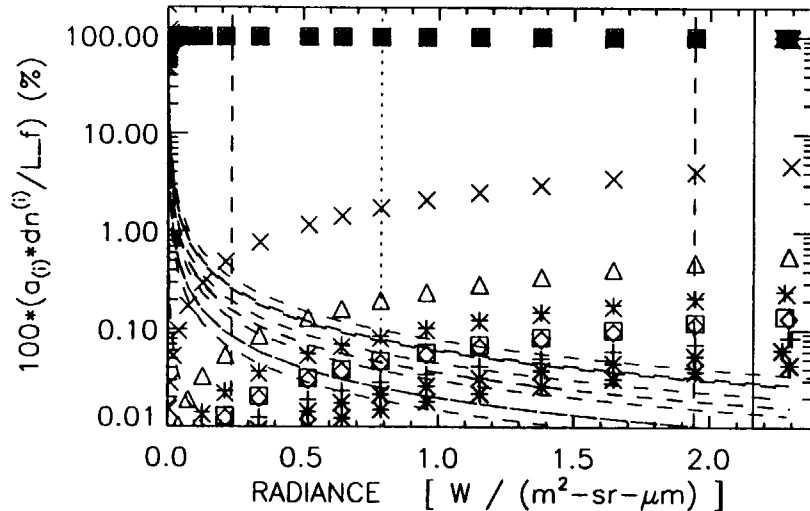
(A) Fitting Residue in L%



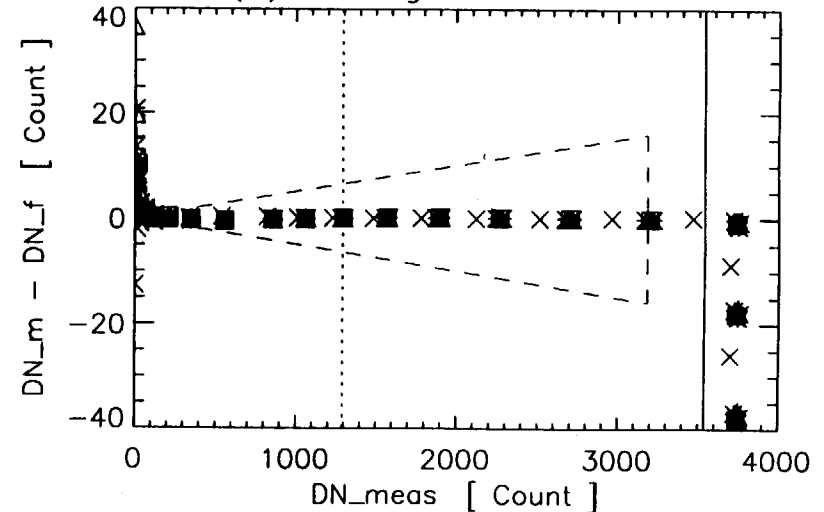
(B) Fitting Residue in T



(C) 0, 1st, 2nd Order Contribution



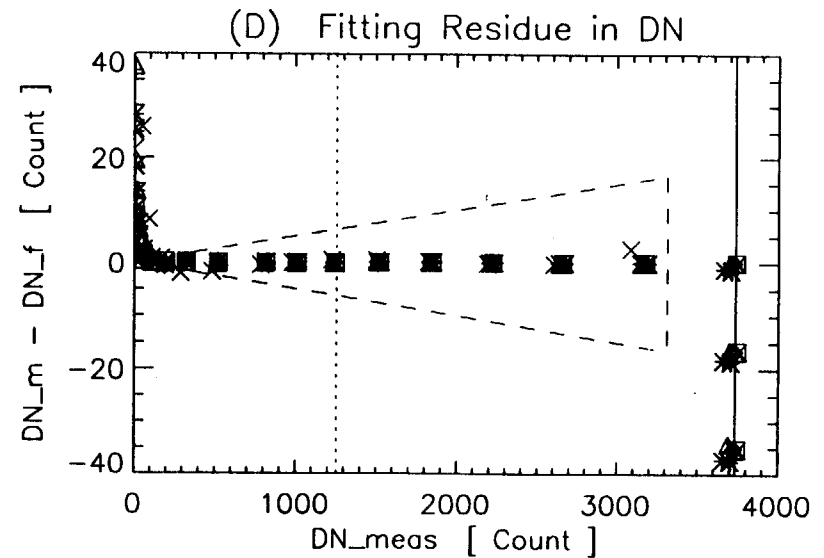
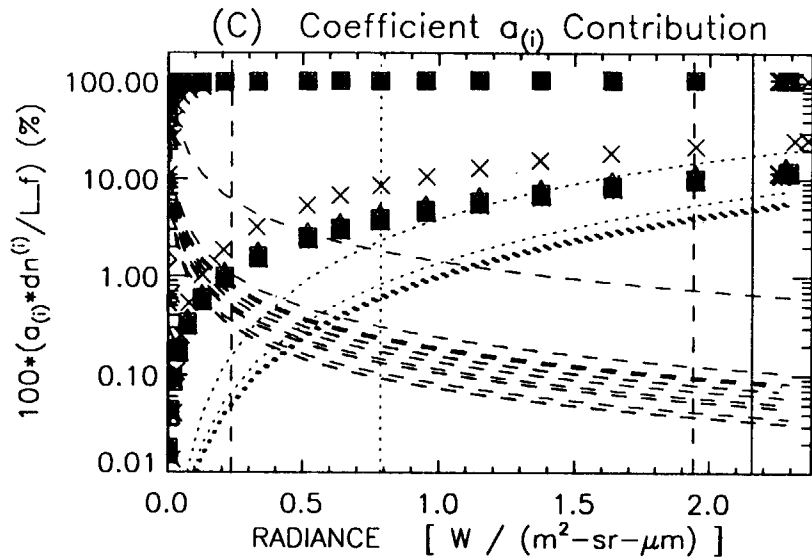
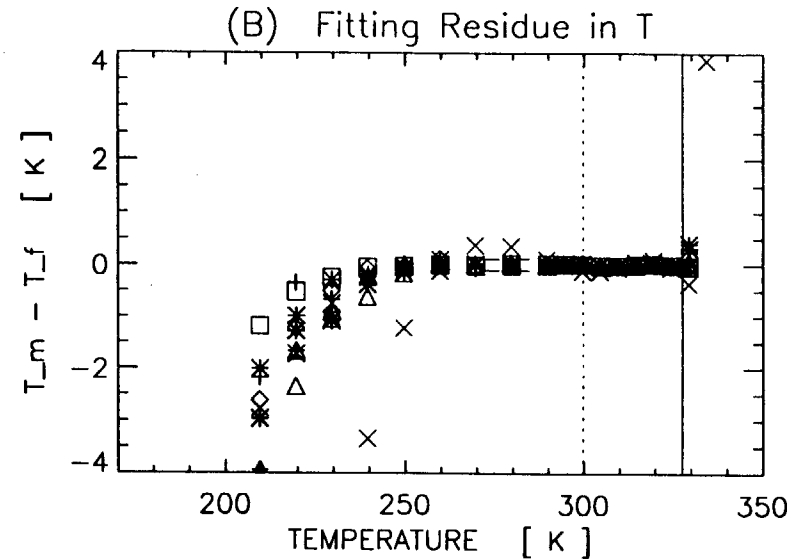
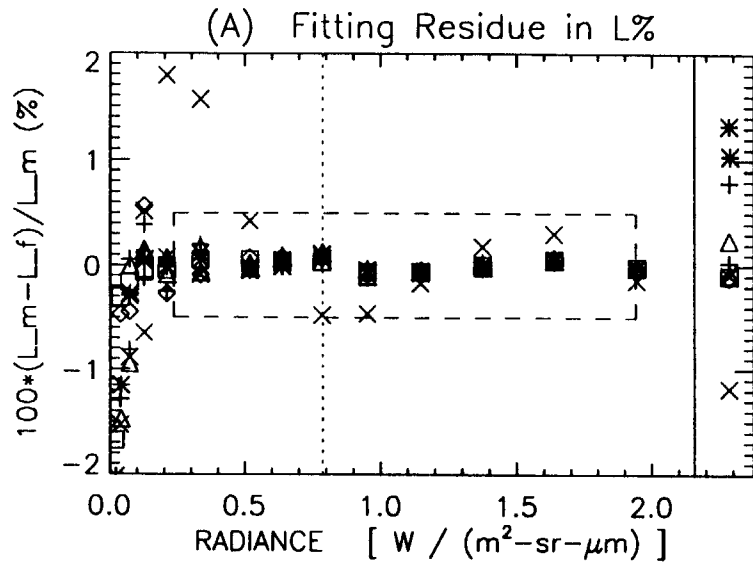
(D) Fitting Residue in DN



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.79 (Grn Dotted Line); Lmax = 2.16 (Red Solid Line)  
 0.3Ltyp = 0.24; 0.9Lmax = 1.94 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 220 (K) - 325 (K)  
 0.01Ltyp - 0.90Lmax

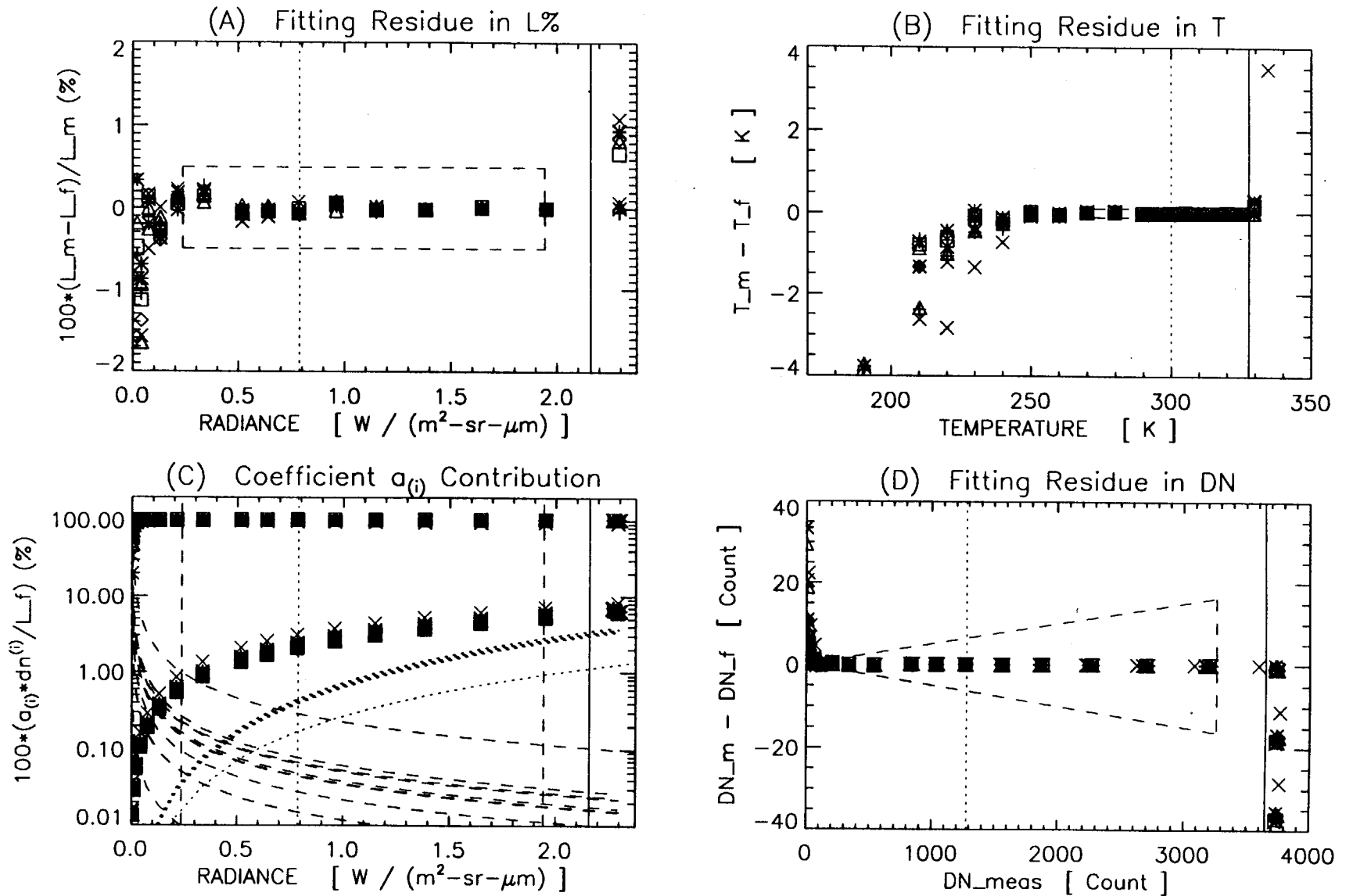
B23 L vs DN Cubic Fitting; Cold Plateau (256 K); UAID: 1315 - 1337



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.79 (Grn Dotted Line); Lmax = 2.16 (Red Solid Line)  
 0.3Ltyp = 0.24; 0.9Lmax = 1.94 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 250 (K) - 325 (K)  
 0.09Ltyp - 0.90Lmax

B23 L vs DN Cubic Fitting; Nominal Plateau 1 (273 K); UAID: 1506 – 1526

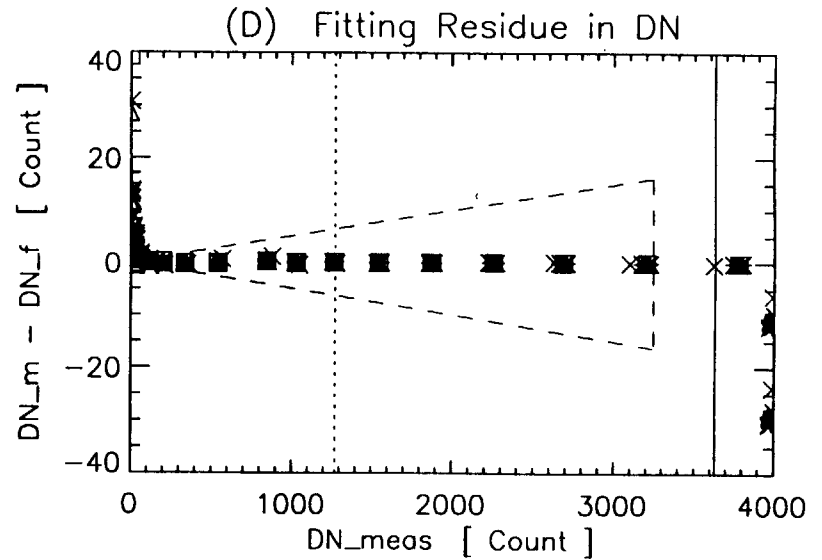
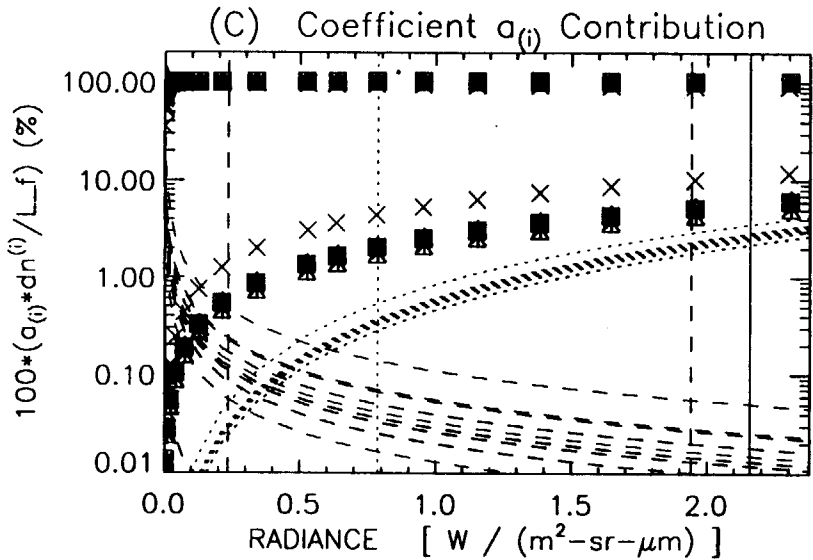
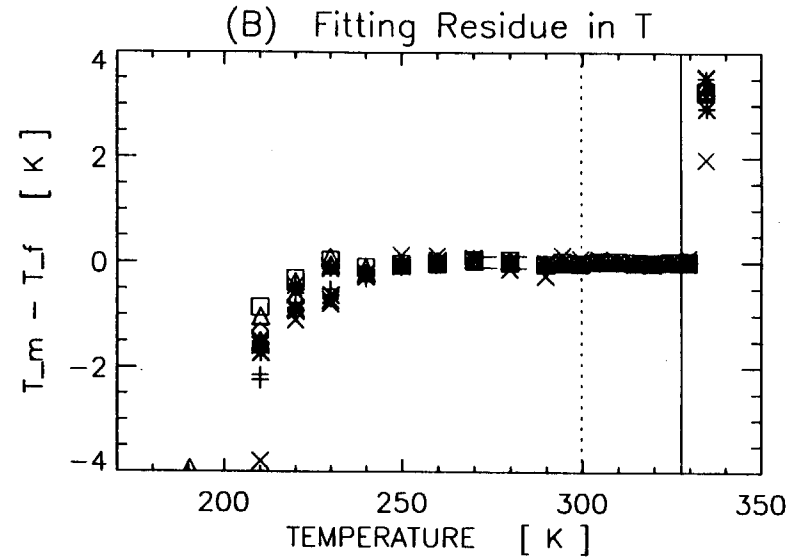
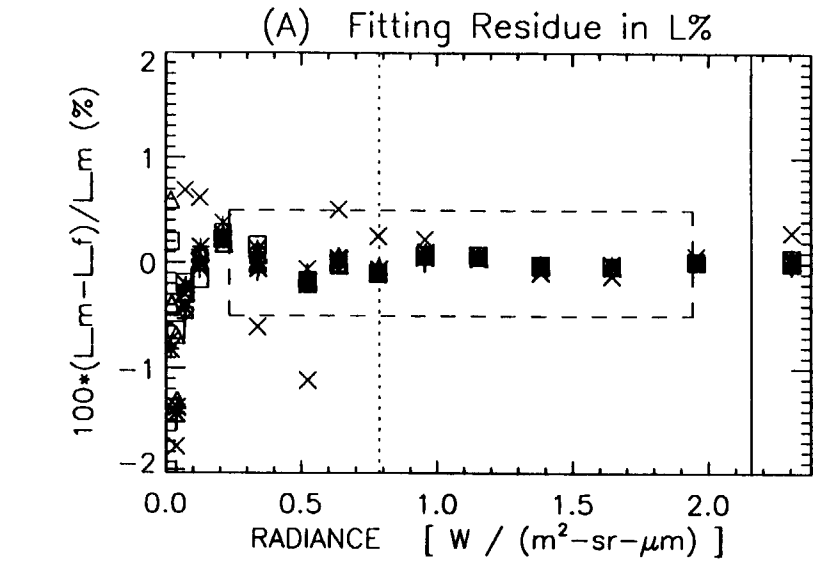


Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ    Ch5: Red ◇  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*    Ch10: Red Δ

Ltyp = 0.79 (Grn Dotted Line);    Lmax = 2.16 (Red Solid Line)  
 0.3Ltyp = 0.24;    0.9Lmax = 1.94 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D):    (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 250 (K) - 325 (K)  
 0.09Ltyp - 0.90Lmax

B23 L vs DN Cubic Fitting; Nominal Plateau 2 (273 K); UAID: 1595 - 1618

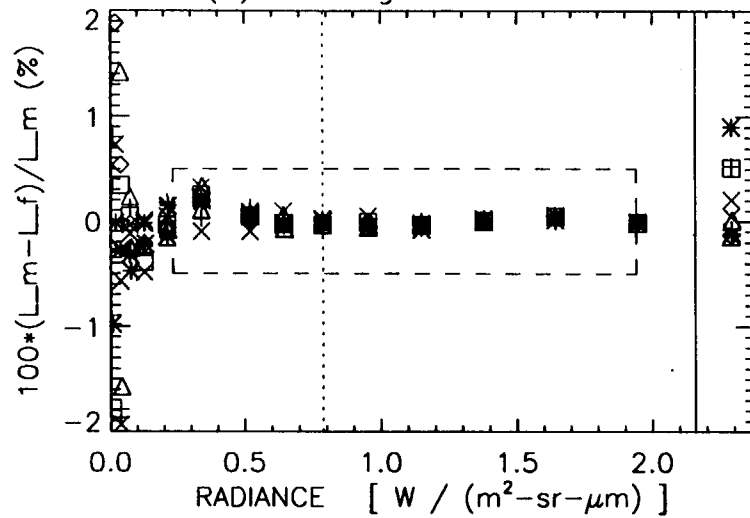


Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.79 (Grn Dotted Line); Lmax = 2.16 (Red Solid Line)  
 0.3Ltyp = 0.24; 0.9Lmax = 1.94 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

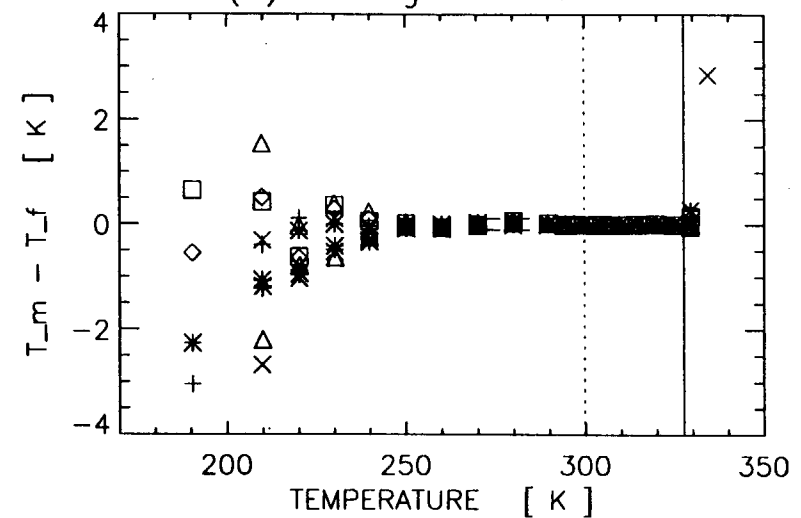
Fitting Range: 250 (K) - 325 (K)  
 0.09Ltyp - 0.91Lmax

B23 L vs DN Cubic Fitting; Hot Plateau (283 K); UAID: 1402 - 1426

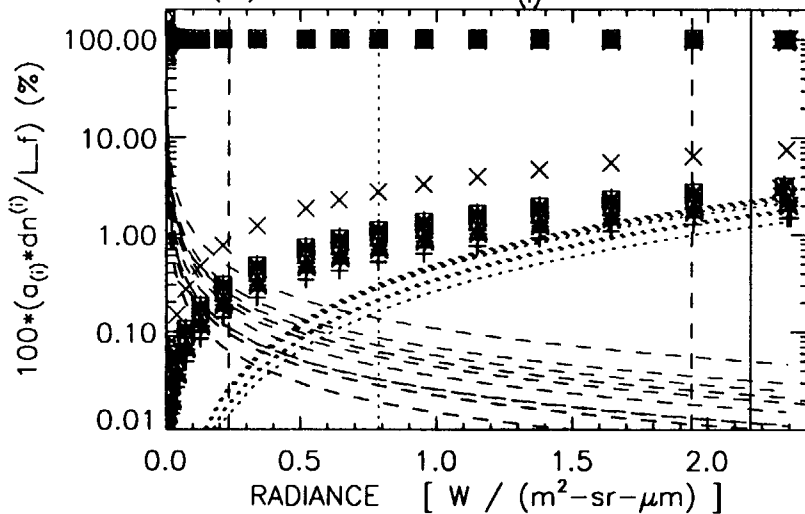
(A) Fitting Residue in L%



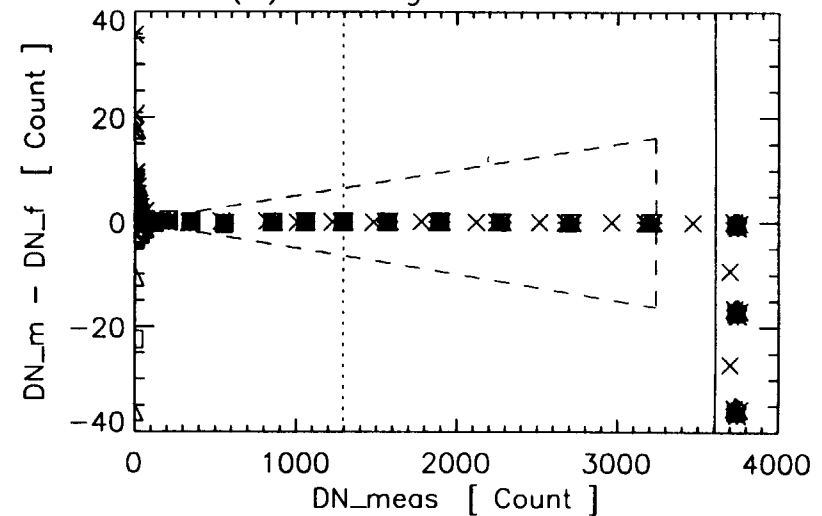
(B) Fitting Residue in T



(C) Coefficient  $a_{(i)}$  Contribution



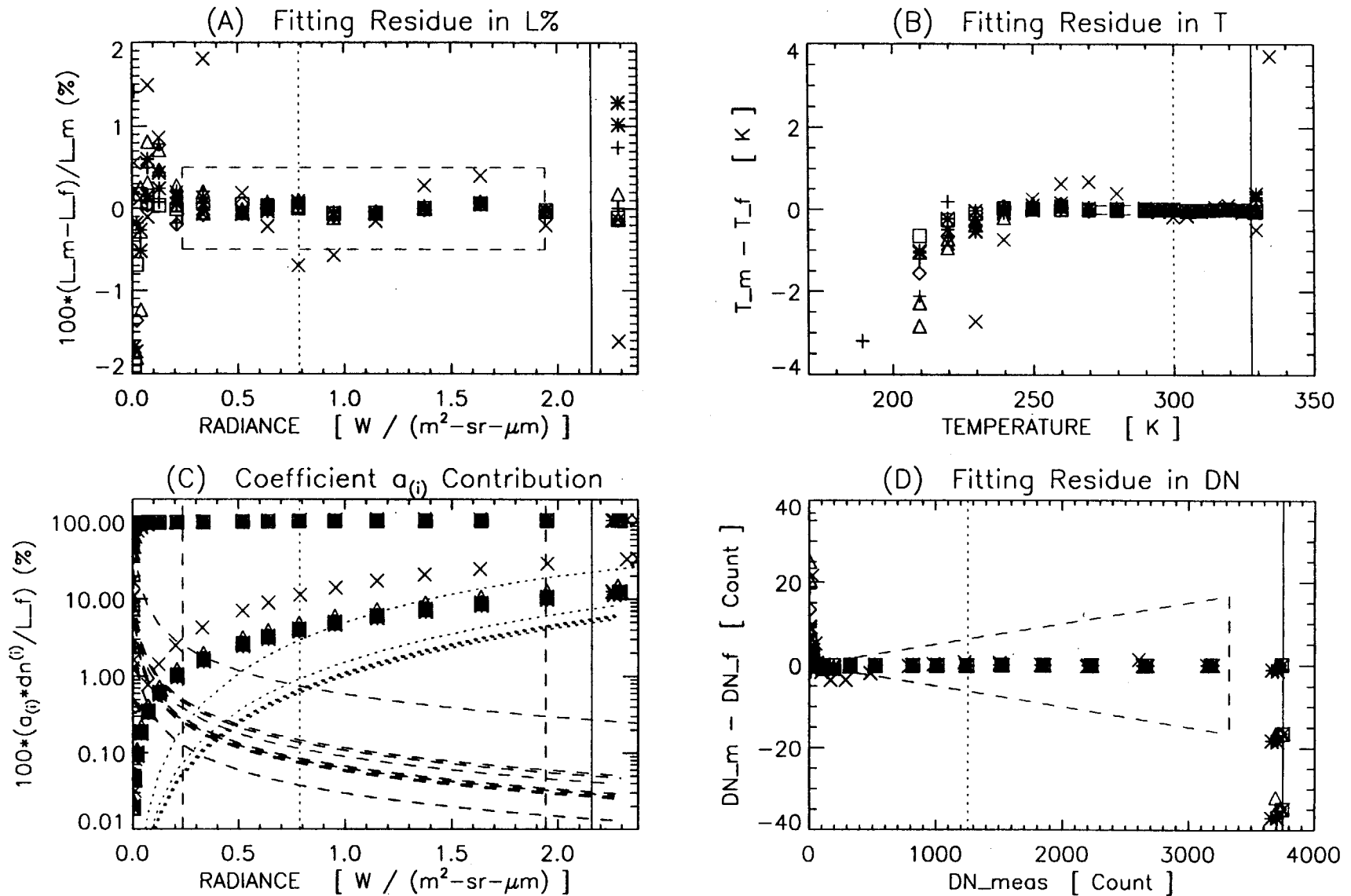
(D) Fitting Residue in DN



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.79 (Grn Dotted Line); Lmax = 2.16 (Red Solid Line)  
 0.3Ltyp = 0.24; 0.9Lmax = 1.94 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 250 (K) - 325 (K)  
 0.10Ltyp - 0.90Lmax

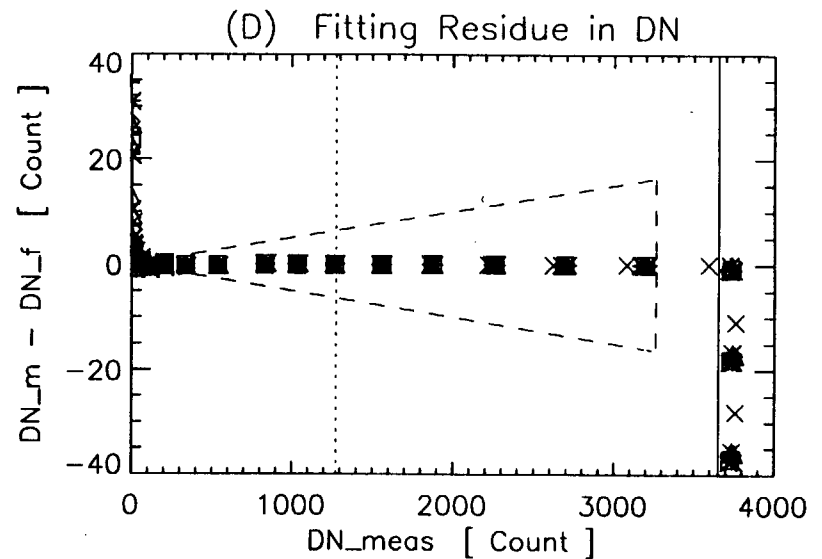
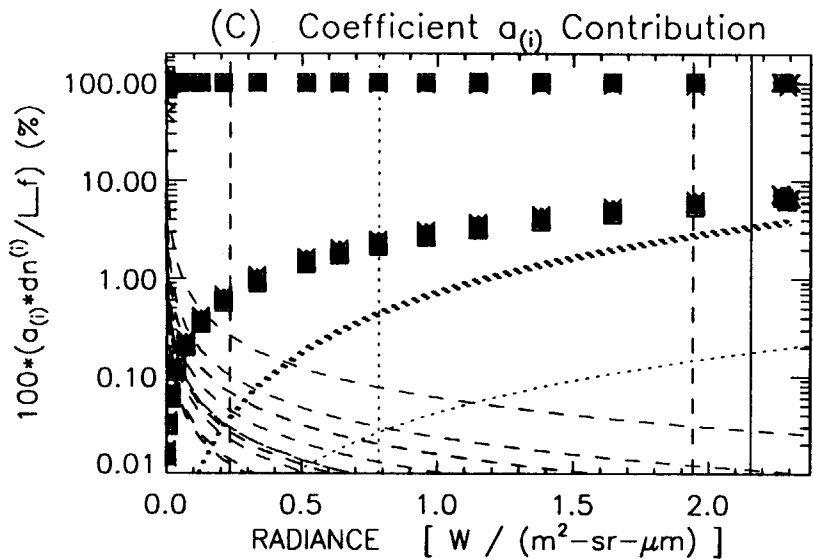
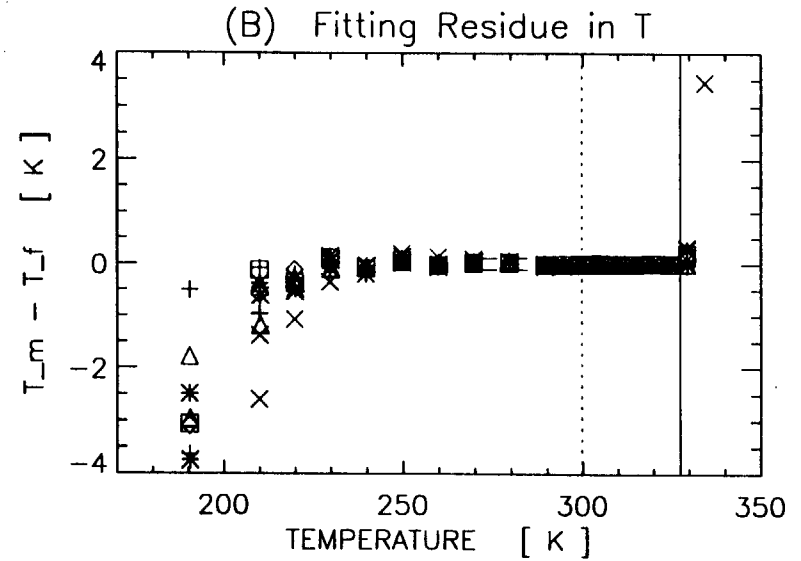
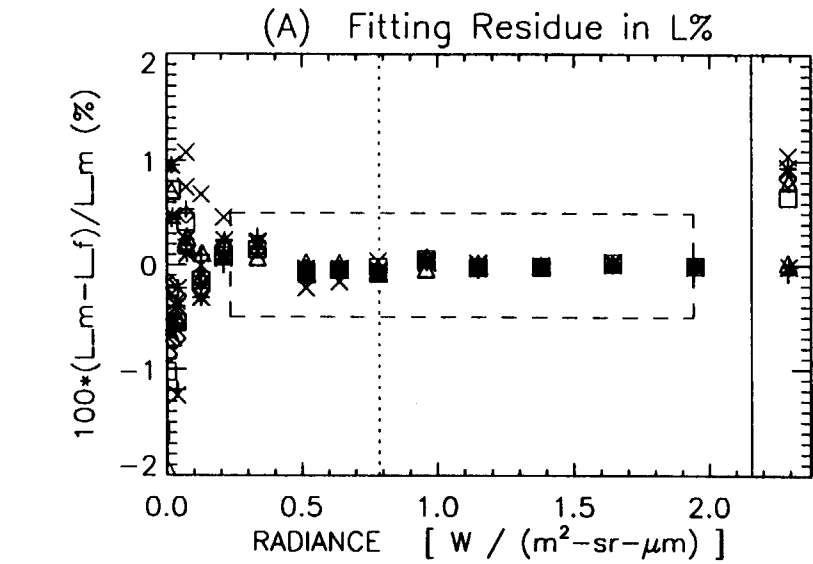
B23 L vs DN Cubic Fitting; Cold Plateau (256 K); UAID: 1315 - 1337



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.79 (Grn Dotted Line); Lmax = 2.16 (Red Solid Line)  
 0.3Ltyp = 0.24; 0.9Lmax = 1.94 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D):  $(0.3Ltyp - 0.9Lmax) \times \pm 1/2$  Goal\*

Fitting Range: 220 (K) - 325 (K)  
 0.01Ltyp - 0.90Lmax

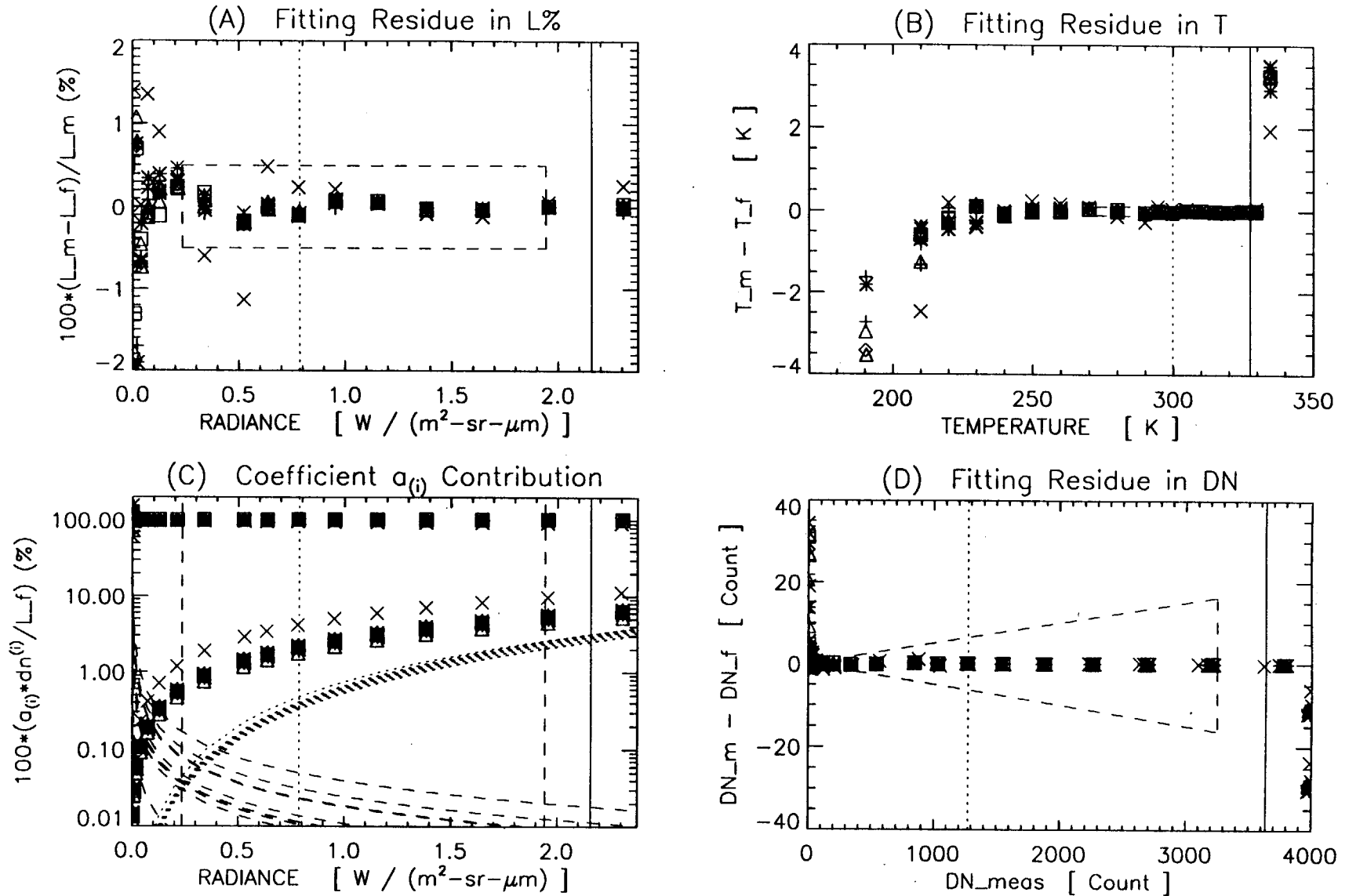
B23 L vs DN Cubic Fitting; Nominal Plateau 1 (273 K); UAID: 1506 - 1526



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.79 (Grn Dotted Line); Lmax = 2.16 (Red Solid Line)  
 0.3Ltyp = 0.24; 0.9Lmax = 1.94 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 220 (K) - 325 (K)  
 0.01Ltyp - 0.90Lmax

B23 L vs DN Cubic Fitting; Nominal Plateau 2 (273 K); UAID: 1595 - 1618

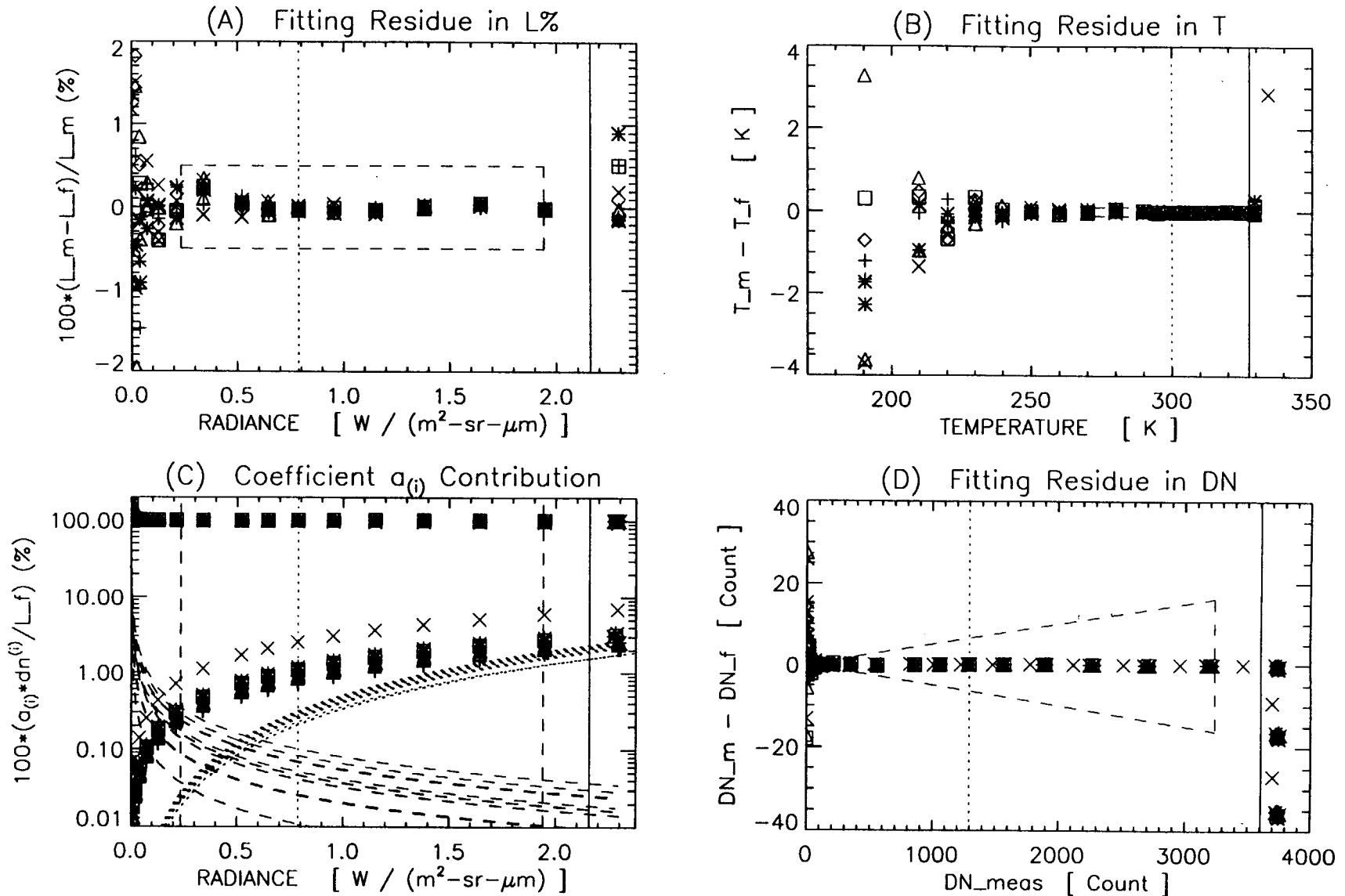


Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.79 (Grn Dotted Line); Lmax = 2.16 (Red Solid Line)  
 0.3Ltyp = 0.24; 0.9Lmax = 1.94 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D):  $(0.3Ltyp - 0.9Lmax) \times \pm 1/2$  Goal\*

Fitting Range: 220 (K) - 325 (K)  
 0.01Ltyp - 0.91Lmax



B23 L vs DN Cubic Fitting; Hot Plateau (283 K); UAID: 1402 – 1426



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk  $\Delta$  Ch5: Red  $\diamond$   
 Ch6: Grn  $\square$  Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red  $\Delta$   
 Ltyp = 0.79 (Grn Dotted Line); Lmax = 2.16 (Red Solid Line)  
 0.3Ltyp = 0.24; 0.9Lmax = 1.94 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D):  $(0.3Ltyp - 0.9Lmax) \times \pm 1/2$  Goal\*

Fitting Range: 220 (K) – 325 (K)  
 0.01Ltyp – 0.90Lmax

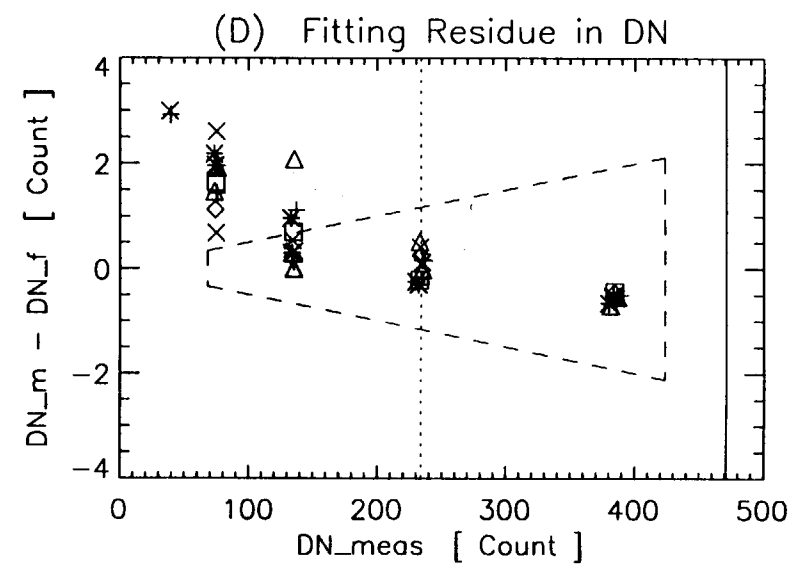
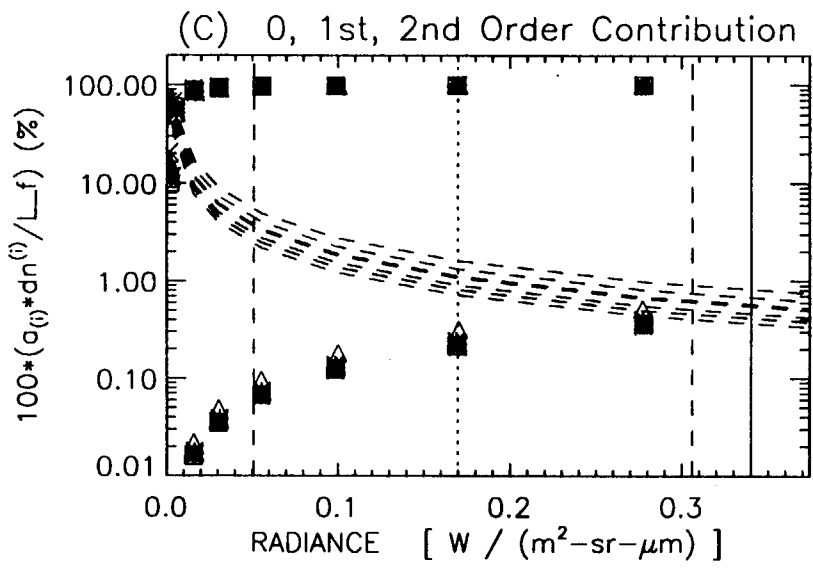
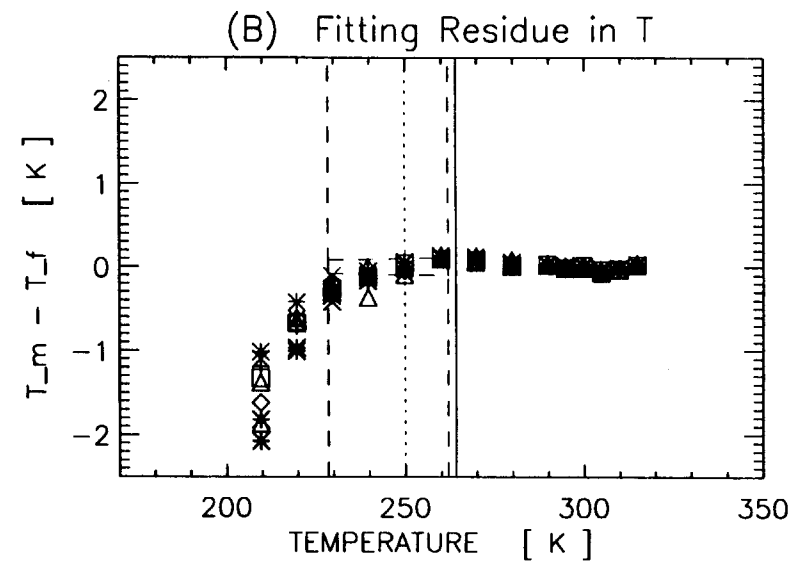
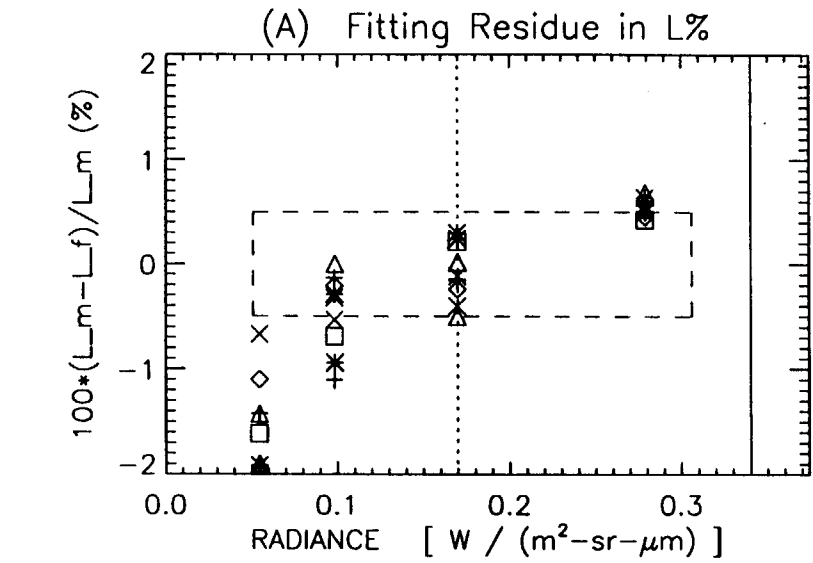


# Band 24 Calibration Fitting Summary



Instrument Temperature	# of BCS levels used	Cold Plateau (256K)	Nominal 1 (273K)	Nominal 2 (273K)	Hot Plateau (283K)
Quadratic Fitting (220 K - 315 K)	13				

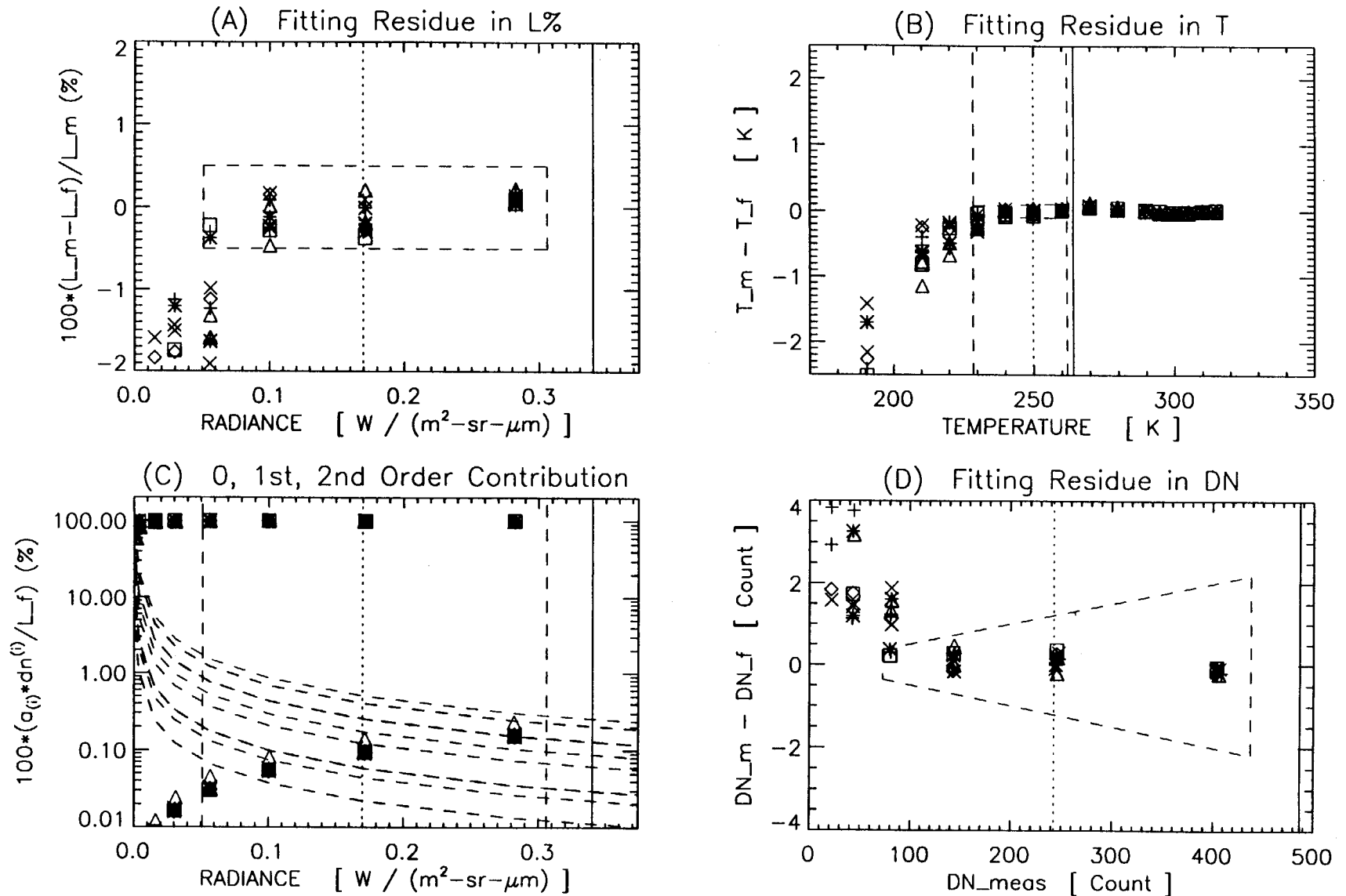
B24 L vs DN Quadratic Fitting; Cold Plateau (256 K); UAID: 1315 - 1337



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.17 (Grn Dotted Line); Lmax = 0.34 (Red Solid Line)  
 0.3Ltyp = 0.05; 0.9Lmax = 0.31 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 220 (K) - 315 (K)  
 0.17Ltyp - 7.09Lmax

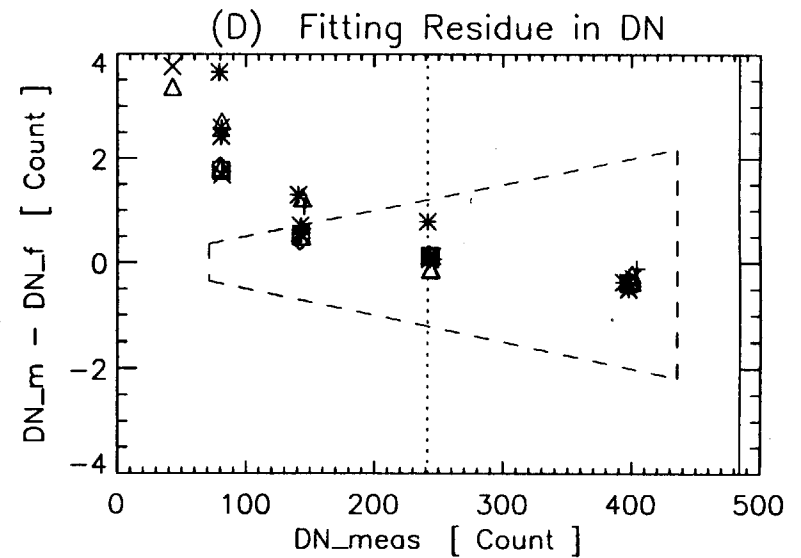
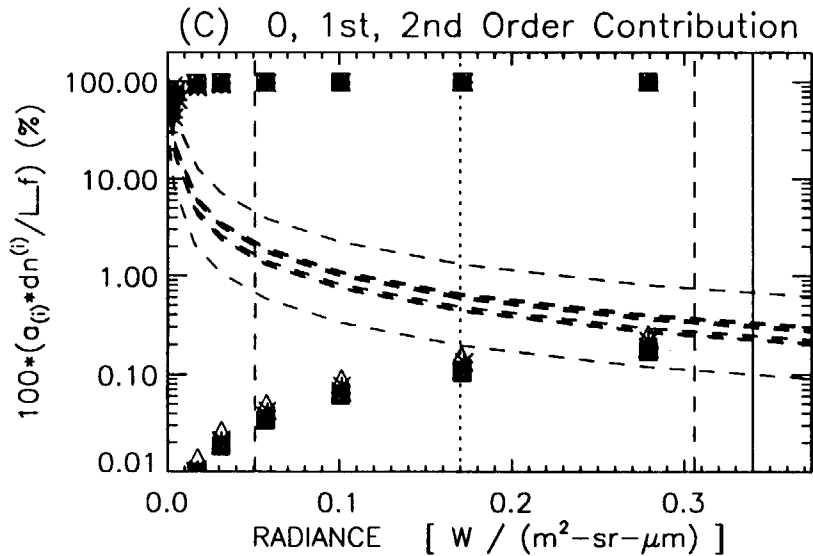
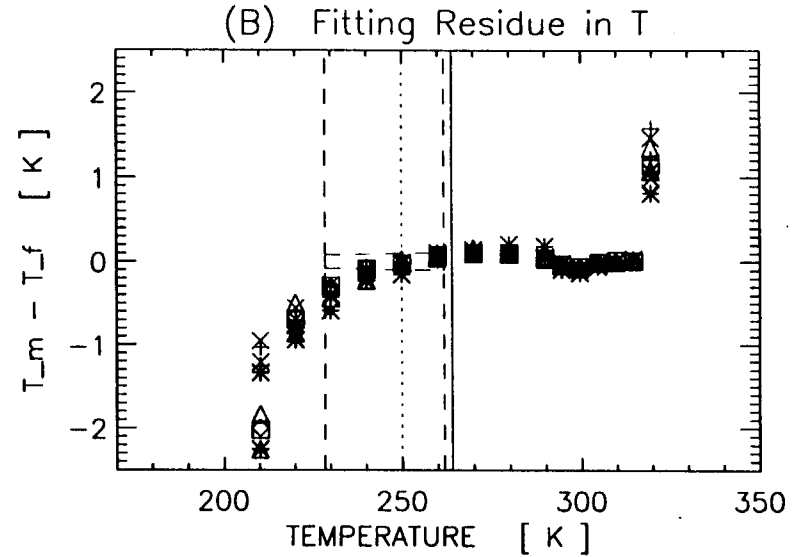
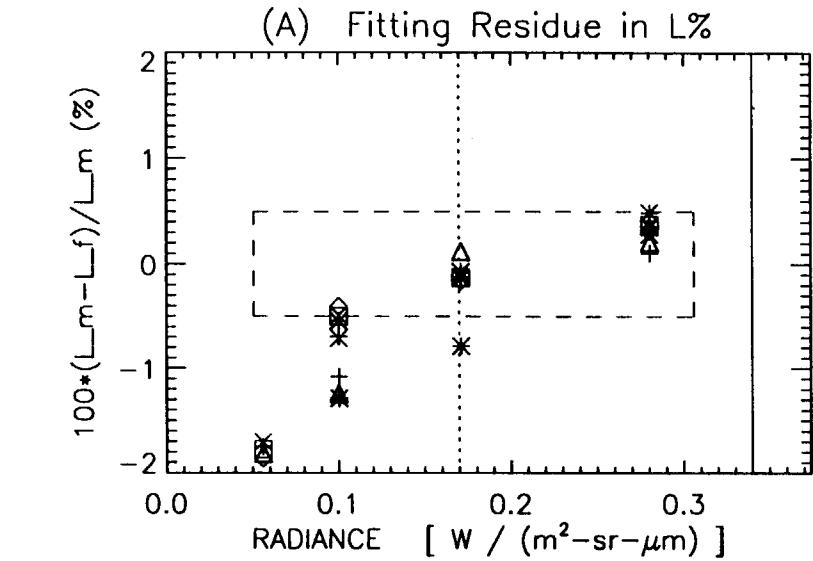
B24 L vs DN Quadratic Fitting; Nominal Plateau 1 (273 K); UAID: 1506 - 1526



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.17 (Grn Dotted Line); Lmax = 0.34 (Red Solid Line)  
 0.3Ltyp = 0.05; 0.9Lmax = 0.31 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 220 (K) - 315 (K)  
 0.18Ltyp - 7.12Lmax

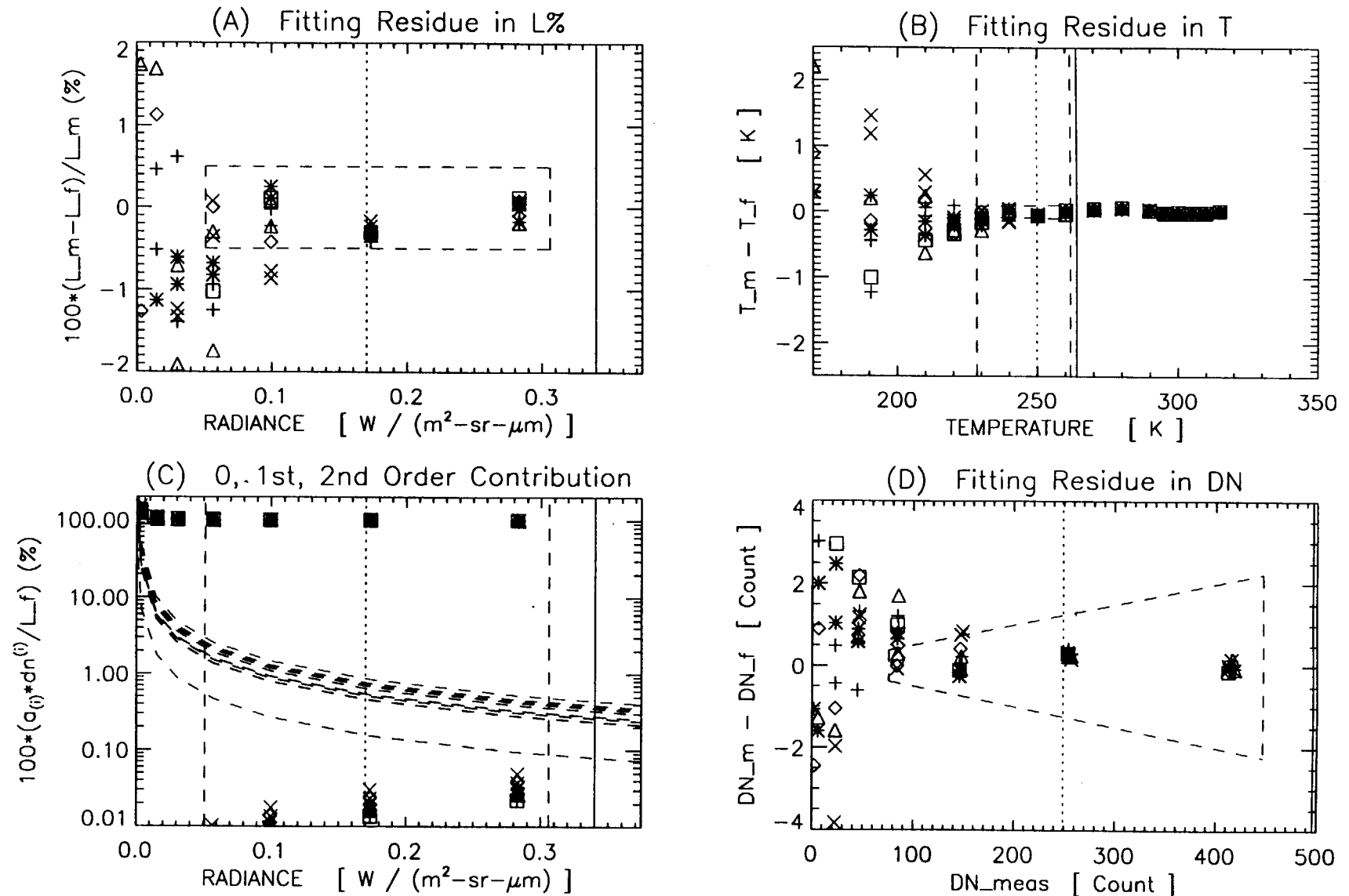
B24 L vs DN Quadratic Fitting; Nominal Plateau 2 (273 K); UAID: 1595 - 1618



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.17 (Grn Dotted Line); Lmax = 0.34 (Red Solid Line)  
 0.3Ltyp = 0.05; 0.9Lmax = 0.31 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 220 (K) - 315 (K)  
 0.18Ltyp - 7.13Lmax

B24 L vs DN Quadratic Fitting; Hot Plateau (283 K); UAID: 1402 - 1426



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.17 (Grn Dotted Line); Lmax = 0.34 (Red Solid Line)  
 0.3Ltyp = 0.05; 0.9Lmax = 0.31 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 220 (K) - 315 (K)  
 0.18Ltyp - 7.11Lmax

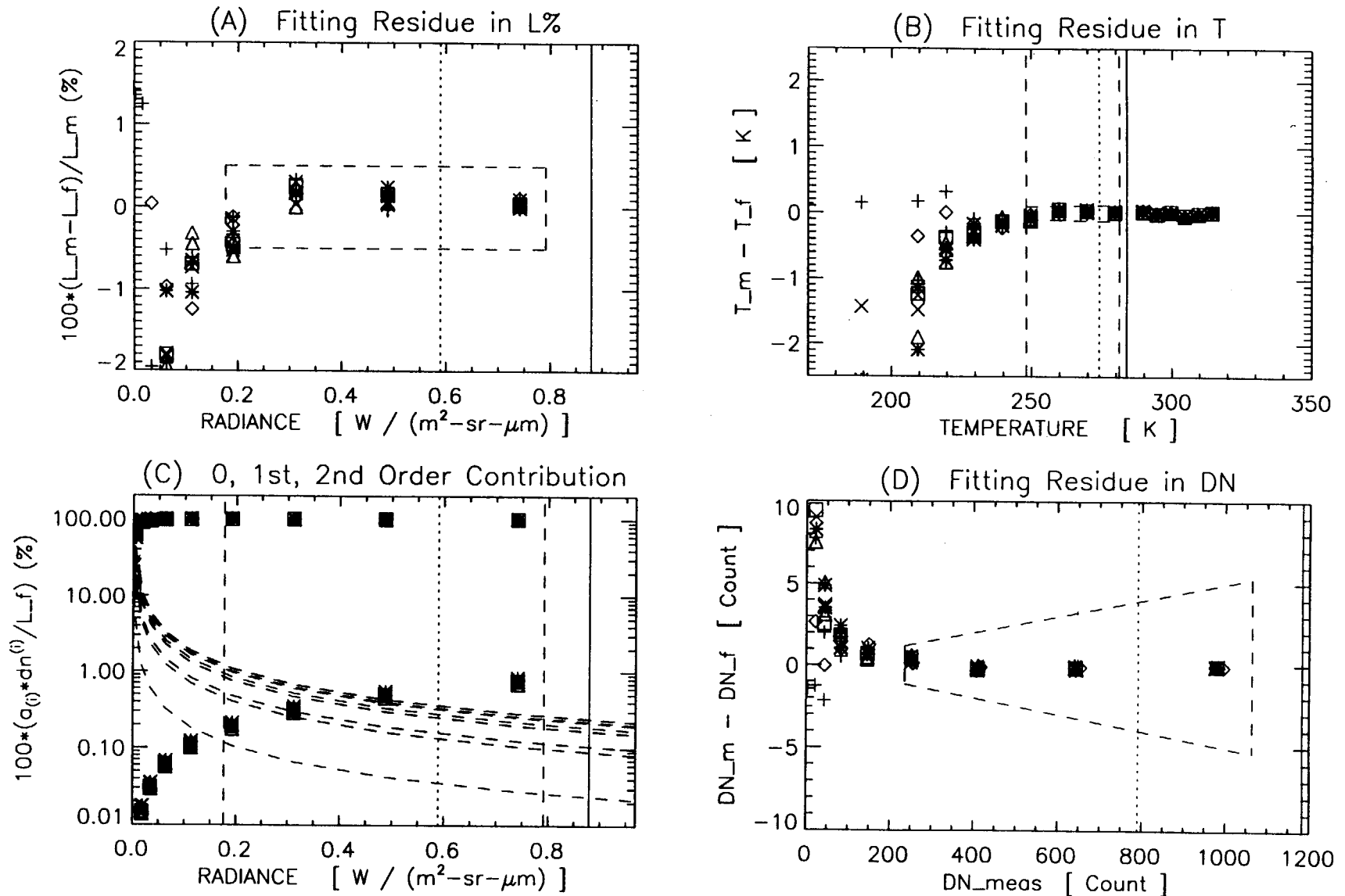


# Band 25 Calibration Fitting Summary



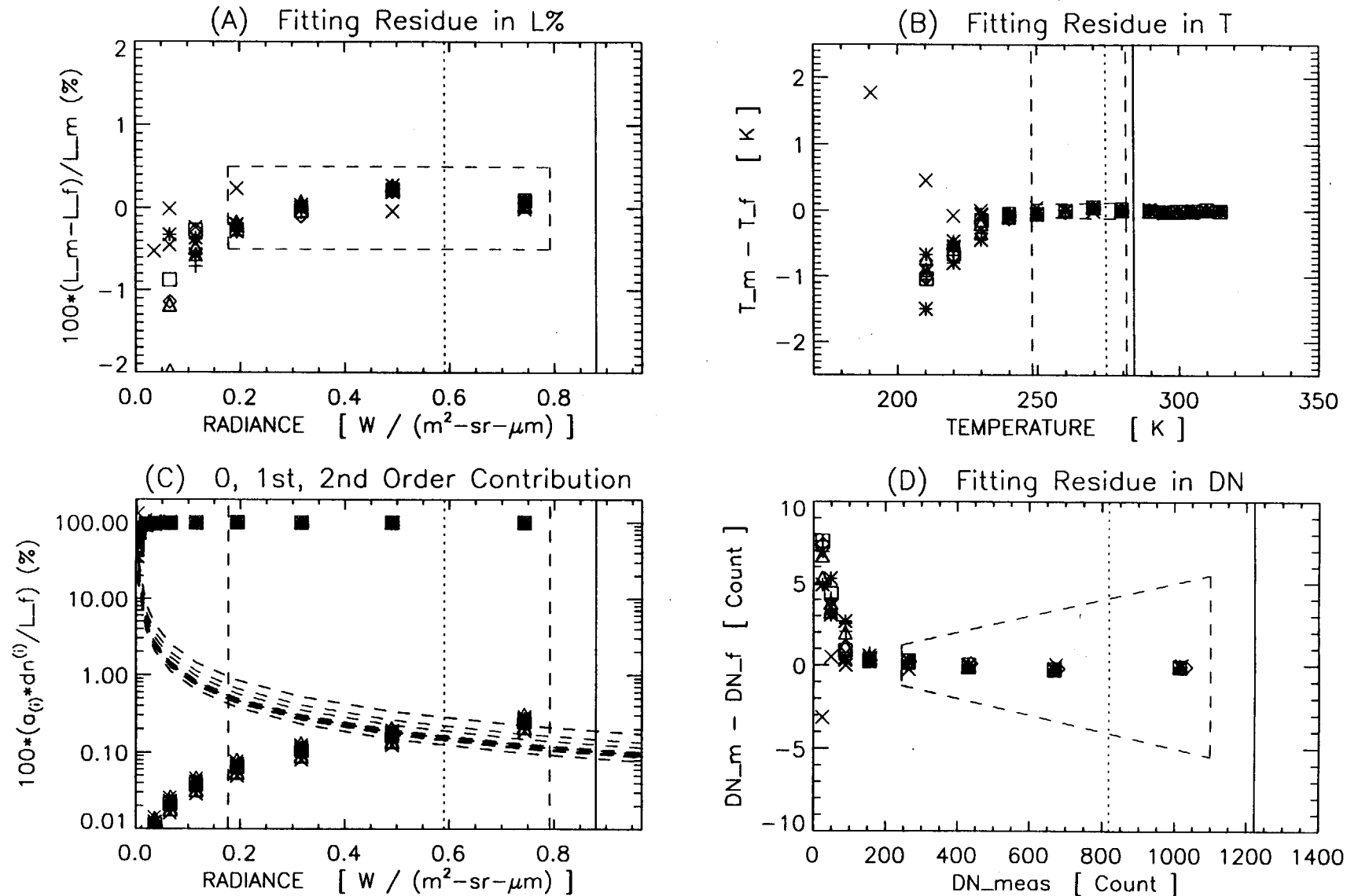
Instrument Temperature	# of BCS levels used	Cold Plateau (256K)	Nominal 1 (273K)	Nominal 2 (273K)	Hot Plateau (283K)
Quadratic Fitting (240 K - 315 K)	11				

B25 L vs DN Quadratic Fitting; Cold Plateau (256 K); UAID: 1315 - 1337





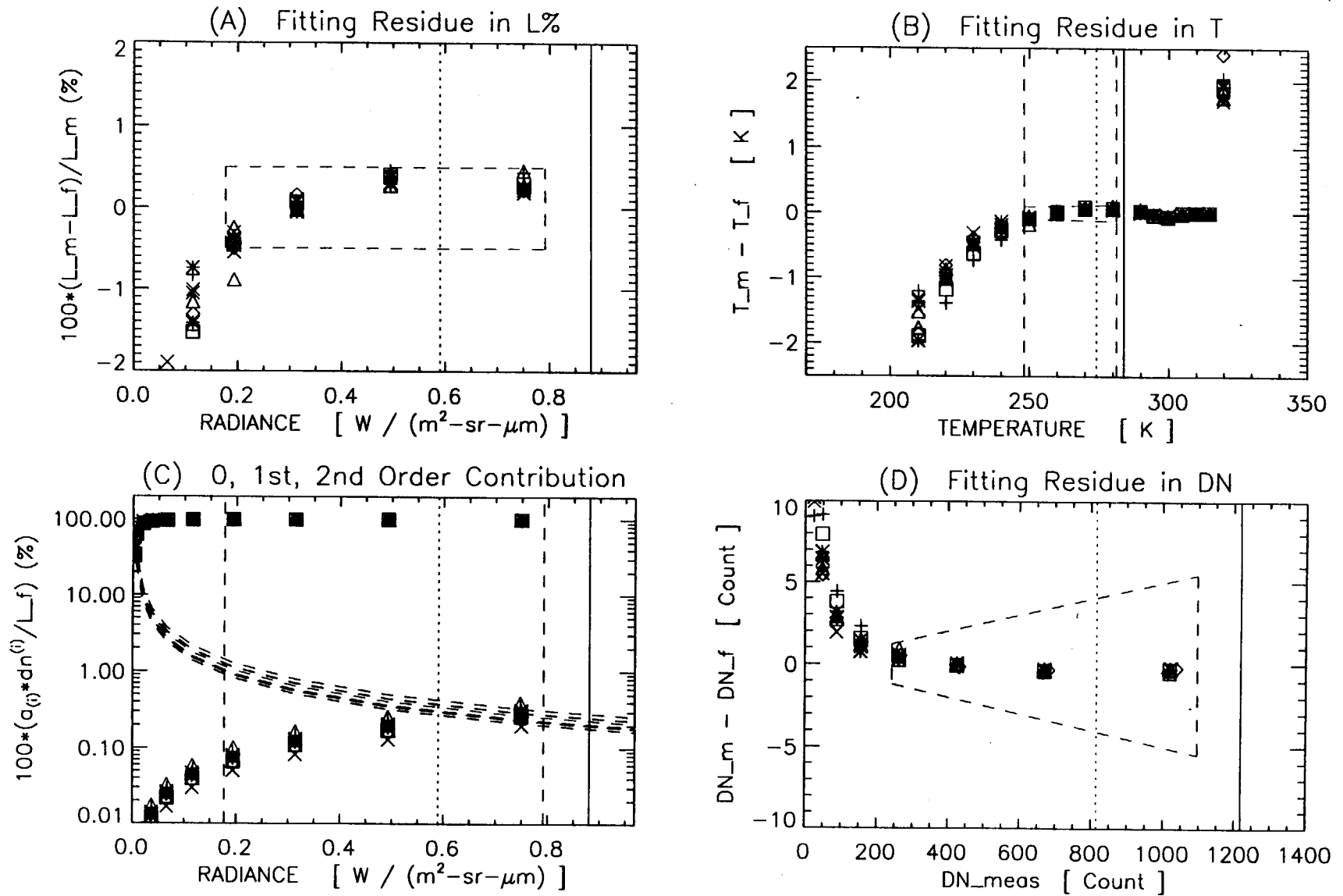
B25 L vs DN Quadratic Fitting; Nominal Plateau 1 (273 K); UAID: 1506 – 1526



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.59 (Grn Dotted Line); Lmax = 0.88 (Red Solid Line)  
 0.3Ltyp = 0.18; 0.9Lmax = 0.79 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp – 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 240 (K) – 315 (K)  
 0.19Ltyp – 2.98Lmax

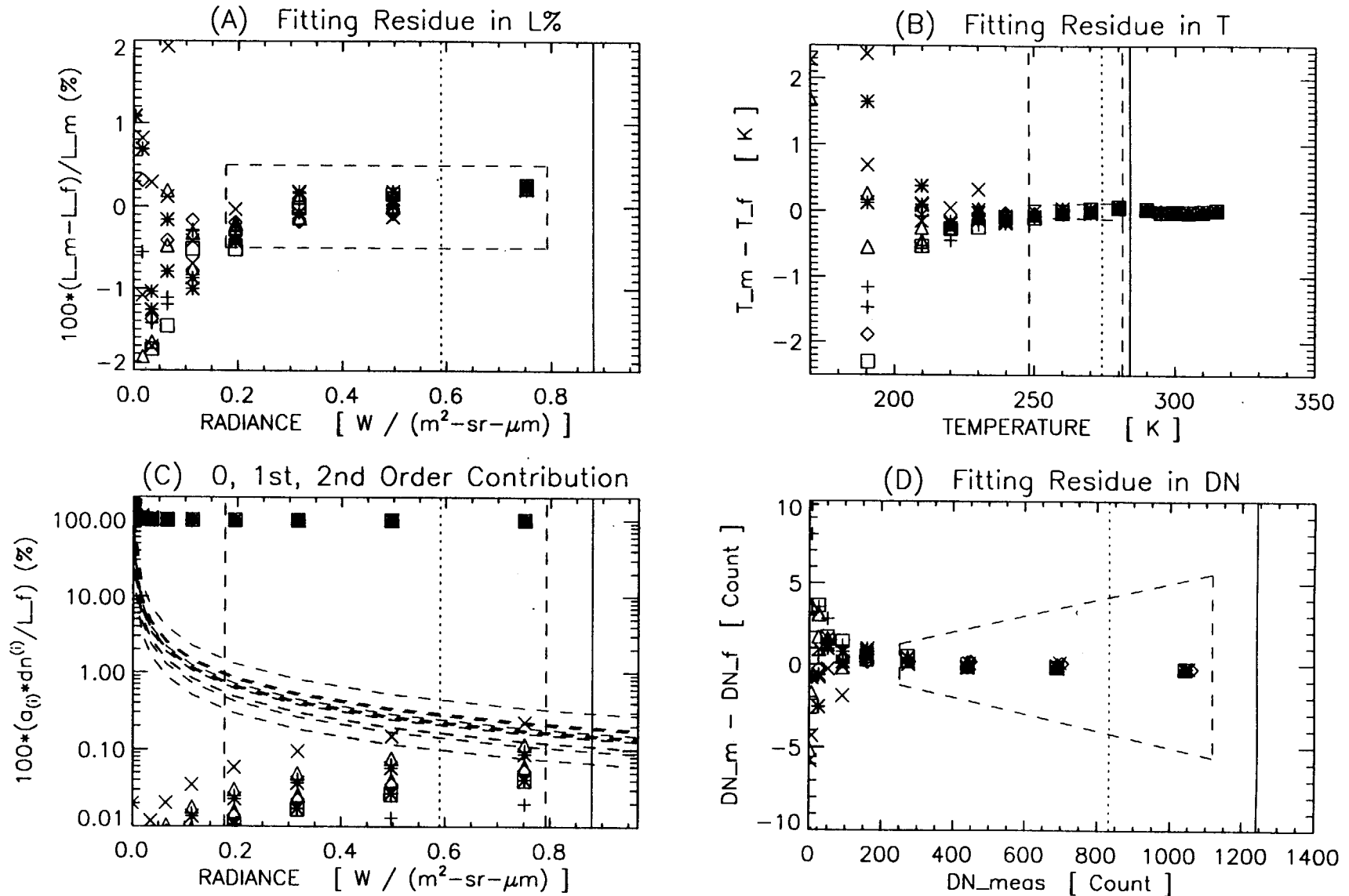
B25 L vs DN Quadratic Fitting; Nominal Plateau 2 (273 K); UAID: 1595 - 1618



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.59 (Grn Dotted Line); Lmax = 0.88 (Red Solid Line)  
 0.3Ltyp = 0.18; 0.9Lmax = 0.79 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 240 (K) - 315 (K)  
 0.19Ltyp - 2.98Lmax

B25 L vs DN Quadratic Fitting; Hot Plateau (283 K); UAID: 1402 - 1426



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 0.59 (Grn Dotted Line); Lmax = 0.88 (Red Solid Line)  
 0.3Ltyp = 0.18; 0.9Lmax = 0.79 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 240 (K) - 315 (K)  
 0.19Ltyp - 2.97Lmax

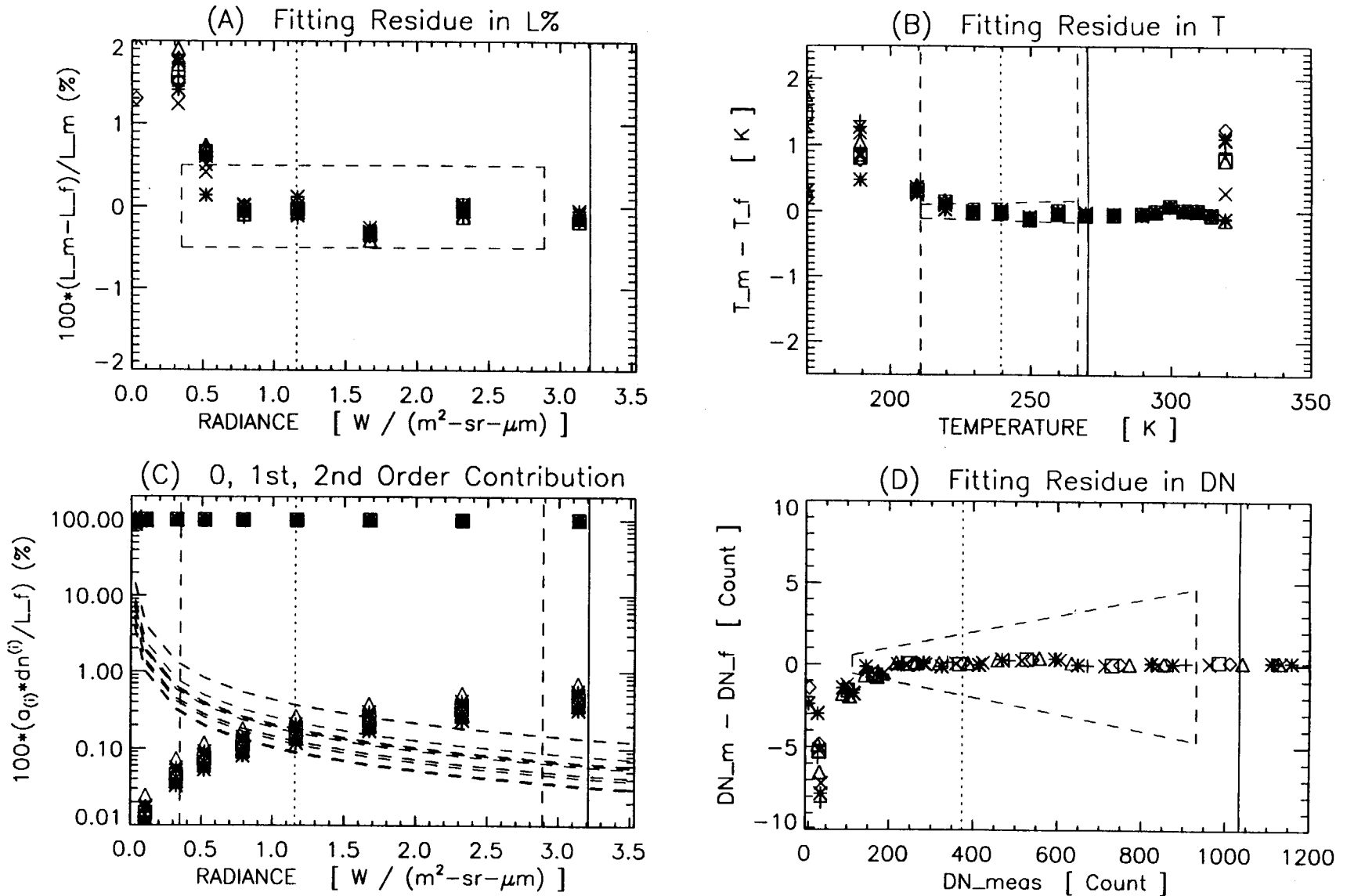


# Band 27 Calibration Fitting Summary



Instrument Temperature	# of BCS levels used	Cold Plateau (256K)	Nominal 1 (273K)	Nominal 2 (273K)	Hot Plateau (283K)
Quadratic Fitting (210 K - 315 K)	14				

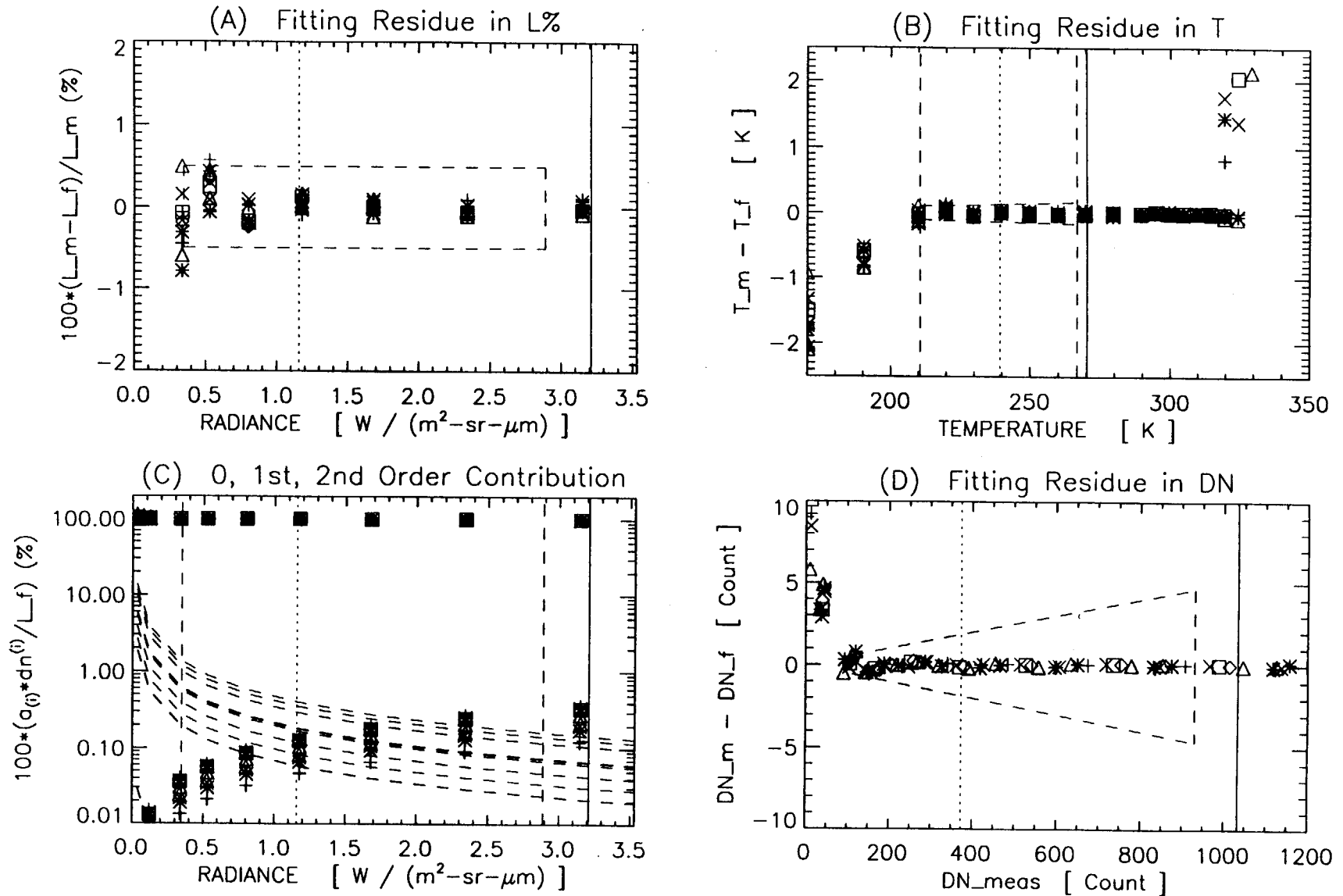
B27 L vs DN Quadratic Fitting; Cold Plateau (256 K); UAID: 1315 - 1337



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 1.16 (Grn Dotted Line); Lmax = 3.21 (Red Solid Line)  
 0.3Ltyp = 0.35; 0.9Lmax = 2.89 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 210 (K) - 315 (K)  
 0.28Ltyp - 3.01Lmax

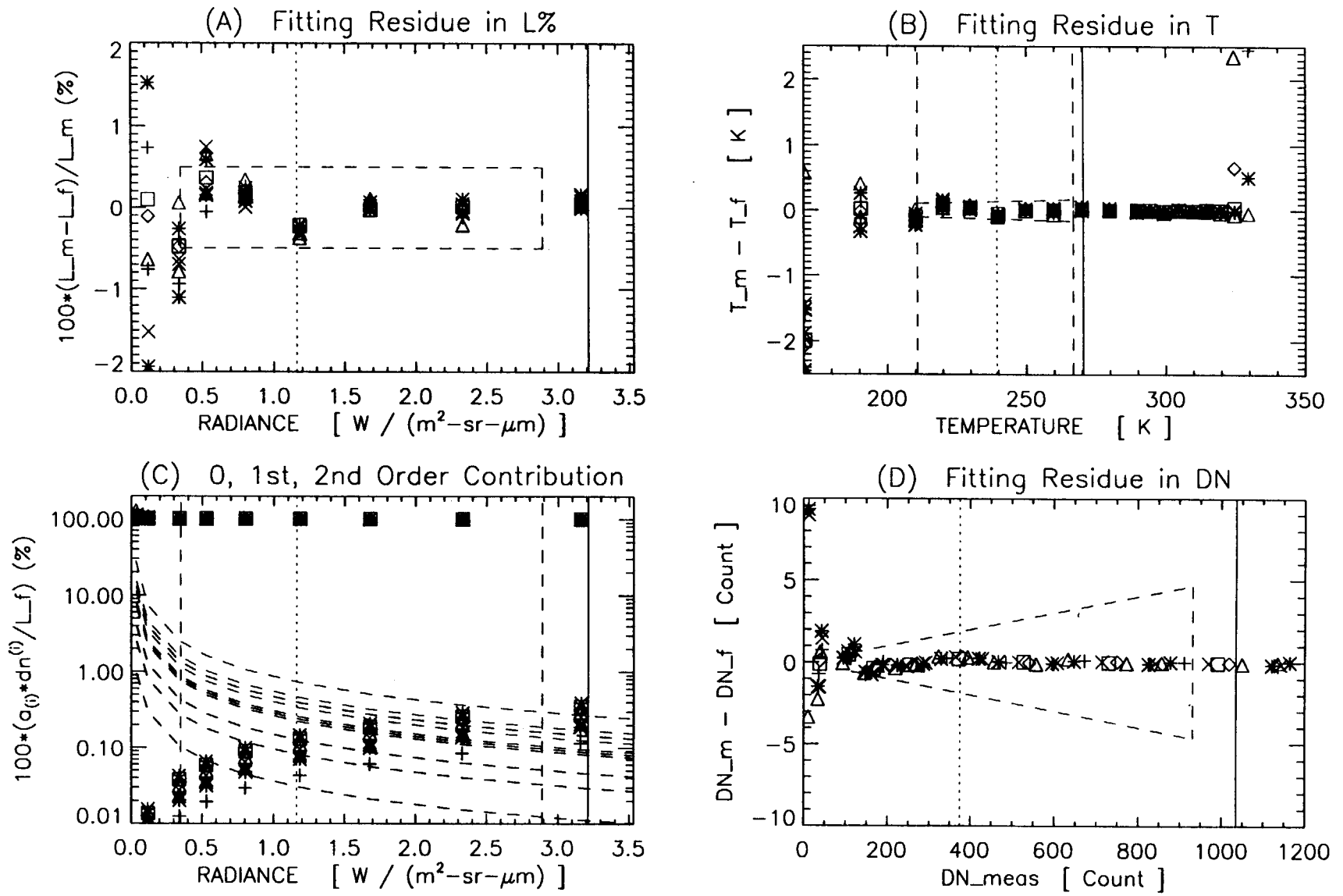
B27 L vs DN Quadratic Fitting; Nominal Plateau 1 (273 K); UAID: 1506 – 1526



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 1.16 (Grn Dotted Line); Lmax = 3.21 (Red Solid Line)  
 0.3Ltyp = 0.35; 0.9Lmax = 2.89 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 210 (K) – 315 (K)  
 0.29Ltyp - 3.02Lmax

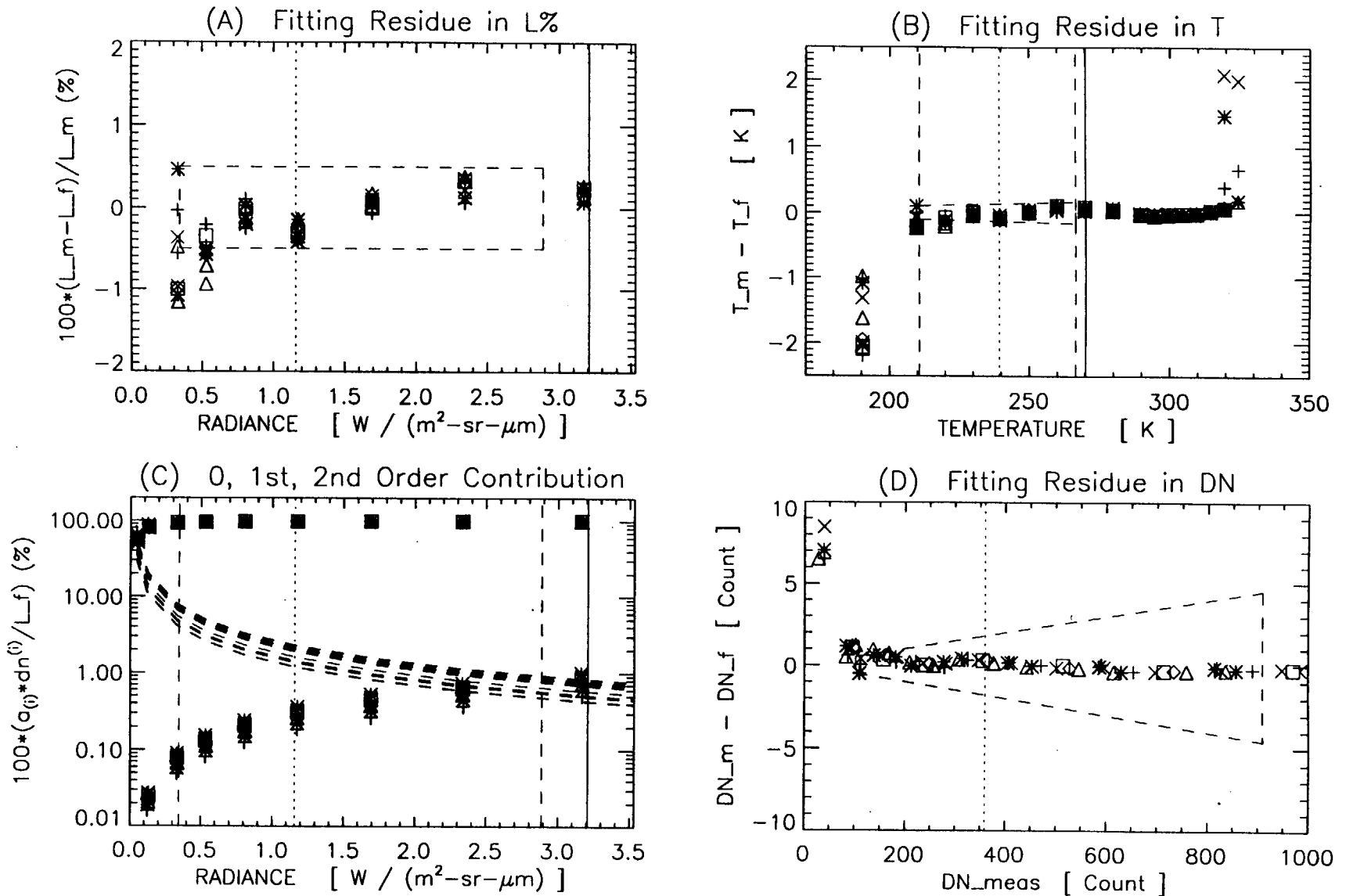
B27 L vs DN Quadratic Fitting; Nominal Plateau 2 (273 K); UAID: 1595 - 1618



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 1.16 (Grn Dotted Line); Lmax = 3.21 (Red Solid Line)  
 0.3Ltyp = 0.35; 0.9Lmax = 2.89 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 210 (K) - 315 (K)  
 0.29Ltyp - 3.02Lmax

B27 L vs DN Quadratic Fitting; Hot Plateau (283 K); UAID: 1402 - 1426

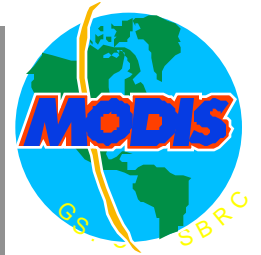


Fitting Range: 210 (K) - 315 (K)  
 0.29Ltyp - 3.02Lmax



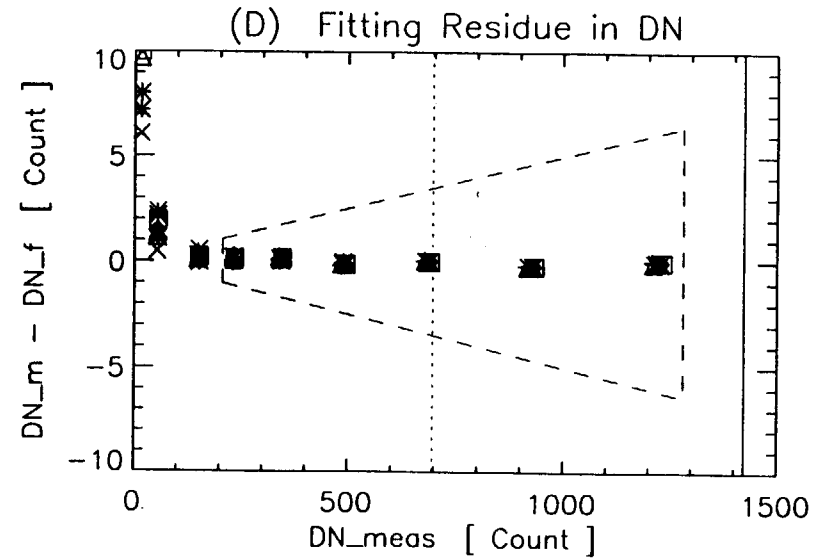
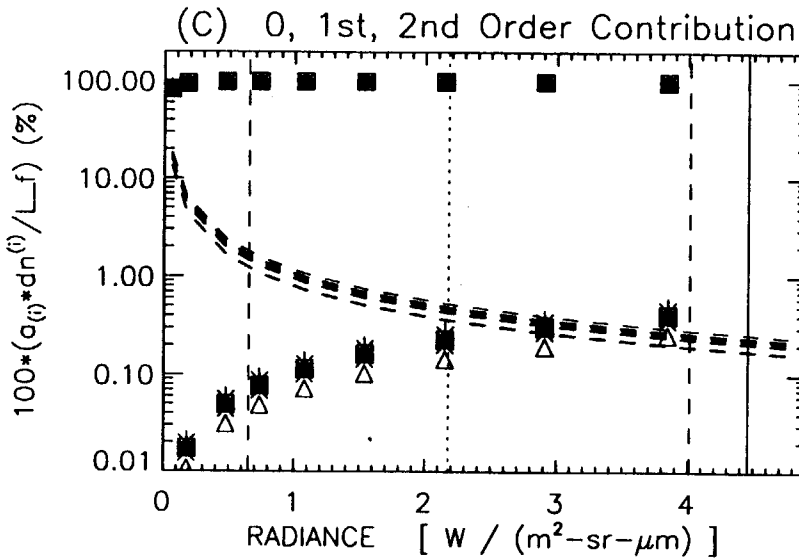
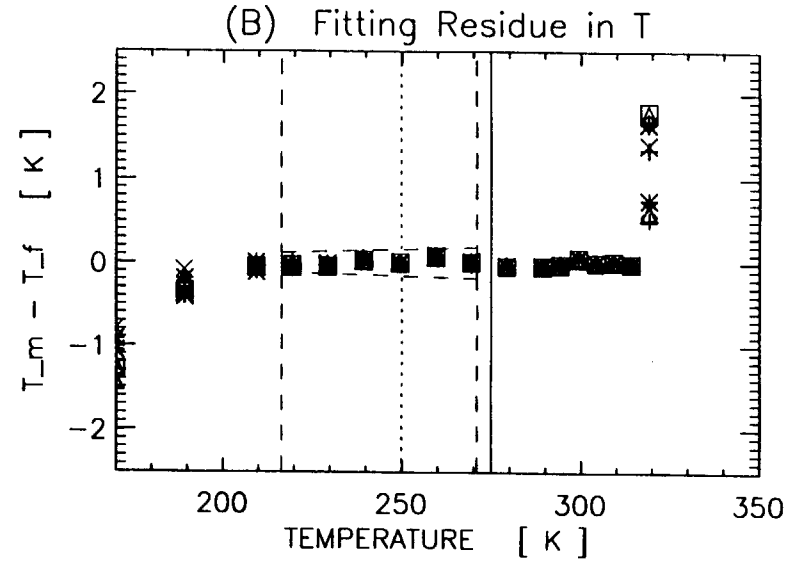
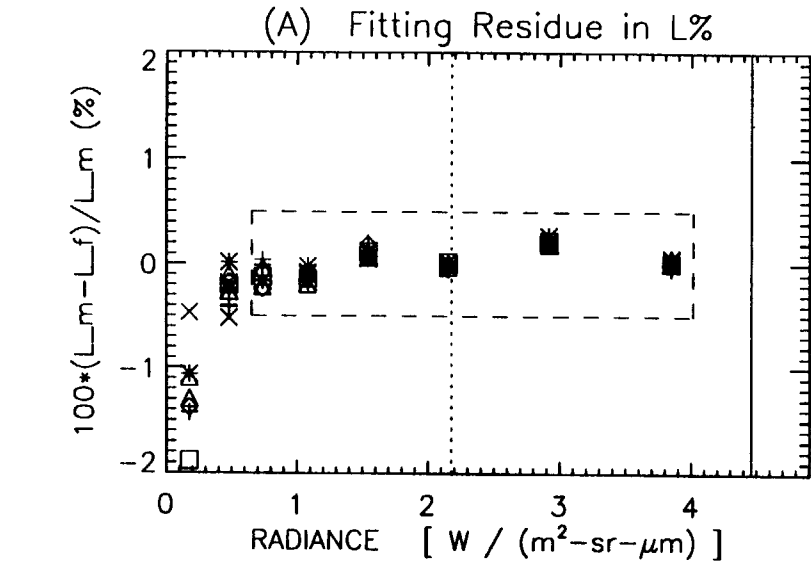


# Band 28 Calibration Fitting Summary



Instrument Temperature	# of BCS levels used	Cold Plateau (256K)	Nominal 1 (273K)	Nominal 2 (273K)	Hot Plateau (283K)
Quadratic Fitting (210 K - 315 K)	14				

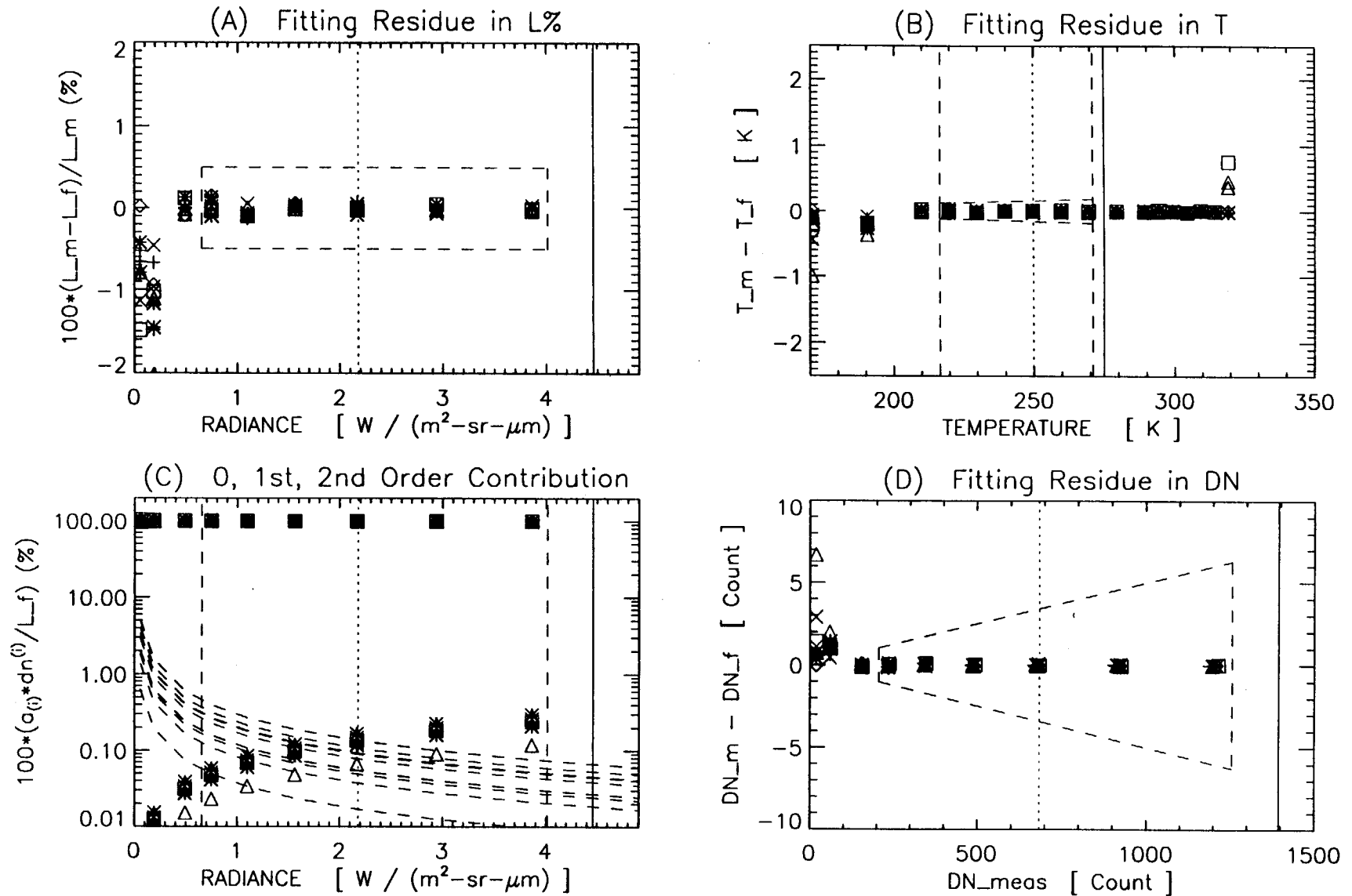
B28 L vs DN Quadratic Fitting; Cold Plateau (256 K); UAID: 1315 - 1337



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 2.18 (Grn Dotted Line); Lmax = 4.46 (Red Solid Line)  
 0.3Ltyp = 0.65; 0.9Lmax = 4.01 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 210 (K) - 315 (K)  
 0.22Ltyp - 2.44Lmax

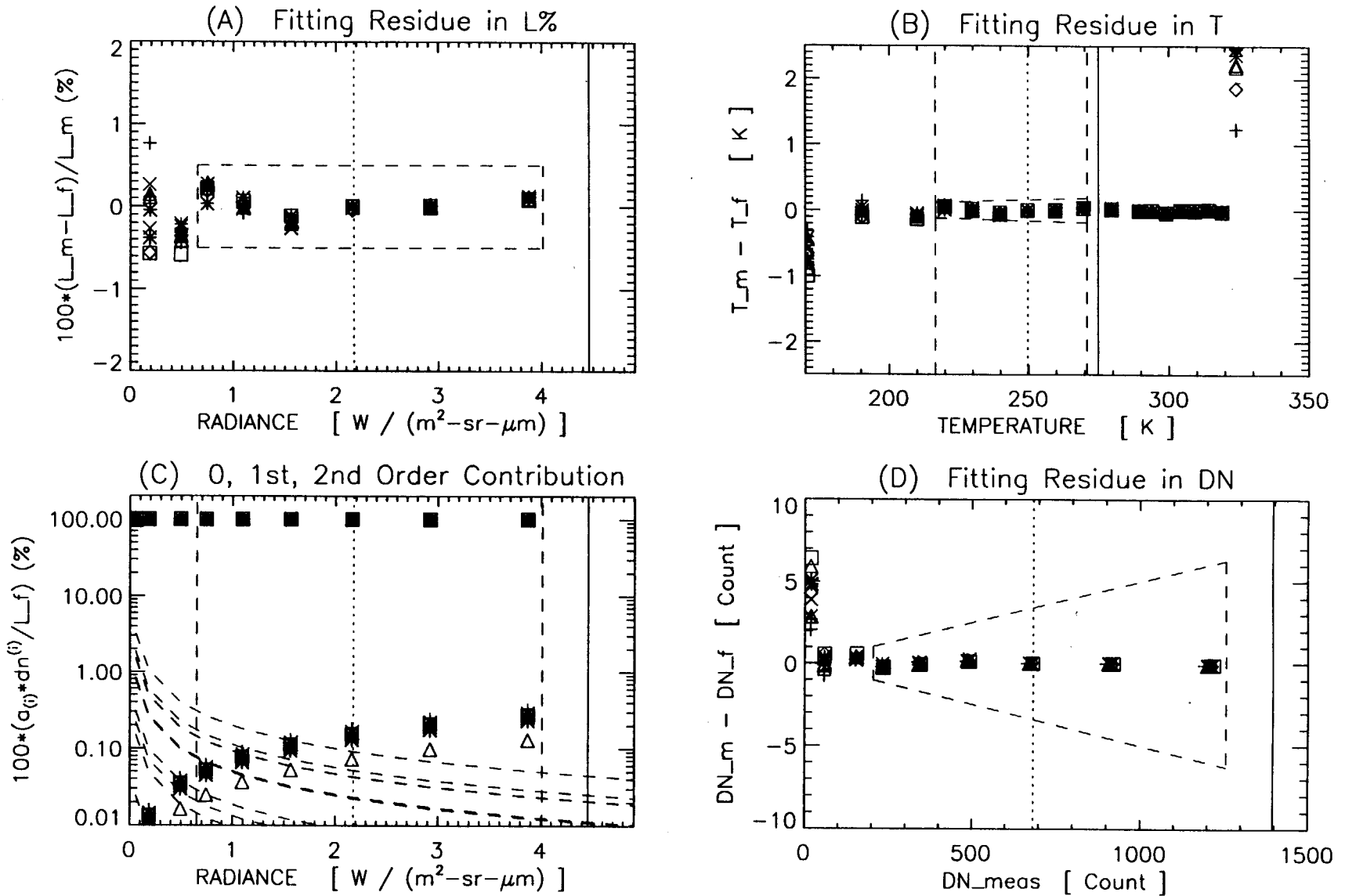
B28 L vs DN Quadratic Fitting; Nominal Plateau 1 (273 K); UAID: 1506 – 1526



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 2.18 (Grn Dotted Line); Lmax = 4.46 (Red Solid Line)  
 0.3Ltyp = 0.65; 0.9Lmax = 4.01 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 210 (K) - 315 (K)  
 0.23Ltyp - 2.45Lmax

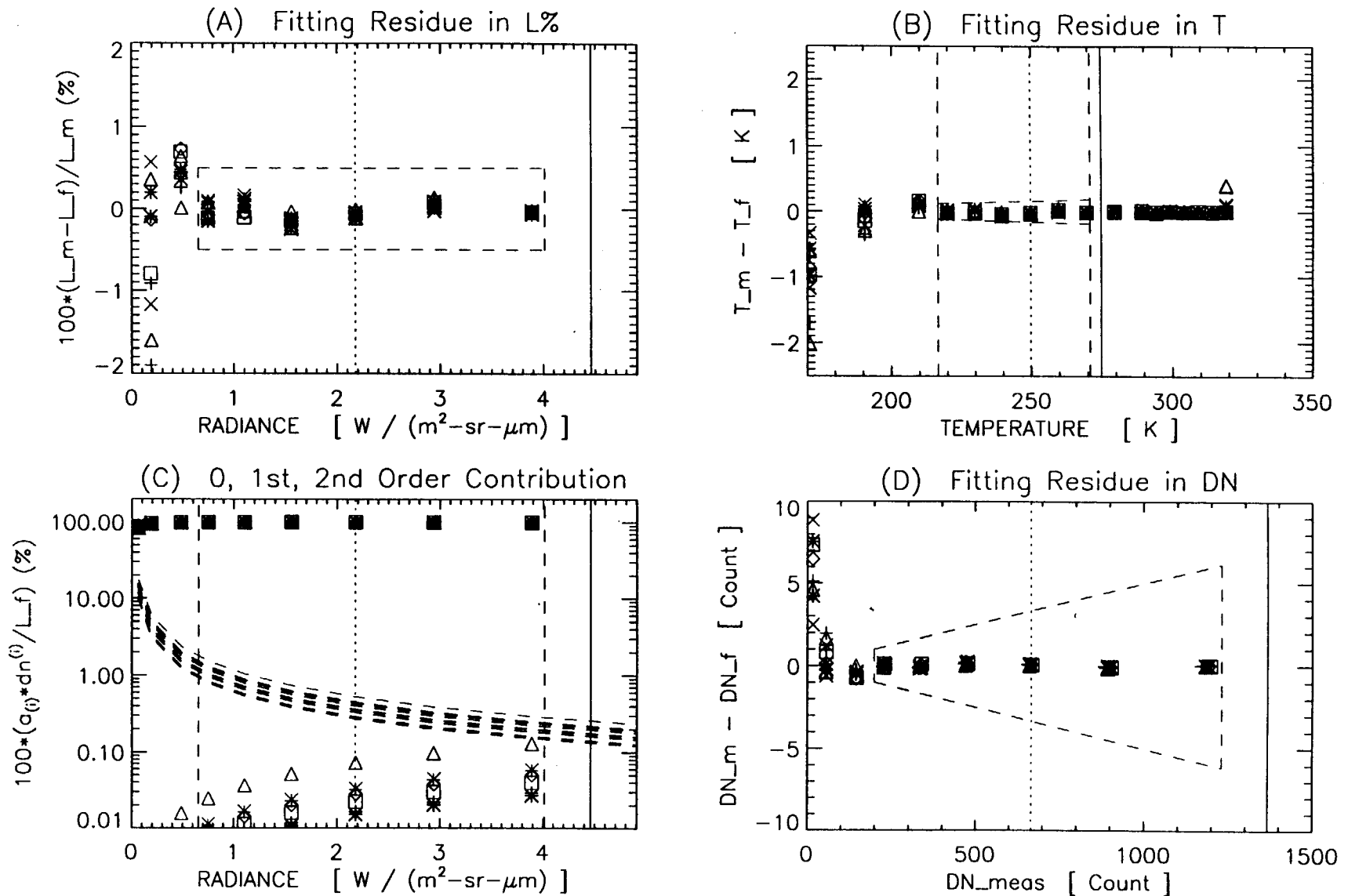
B28 L vs DN Quadratic Fitting; Nominal Plateau 2 (273 K); UAID: 1595 - 1618



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 2.18 (Grn Dotted Line); Lmax = 4.46 (Red Solid Line)  
 0.3Ltyp = 0.65; 0.9Lmax = 4.01 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 210 (K) - 315 (K)  
 0.23Ltyp - 2.45Lmax

B28 L vs DN Quadratic Fitting; Hot Plateau (283 K); UAID: 1402 - 1426



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 2.18 (Grn Dotted Line); Lmax = 4.46 (Red Solid Line)  
 0.3Ltyp = 0.65; 0.9Lmax = 4.01 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 210 (K) - 315 (K)  
 0.22Ltyp - 2.44Lmax

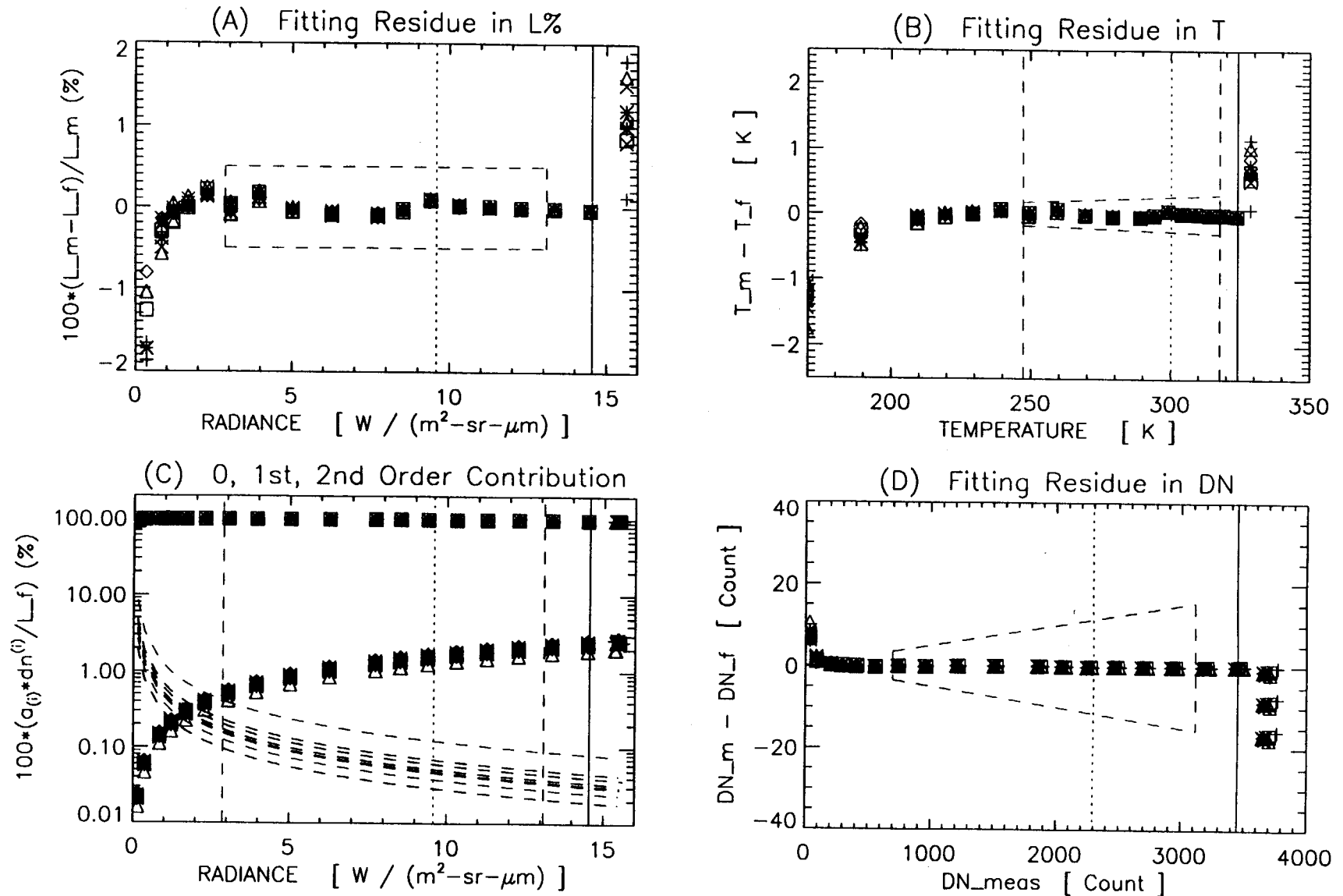


# Band 29 Calibration Fitting Summary



Instrument Temperature	# of BCS levels used	Cold Plateau (256K)	Nominal 1 (273K)	Nominal 2 (273K)	Hot Plateau (283K)
Quadratic Fitting (210 K - 320 K)	15				

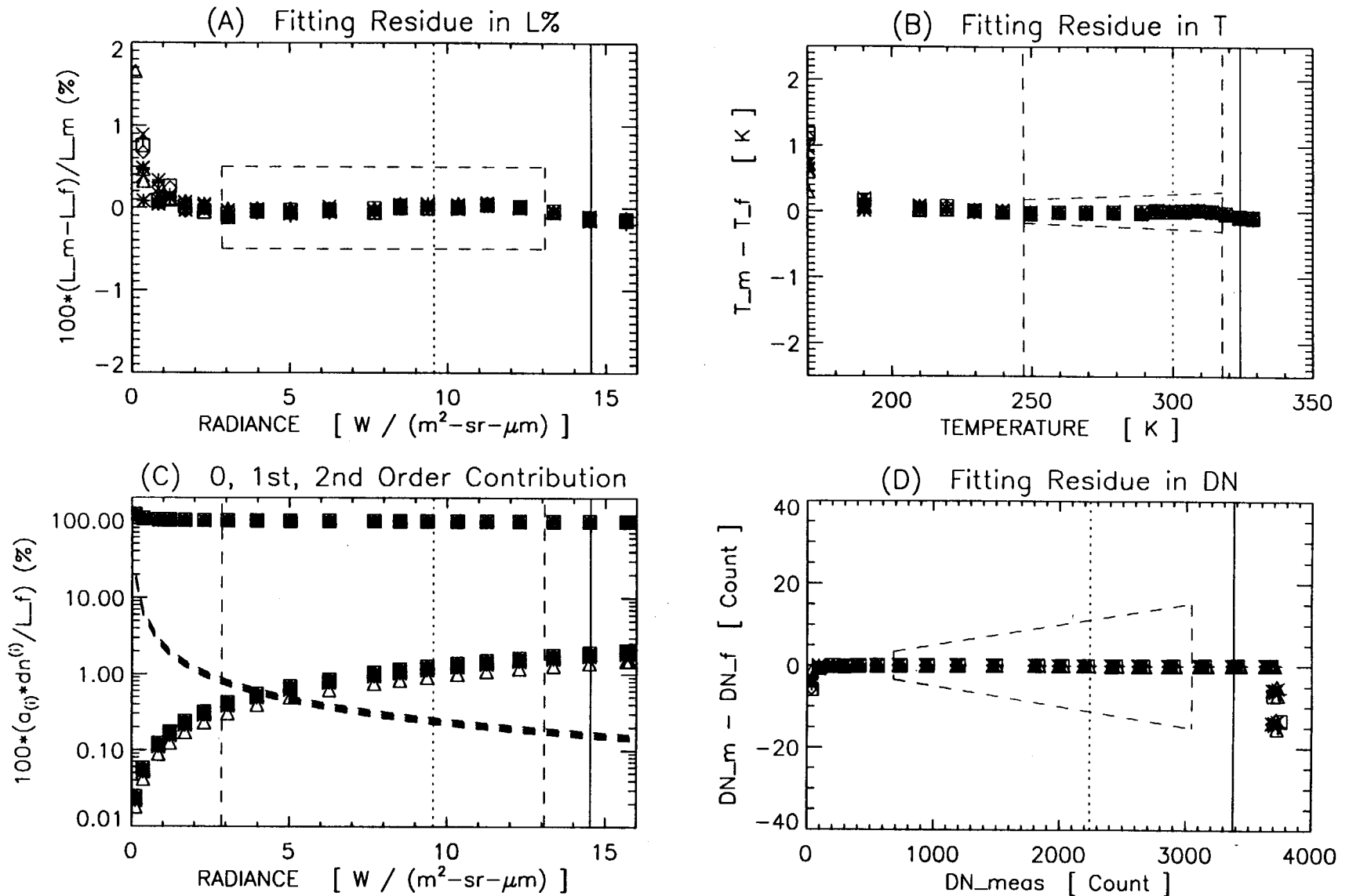
B29 L vs DN Quadratic Fitting; Cold Plateau (256 K); UAID: 1315 - 1337



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 9.58 (Grn Dotted Line); Lmax = 14.5 (Red Solid Line)  
 0.3Ltyp = 2.87; 0.9Lmax = 13.0 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 210 (K) - 318 (K)  
 0.09Ltyp - 0.92Lmax

B29 L vs DN Quadratic Fitting; Nominal Plateau 1 (273 K); UAID: 1506 – 1526

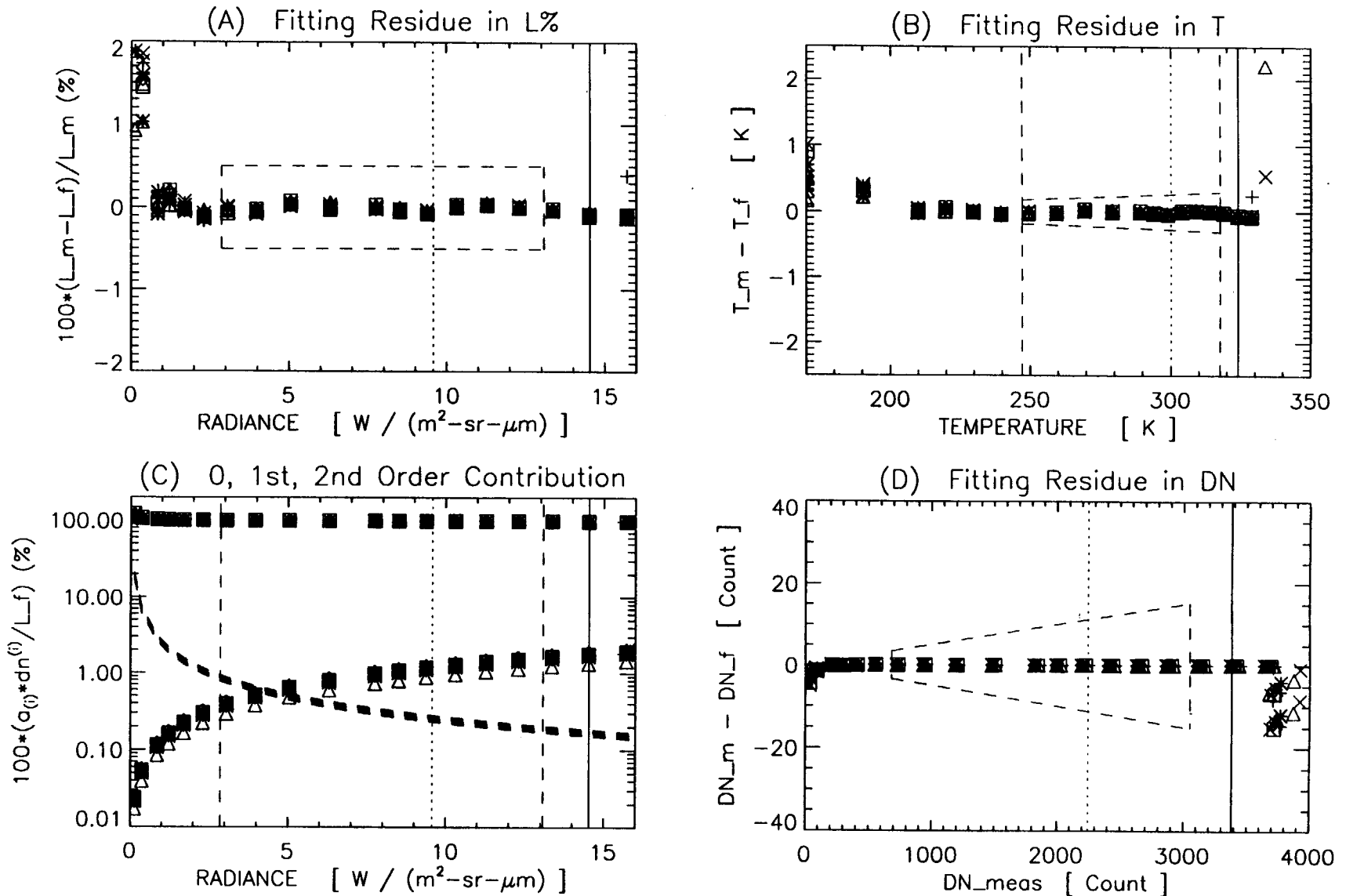


Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 9.58 (Grn Dotted Line); Lmax = 14.5 (Red Solid Line)  
 0.3Ltyp = 2.87; 0.9Lmax = 13.0 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 210 (K) – 318 (K)  
 0.09Ltyp – 0.92Lmax



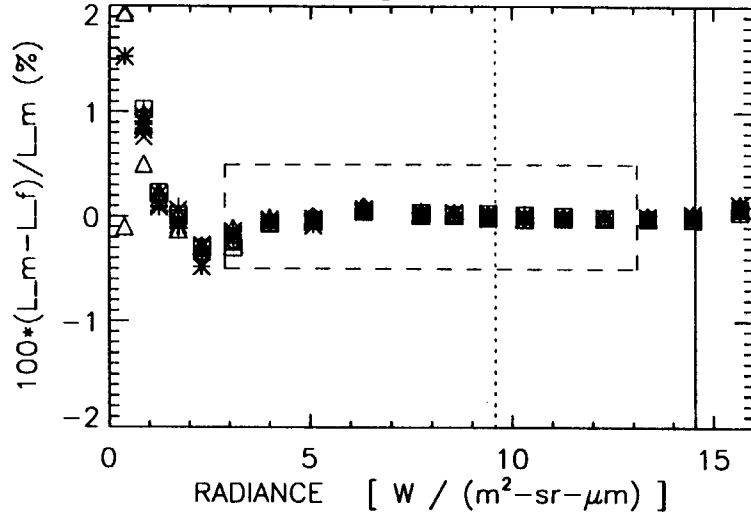
B29 L vs DN Quadratic Fitting; Nominal Plateau 2 (273 K); UAID: 1595 - 1618



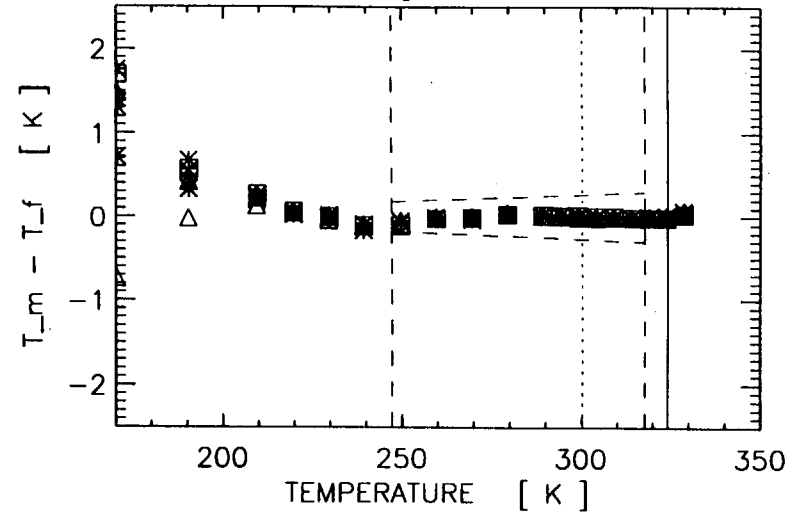
Fitting Range: 210 (K) - 318 (K)  
 0.09Ltyp - 0.92Lmax

B29 L vs DN Quadratic Fitting; Hot Plateau (283 K); UAID: 1402 - 1426

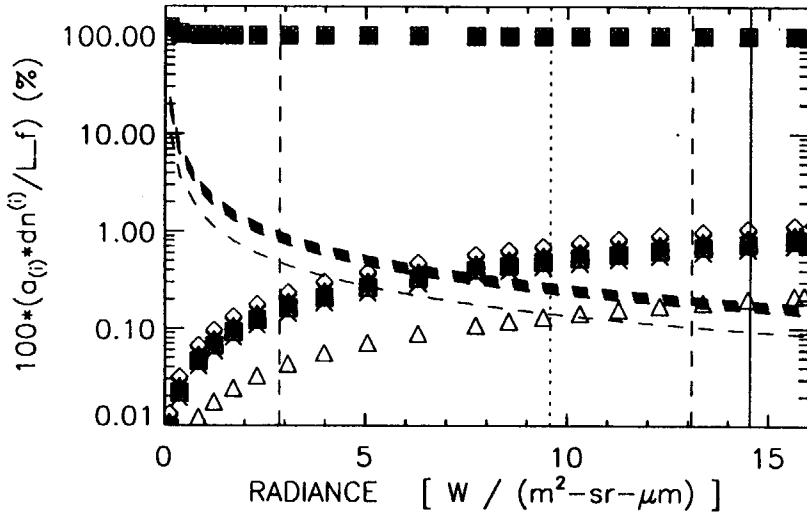
(A) Fitting Residue in L%



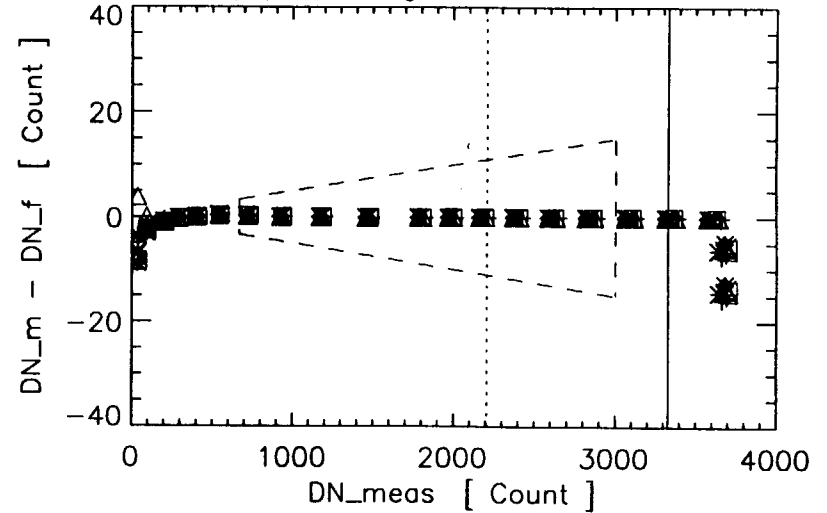
(B) Fitting Residue in T



(C) 0, 1st, 2nd Order Contribution



(D) Fitting Residue in DN



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 9.58 (Grn Dotted Line); Lmax = 14.5 (Red Solid Line)  
 0.3Ltyp = 2.87; 0.9Lmax = 13.0 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 210 (K) - 318 (K)  
 0.09Ltyp - 0.92Lmax

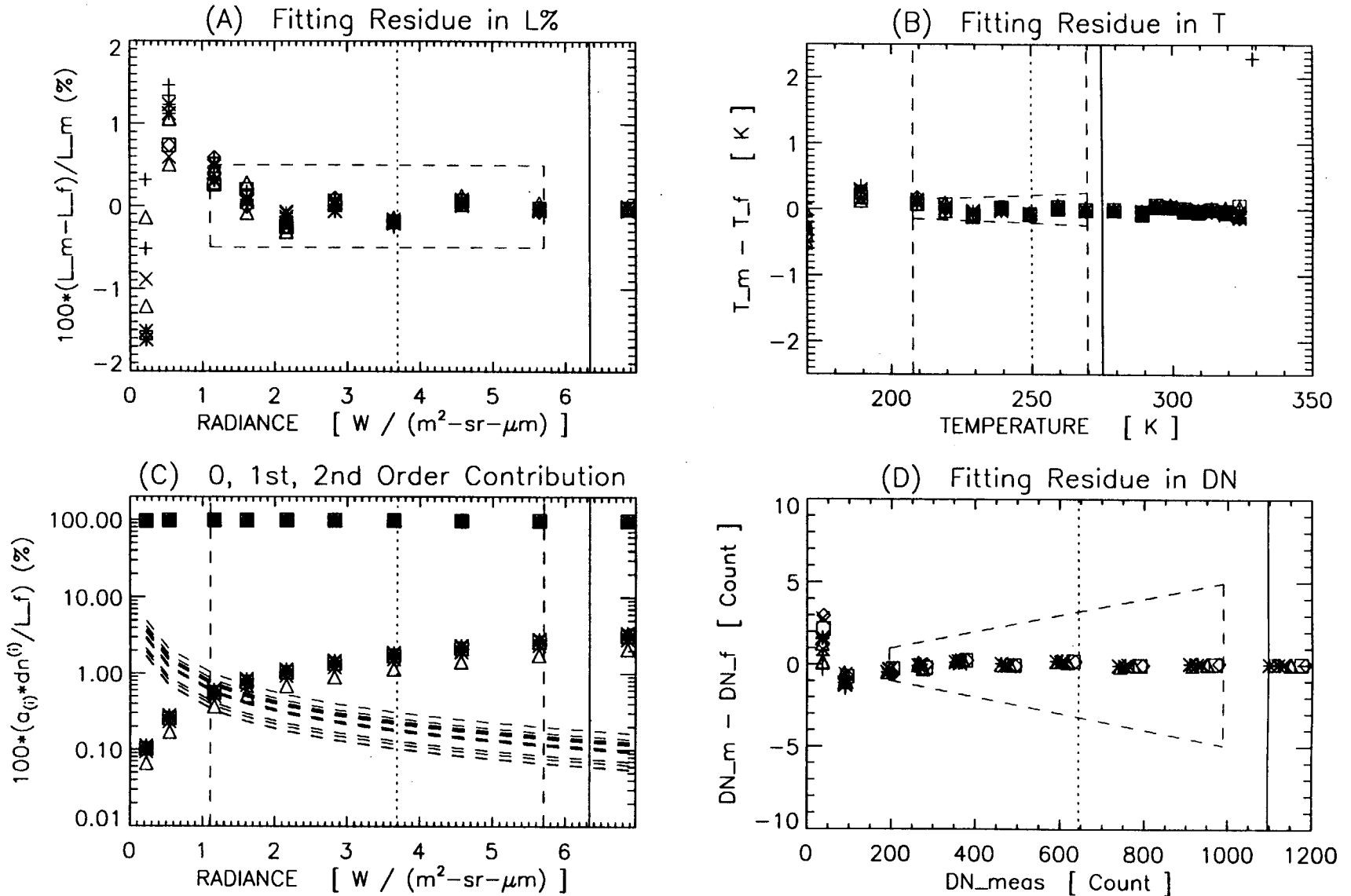


# Band 30 Calibration Fitting Summary



Instrument Temperature	# of BCS levels used	Cold Plateau (256K)	Nominal 1 (273K)	Nominal 2 (273K)	Hot Plateau (283K)
Quadratic Fitting (210 K - 315 K)	14				

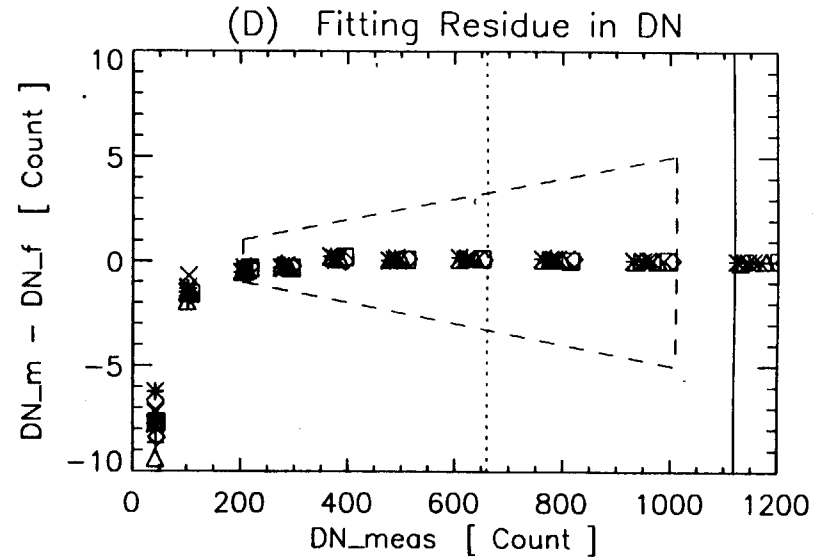
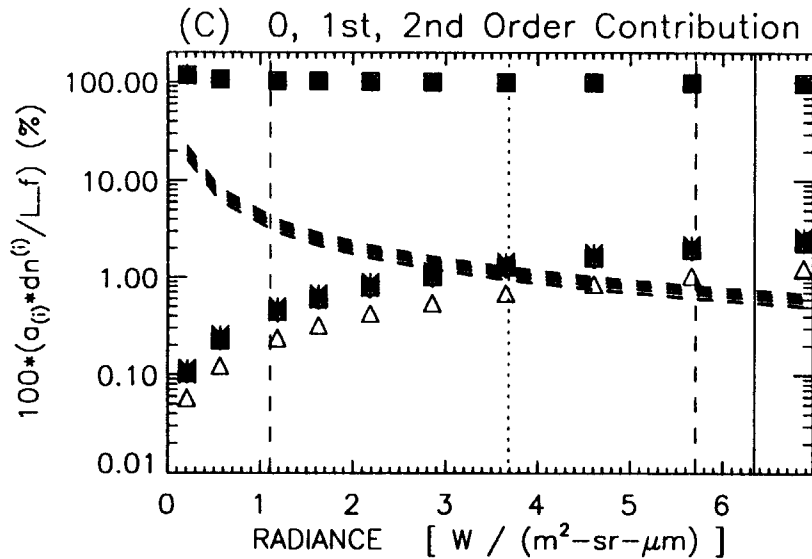
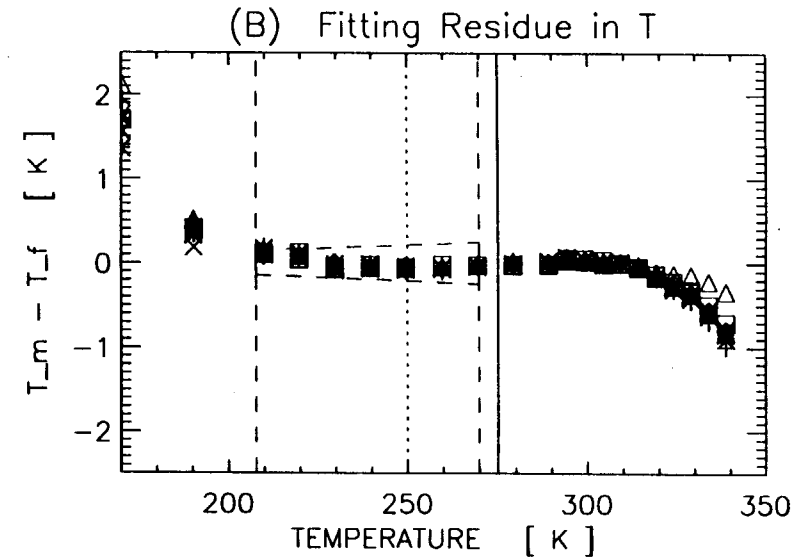
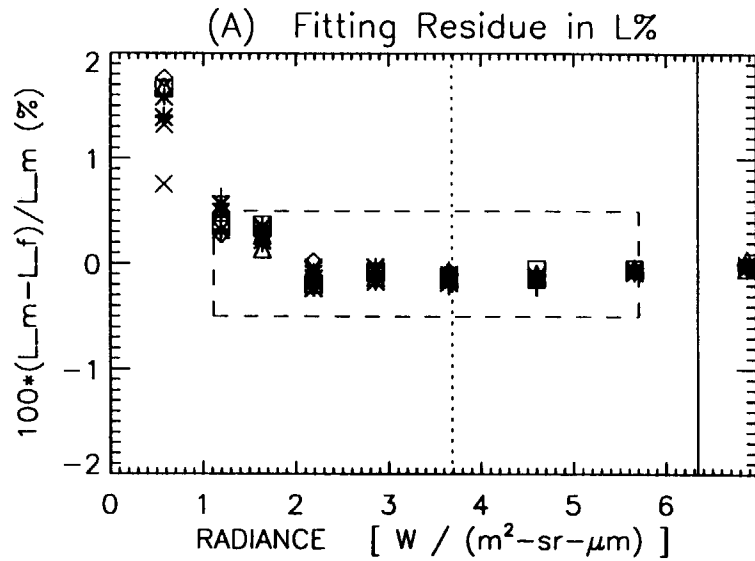
B30 L vs DN Quadratic Fitting; Cold Plateau (256 K); UAID: 1315 - 1337



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 3.69 (Grn Dotted Line); Lmax = 6.34 (Red Solid Line)  
 0.3Ltyp = 1.11; 0.9Lmax = 5.71 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 210 (K) - 315 (K)  
 0.32Ltyp - 1.96Lmax

B30 L vs DN Quadratic Fitting; Nominal Plateau 1 (273 K); UAID: 1506 – 1526

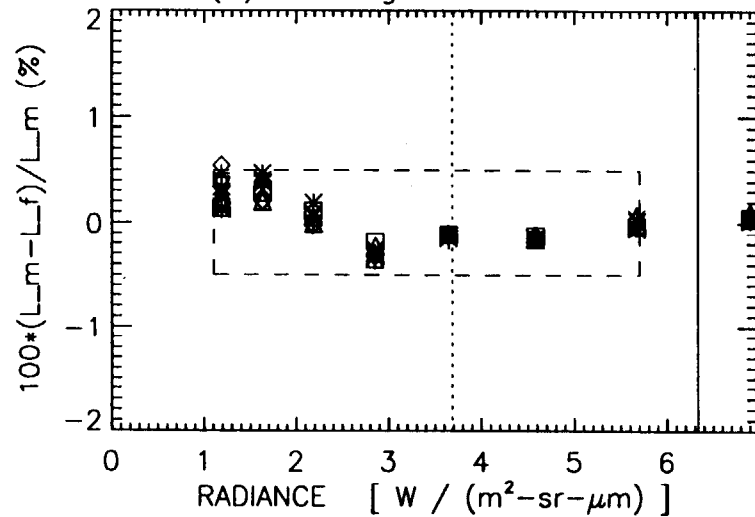


Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 3.69 (Grn Dotted Line); Lmax = 6.34 (Red Solid Line)  
 0.3Ltyp = 1.11; 0.9Lmax = 5.71 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

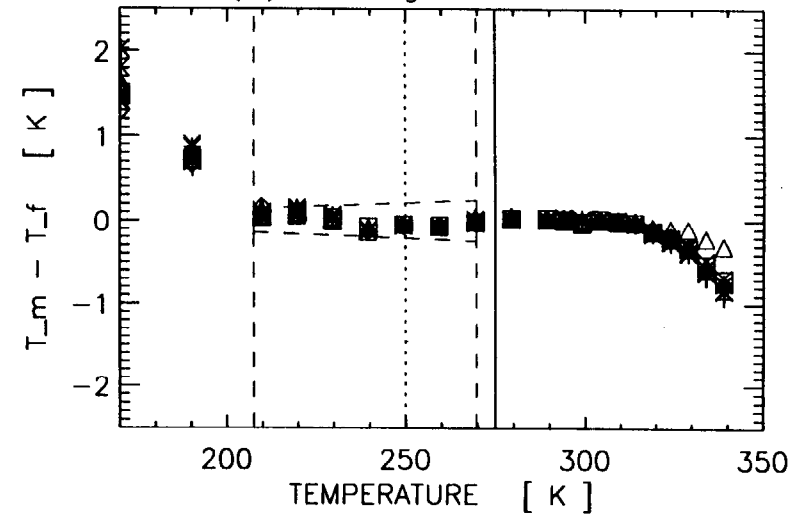
Fitting Range: 210 (K) – 315 (K)  
 0.32Ltyp – 1.96Lmax

B30 L vs DN Quadratic Fitting; Nominal Plateau 2 (273 K); UAID: 1595 - 1618

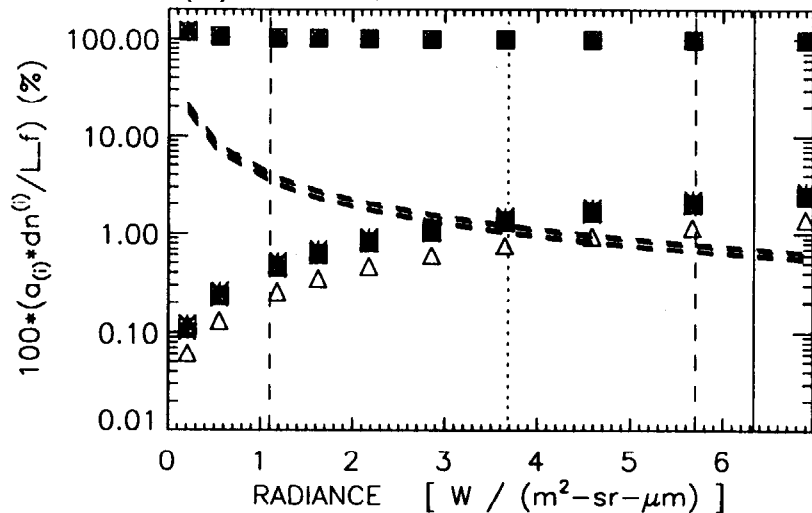
(A) Fitting Residue in L%



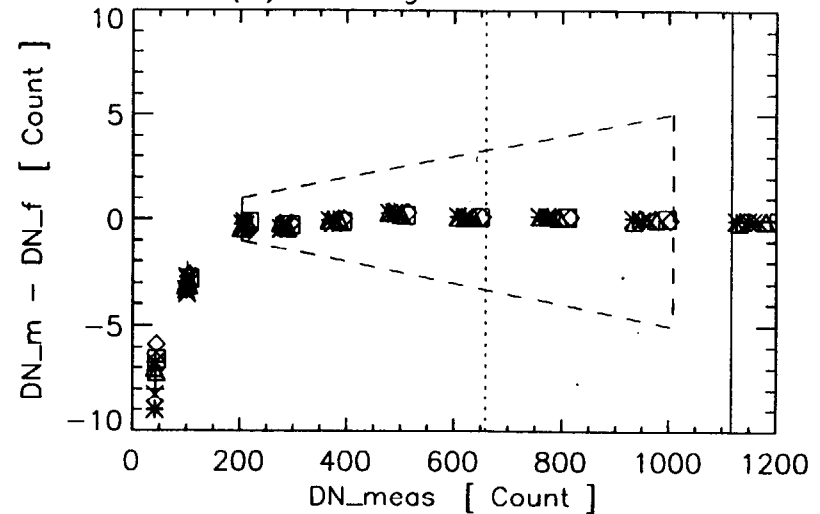
(B) Fitting Residue in T



(C) 0, 1st, 2nd Order Contribution



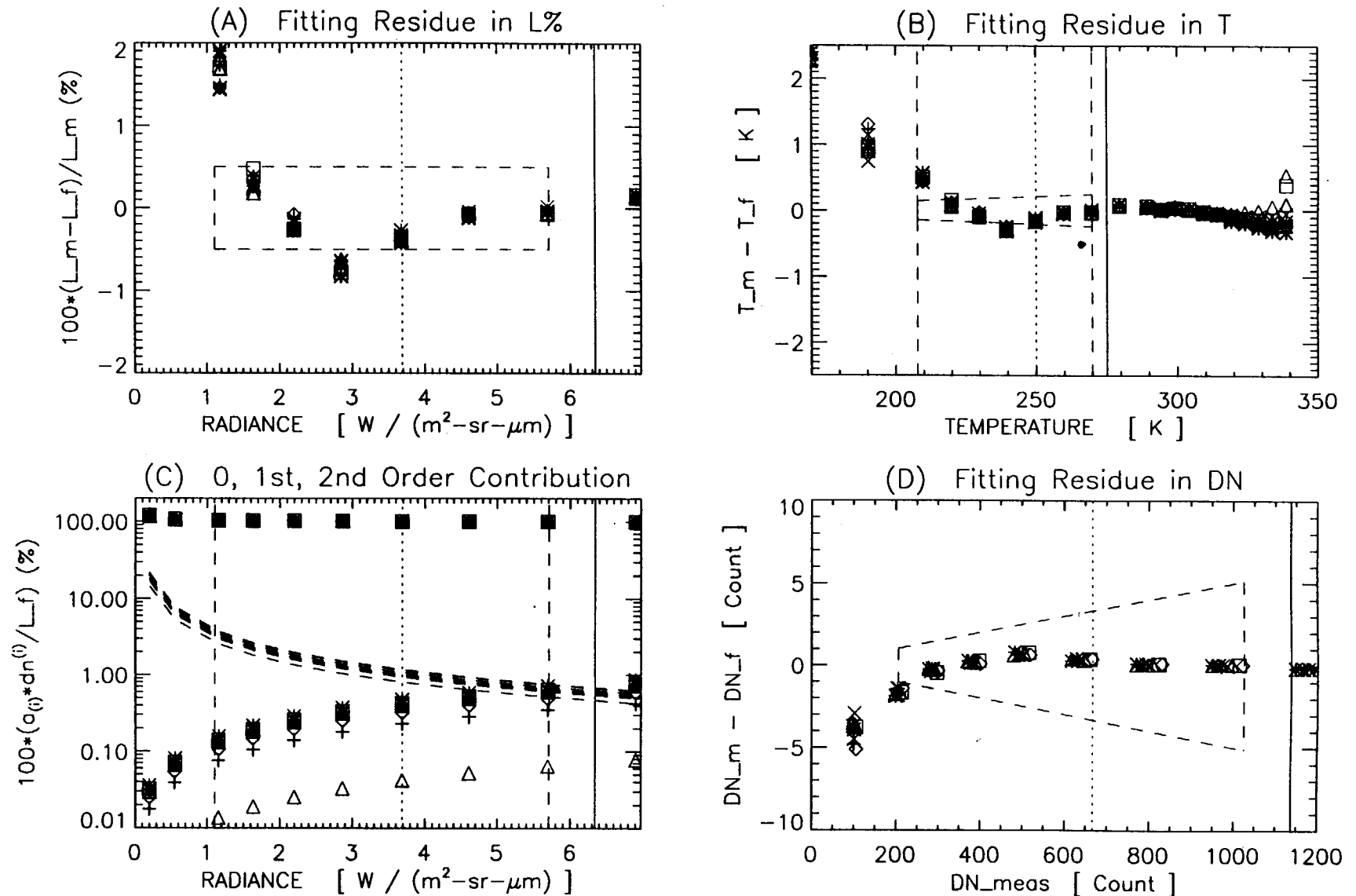
(D) Fitting Residue in DN



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 3.69 (Grn Dotted Line); Lmax = 6.34 (Red Solid Line)  
 0.3Ltyp = 1.11; 0.9Lmax = 5.71 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 210 (K) - 315 (K)  
 0.32Ltyp - 1.96Lmax

B30 L vs DN Quadratic Fitting; Hot Plateau (283 K); UAID: 1402 - 1426



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 3.69 (Grn Dotted Line); Lmax = 6.34 (Red Solid Line)  
 0.3Ltyp = 1.11; 0.9Lmax = 5.71 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 210 (K) - 315 (K)  
 0.32Ltyp - 1.96Lmax



# Band 31 Calibration Fitting Summary

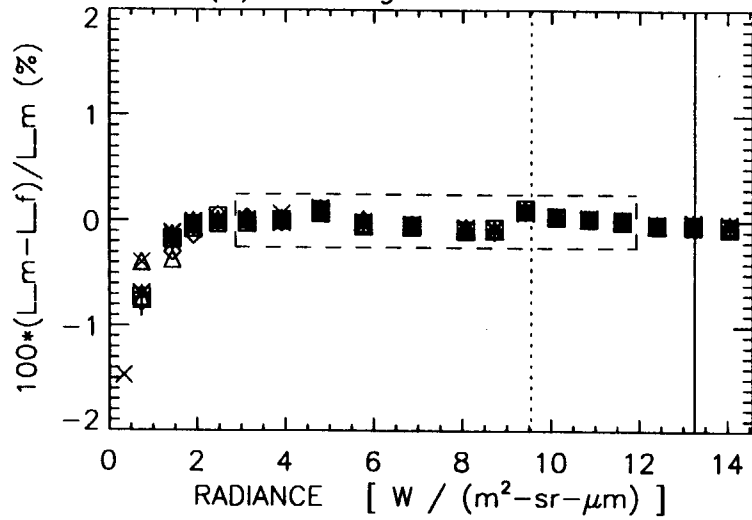


Instrument Temperature	# of BCS levels used	Cold Plateau (256K)	Nominal 1 (273K)	Nominal 2 (273K)	Hot Plateau (283K)
Quadratic Fitting (220 K - 320 K)	14				

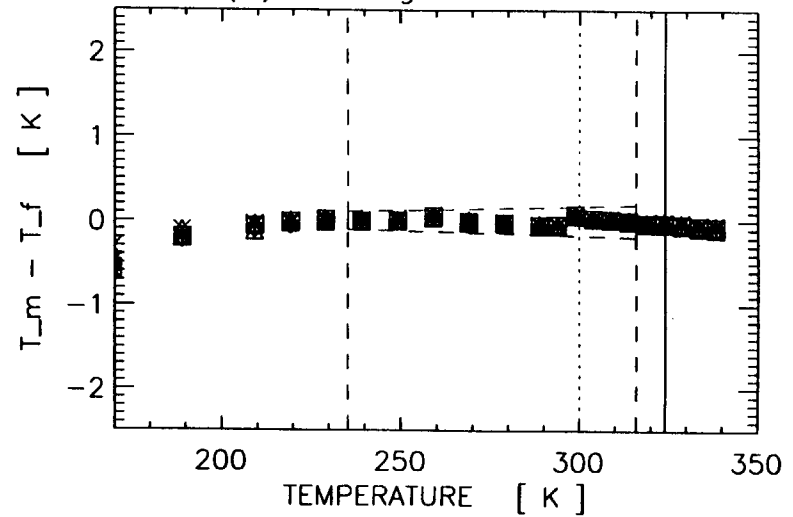


B31 L vs DN Quadratic Fitting; Cold Plateau (256 K); UAID: 1315 - 1337

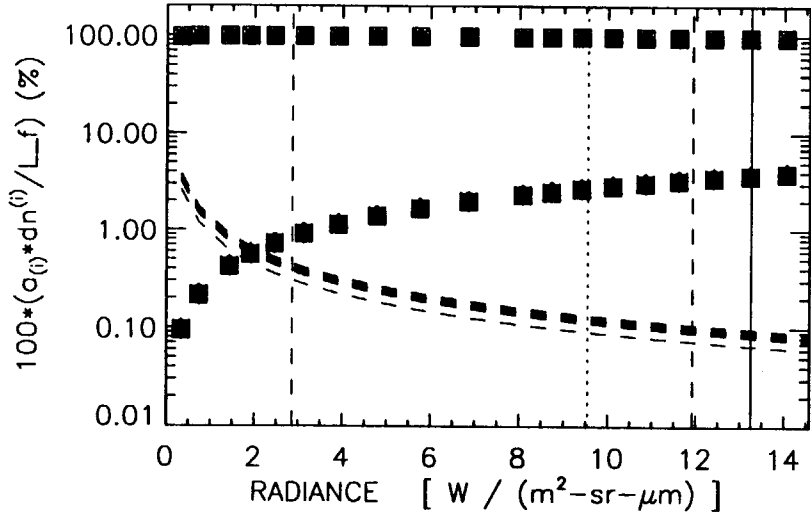
(A) Fitting Residue in L%



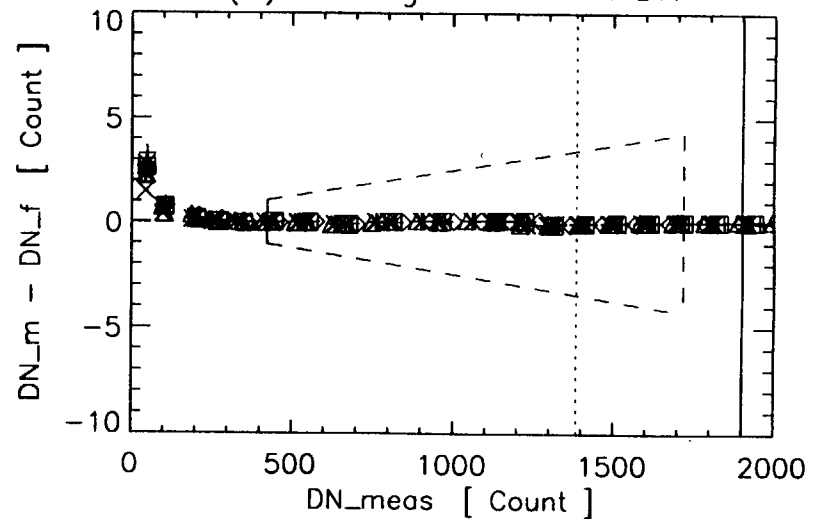
(B) Fitting Residue in T



(C) 0, 1st, 2nd Order Contribution



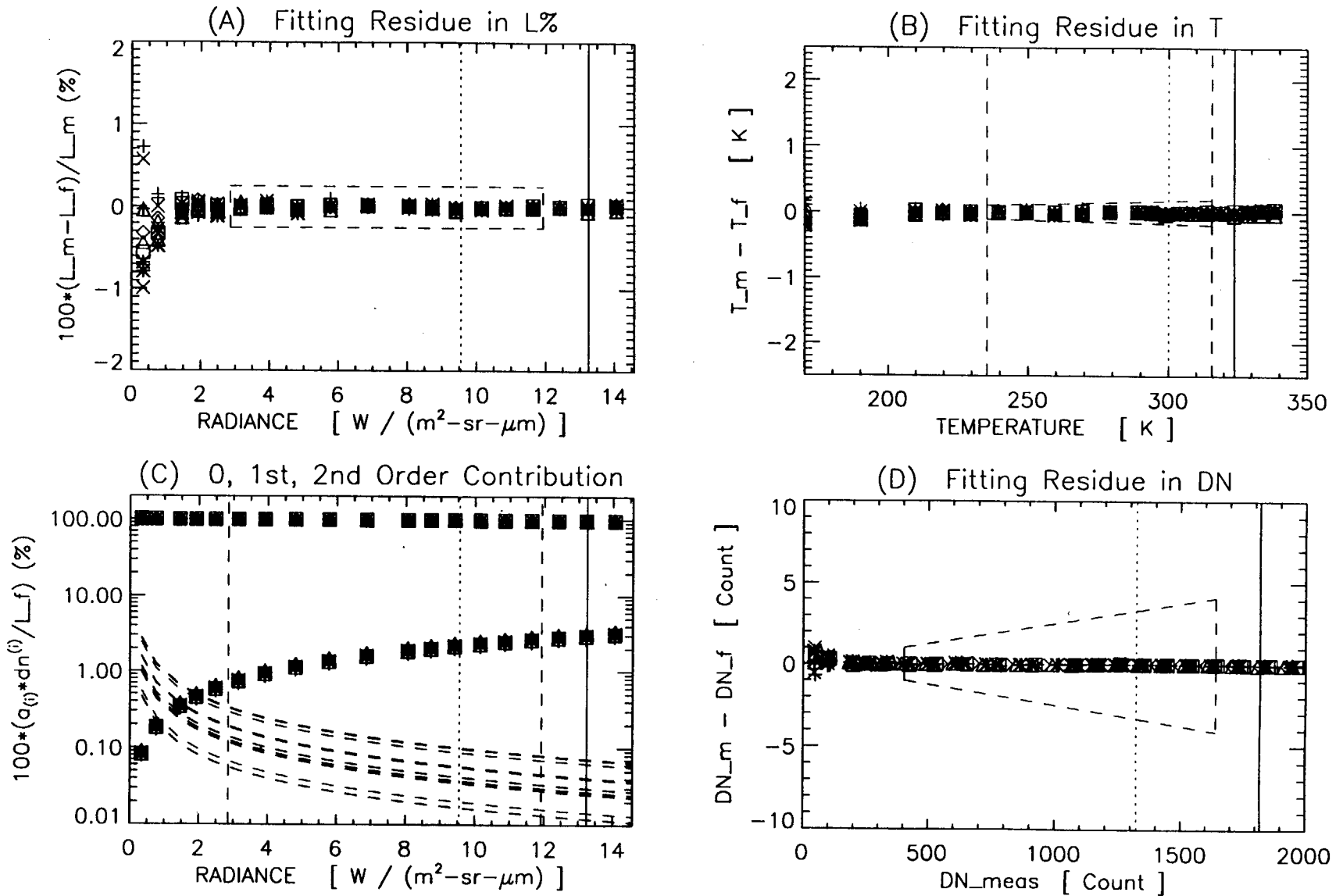
(D) Fitting Residue in DN



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 9.55 (Grn Dotted Line); Lmax = 13.2 (Red Solid Line)  
 0.3Ltyp = 2.87; 0.9Lmax = 11.9 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

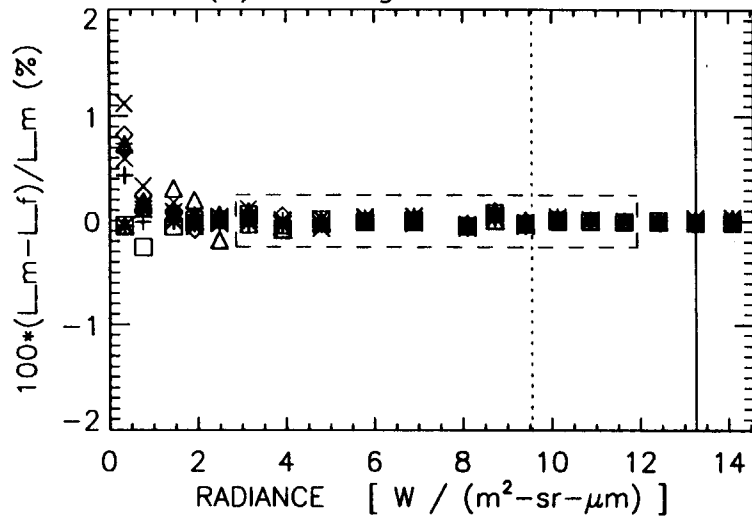
Fitting Range: 220 (K) - 316 (K)  
 0.20Ltyp - 0.94Lmax

B31 L vs DN Quadratic Fitting; Nominal Plateau 1 (273 K); UAID: 1506 – 1526

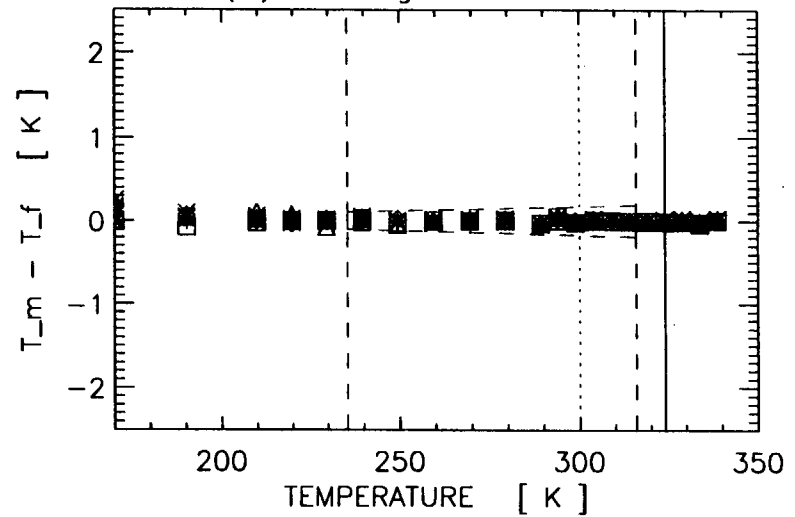


B31 L vs DN Quadratic Fitting; Nominal Plateau 2 (273 K); UAID: 1595 - 1618

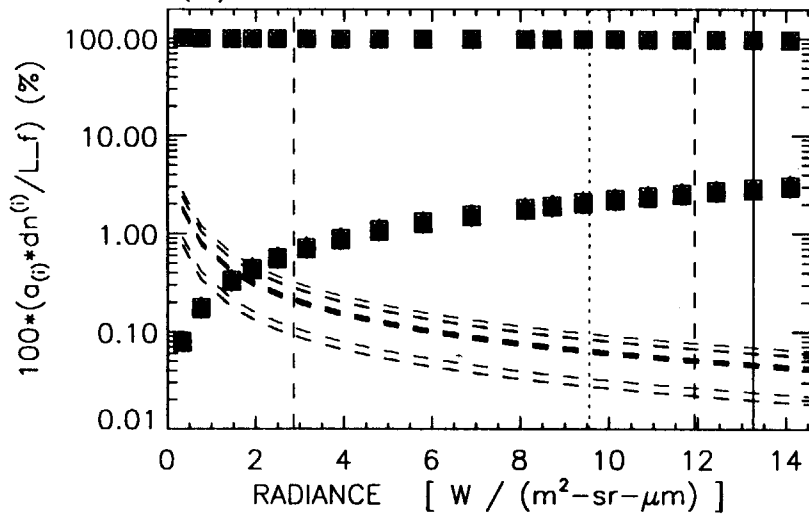
(A) Fitting Residue in L%



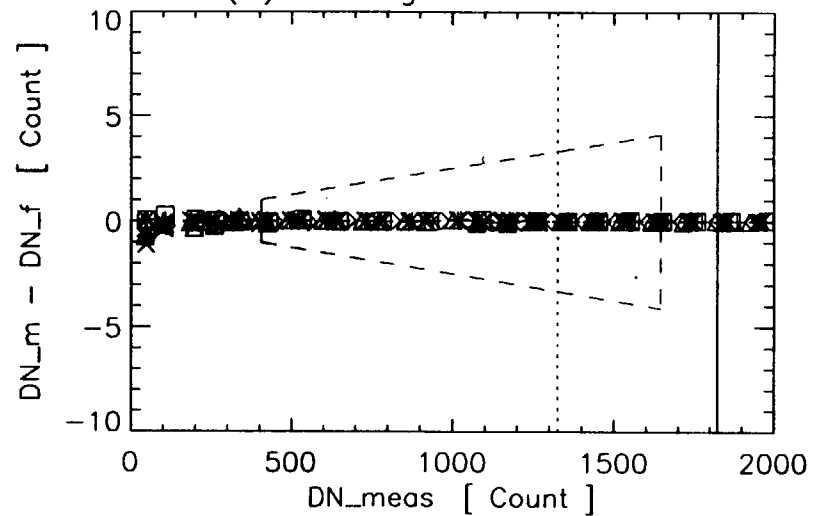
(B) Fitting Residue in T



(C) 0, 1st, 2nd Order Contribution



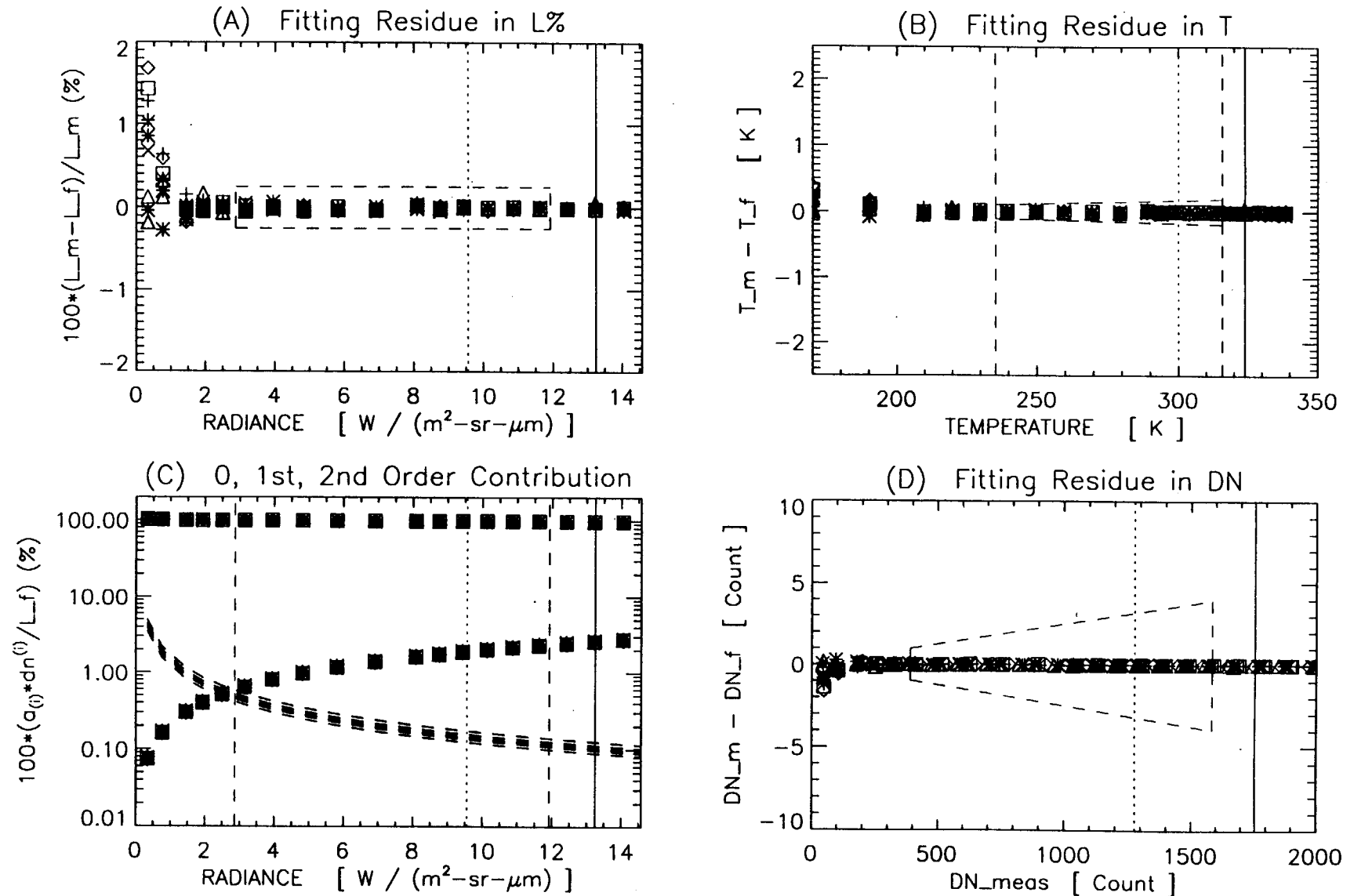
(D) Fitting Residue in DN



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 9.55 (Grn Dotted Line); Lmax = 13.2 (Red Solid Line)  
 0.3Ltyp = 2.87; 0.9Lmax = 11.9 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 220 (K) - 316 (K)  
 0.20Ltyp - 0.94Lmax

B31 L vs DN Quadratic Fitting; Hot Plateau (283 K); UAID: 1402 – 1426



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 9.55 (Grn Dotted Line); Lmax = 13.2 (Red Solid Line)  
 0.3Ltyp = 2.87; 0.9Lmax = 11.9 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 220 (K) – 316 (K)  
 0.20Ltyp - 0.94Lmax

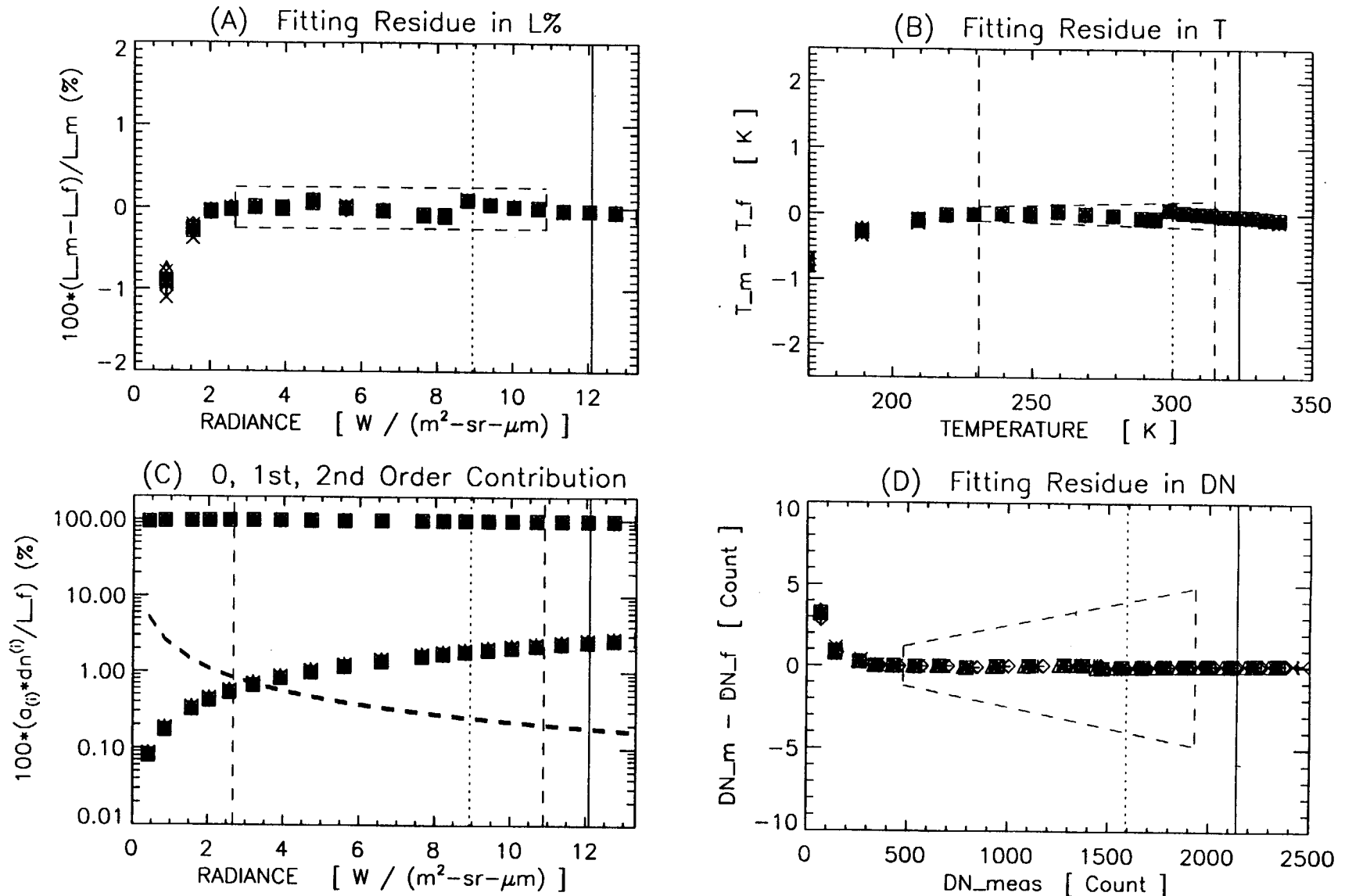


# Band 32 Calibration Fitting Summary



Instrument Temperature	# of BCS levels used	Cold Plateau (256K)	Nominal 1 (273K)	Nominal 2 (273K)	Hot Plateau (283K)
Quadratic Fitting (220 K - 320 K)	14				

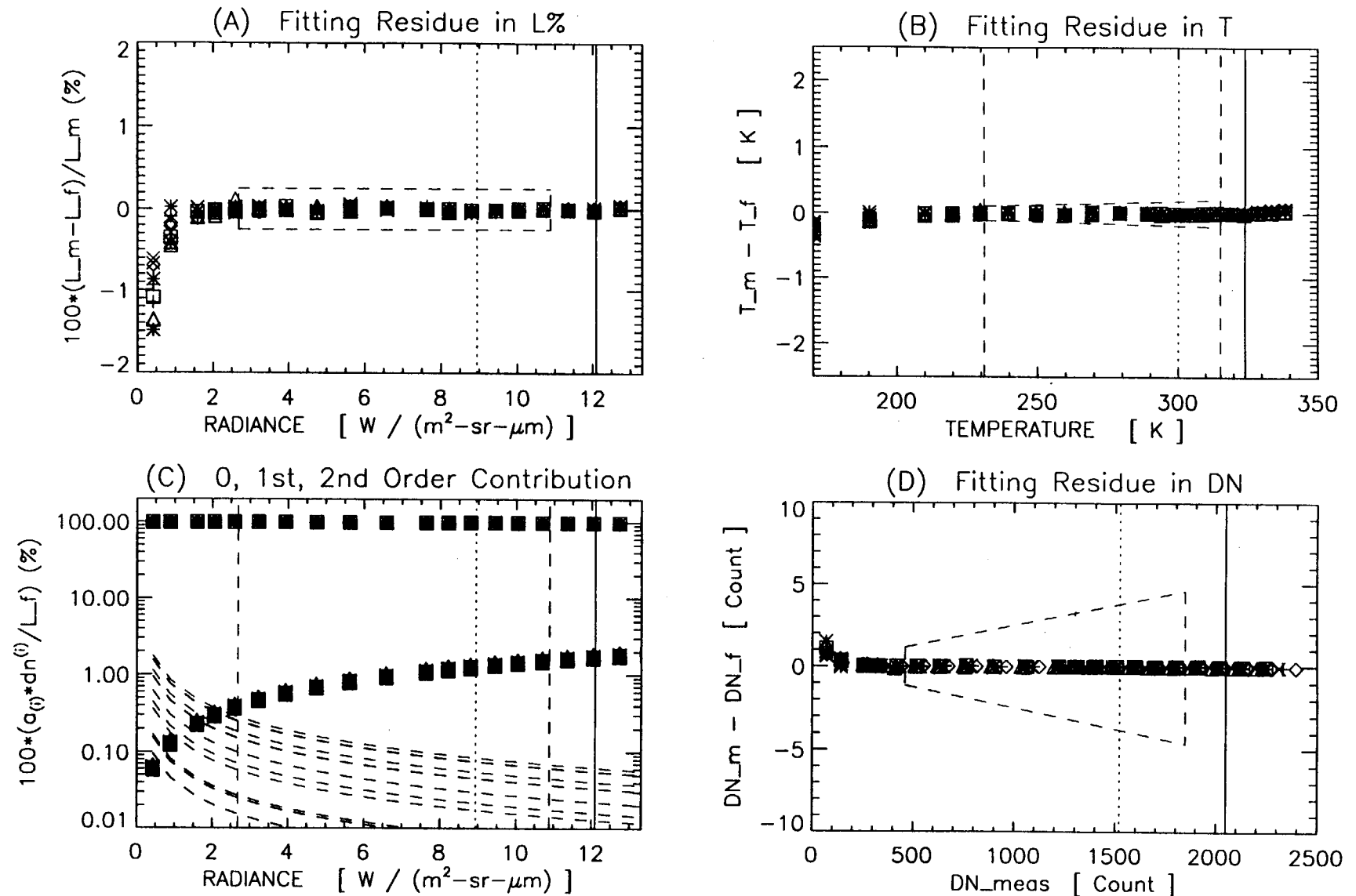
B32 L vs DN Quadratic Fitting; Cold Plateau (256 K); UAID: 1315 - 1337



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 8.94 (Grn Dotted Line); Lmax = 12.1 (Red Solid Line)  
 0.3Ltyp = 2.68; 0.9Lmax = 10.8 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 220 (K) - 315 (K)  
 0.23Ltyp - 0.94Lmax

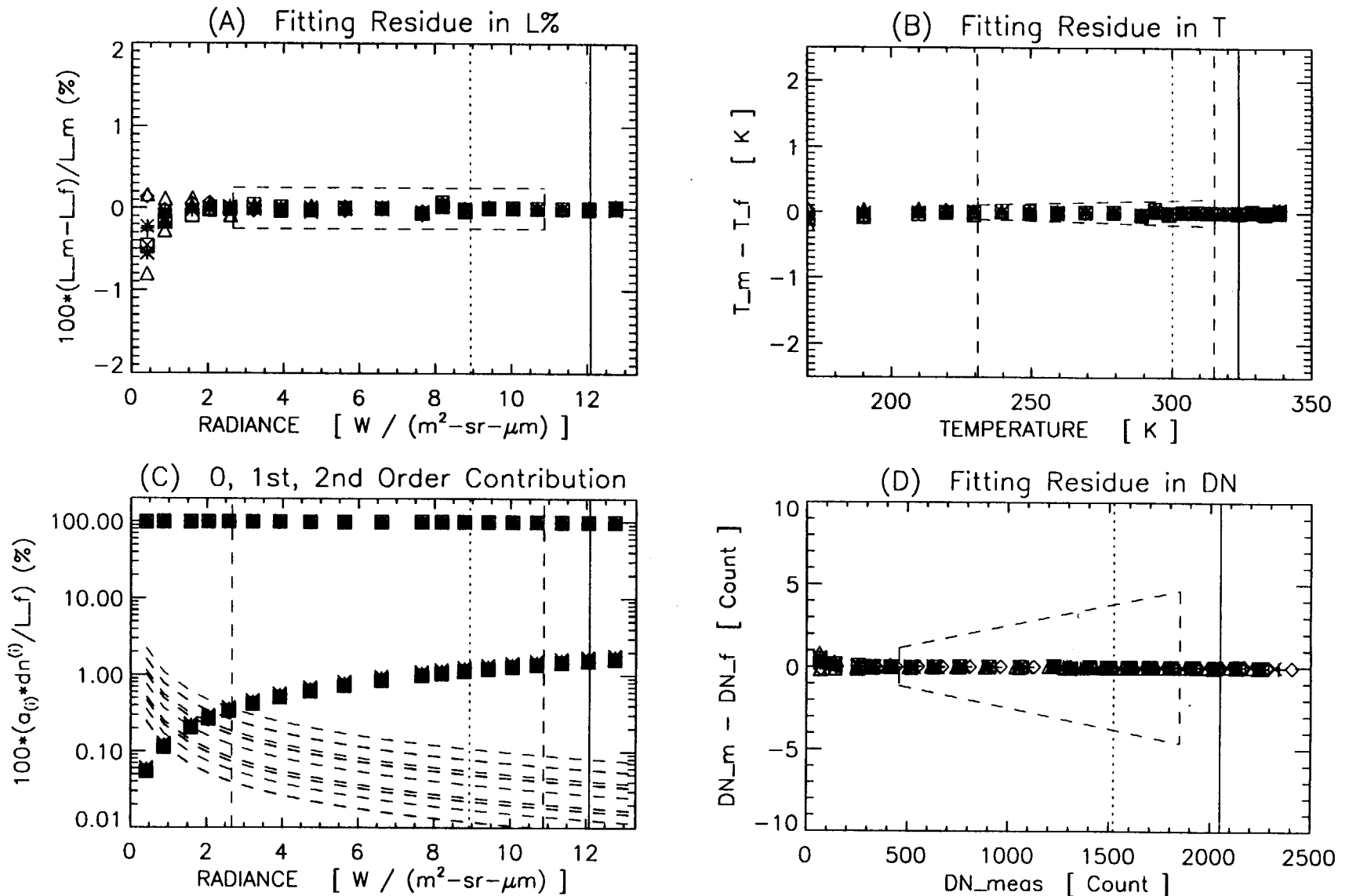
B32 L vs DN Quadratic Fitting; Nominal Plateau 1 (273 K); UAID: 1506 – 1526



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 8.94 (Grn Dotted Line); Lmax = 12.1 (Red Solid Line)  
 0.3Ltyp = 2.68; 0.9Lmax = 10.8 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp – 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 220 (K) – 315 (K)  
 0.23Ltyp – 0.94Lmax

B32 L vs DN Quadratic Fitting; Nominal Plateau 2 (273 K); UAID: 1595 - 1618



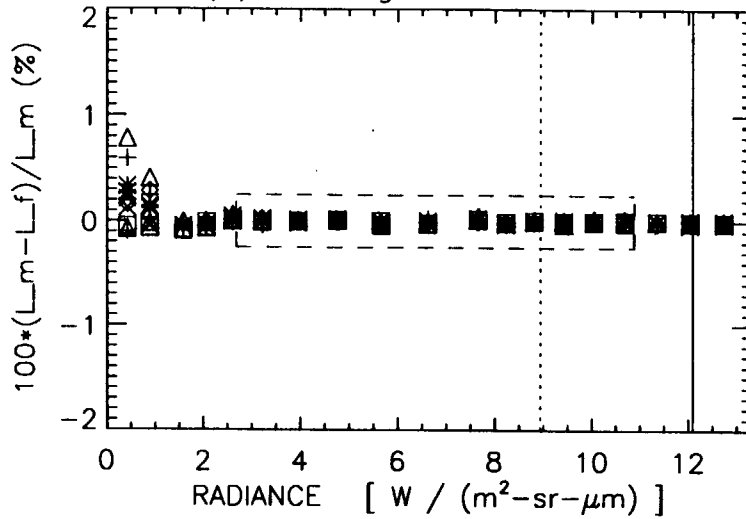
Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 8.94 (Grn Dotted Line); Lmax = 12.1 (Red Solid Line)  
 0.3Ltyp = 2.68; 0.9Lmax = 10.8 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 220 (K) - 315 (K)  
 0.23Ltyp - 0.94Lmax

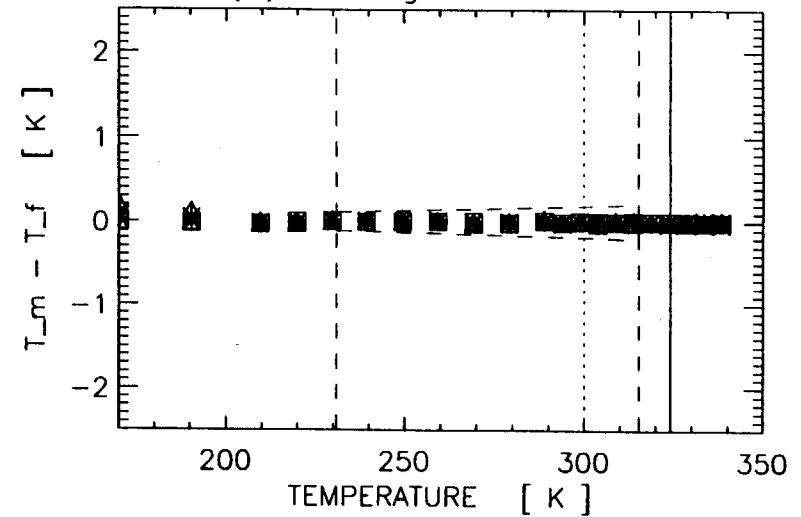


B32 L vs DN Quadratic Fitting; Hot Plateau (283 K); UAID: 1402 - 1426

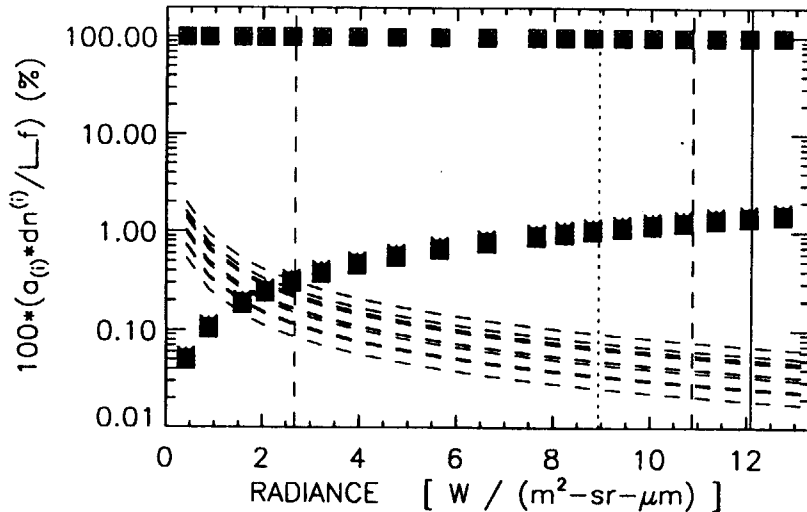
(A) Fitting Residue in L%



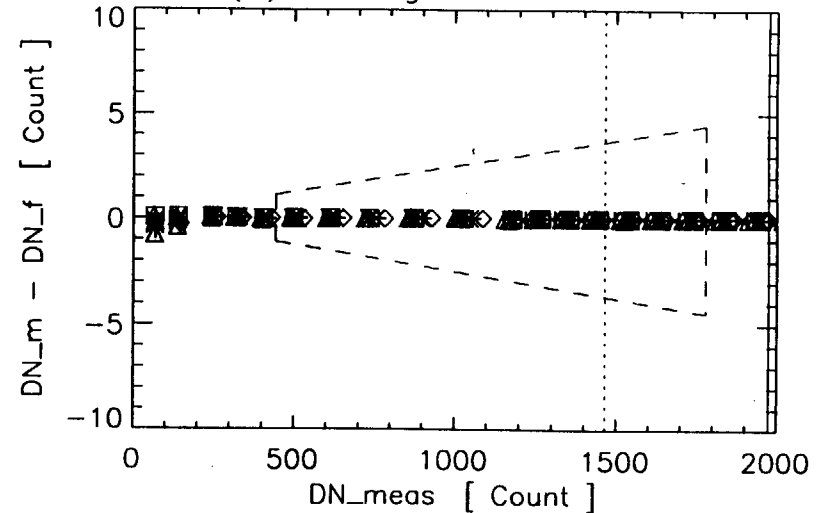
(B) Fitting Residue in T



(C) 0, 1st, 2nd Order Contribution



(D) Fitting Residue in DN



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 8.94 (Grn Dotted Line); Lmax = 12.1 (Red Solid Line)  
 0.3Ltyp = 2.68; 0.9Lmax = 10.8 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 220 (K) - 315 (K)  
 0.23Ltyp - 0.94Lmax

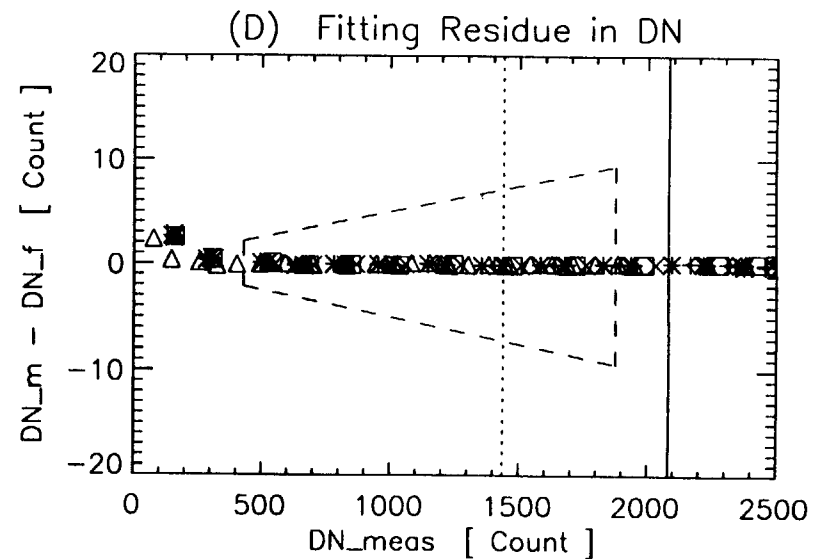
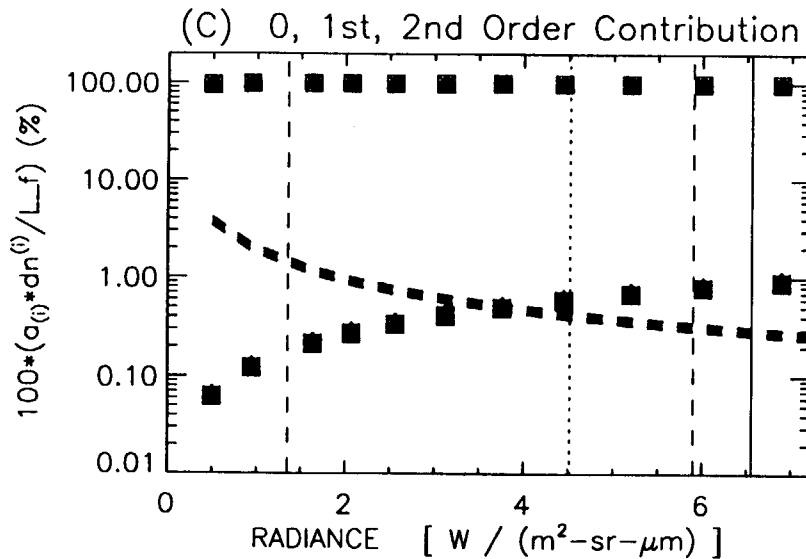
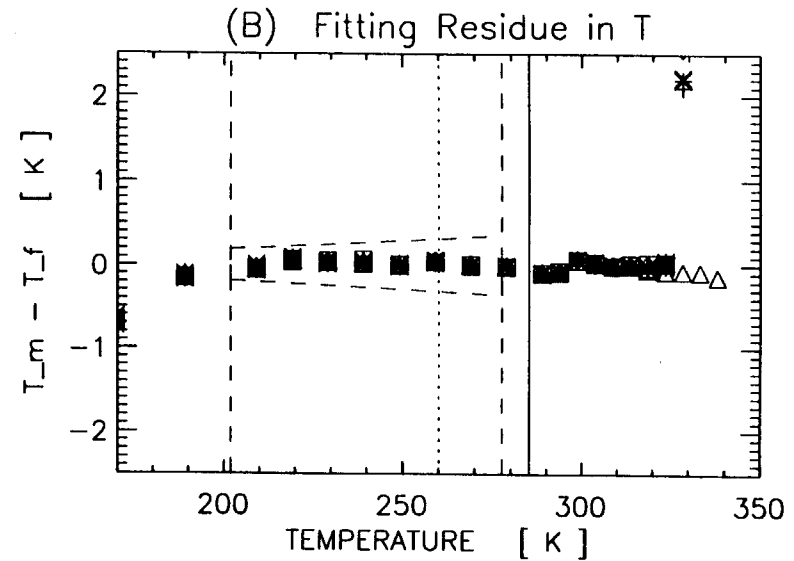
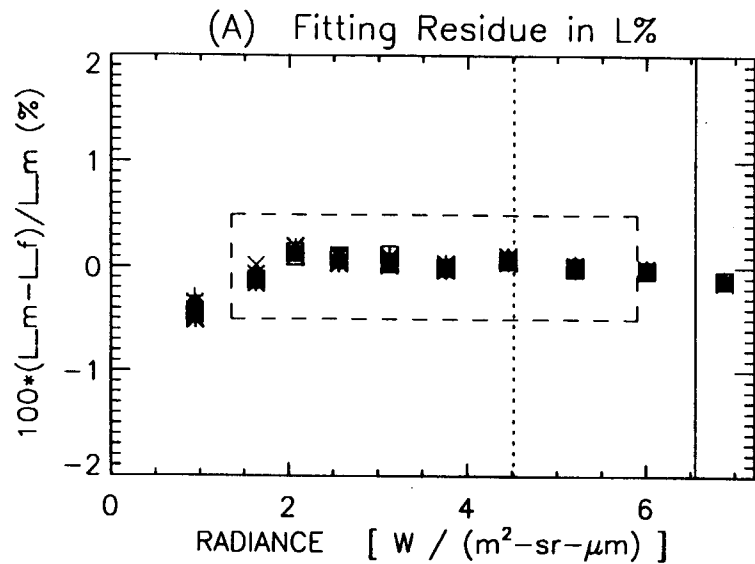


# Band 33 Calibration Fitting Summary



Instrument Temperature	# of BCS levels used	Cold Plateau (256K)	Nominal 1 (273K)	Nominal 2 (273K)	Hot Plateau (283K)
Quadratic Fitting (190 K - 315 K)	15				

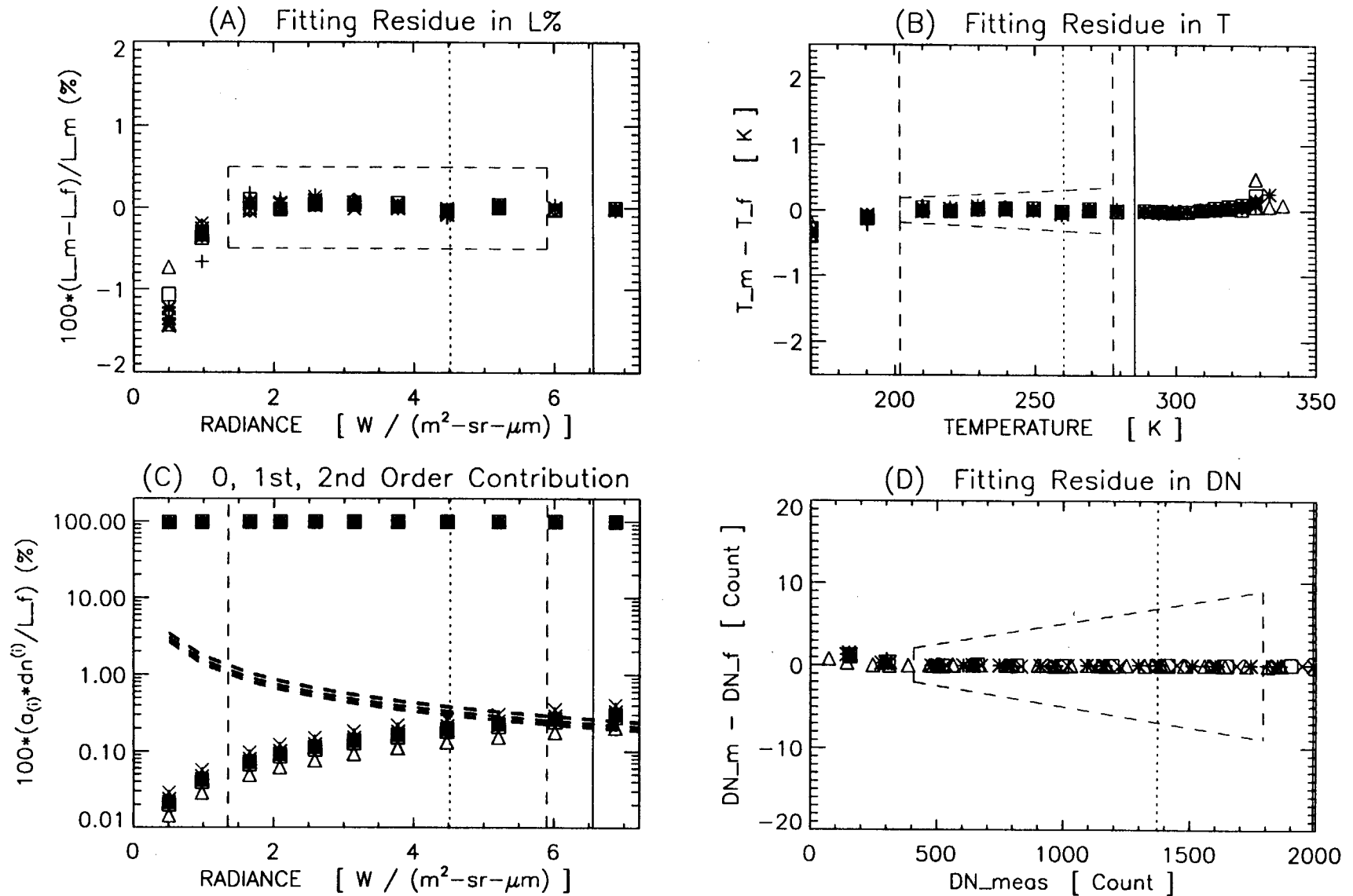
B33 L vs DN Quadratic Fitting; Cold Plateau (256 K); UAID: 1315 - 1337



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 4.52 (Grn Dotted Line); Lmax = 5.56 (Red Solid Line)  
 0.3Ltyp = 1.36; 0.9Lmax = 5.90 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 190 (K) - 315 (K)  
 0.21Ltyp - 1.42Lmax

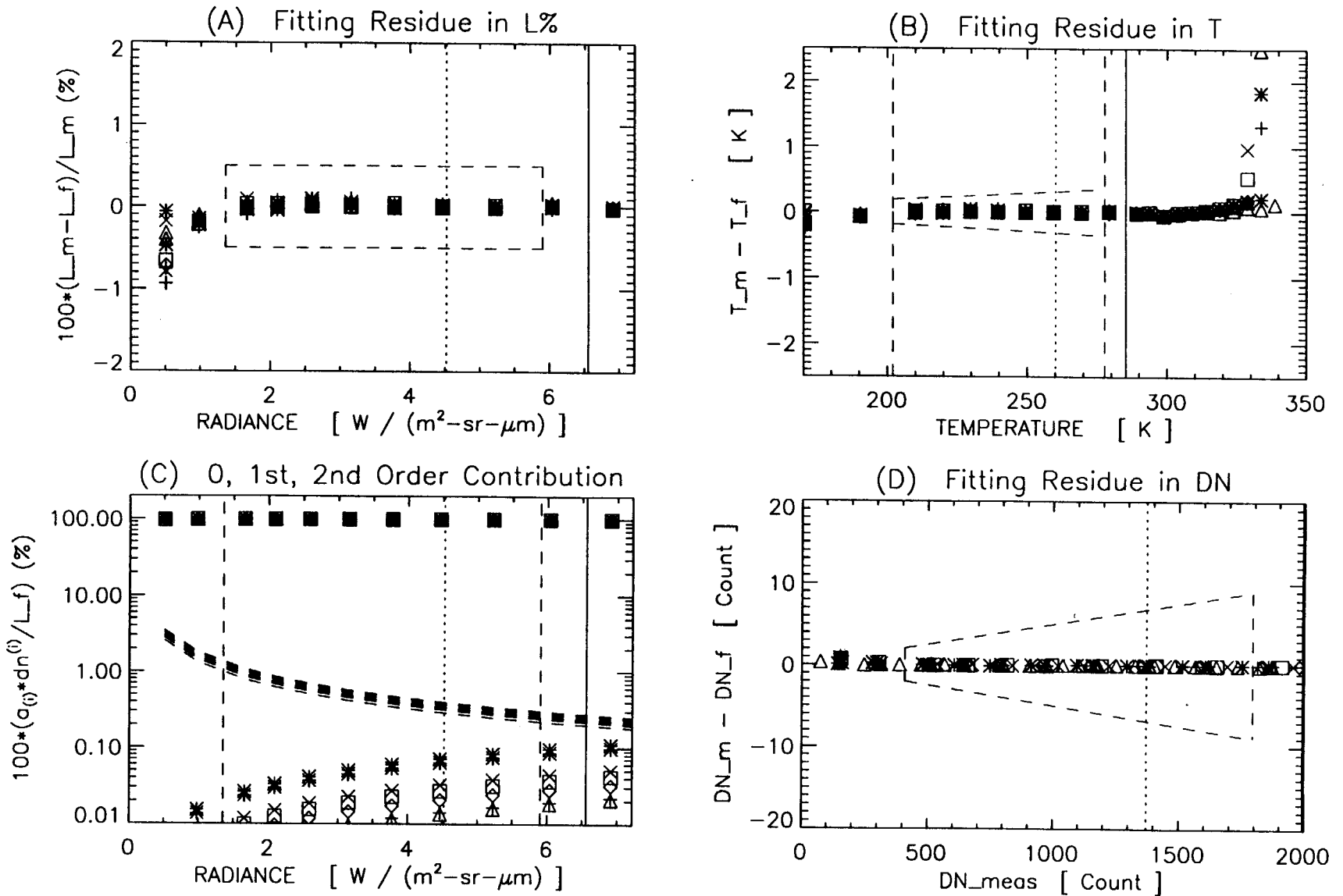
B33 L vs DN Quadratic Fitting; Nominal Plateau 1 (273 K); UAID: 1506 – 1526



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 4.52 (Grn Dotted Line); Lmax = 6.56 (Red Solid Line)  
 0.3Ltyp = 1.36; 0.9Lmax = 5.90 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 190 (K) - 315 (K)  
 0.22Ltyp - 1.42Lmax

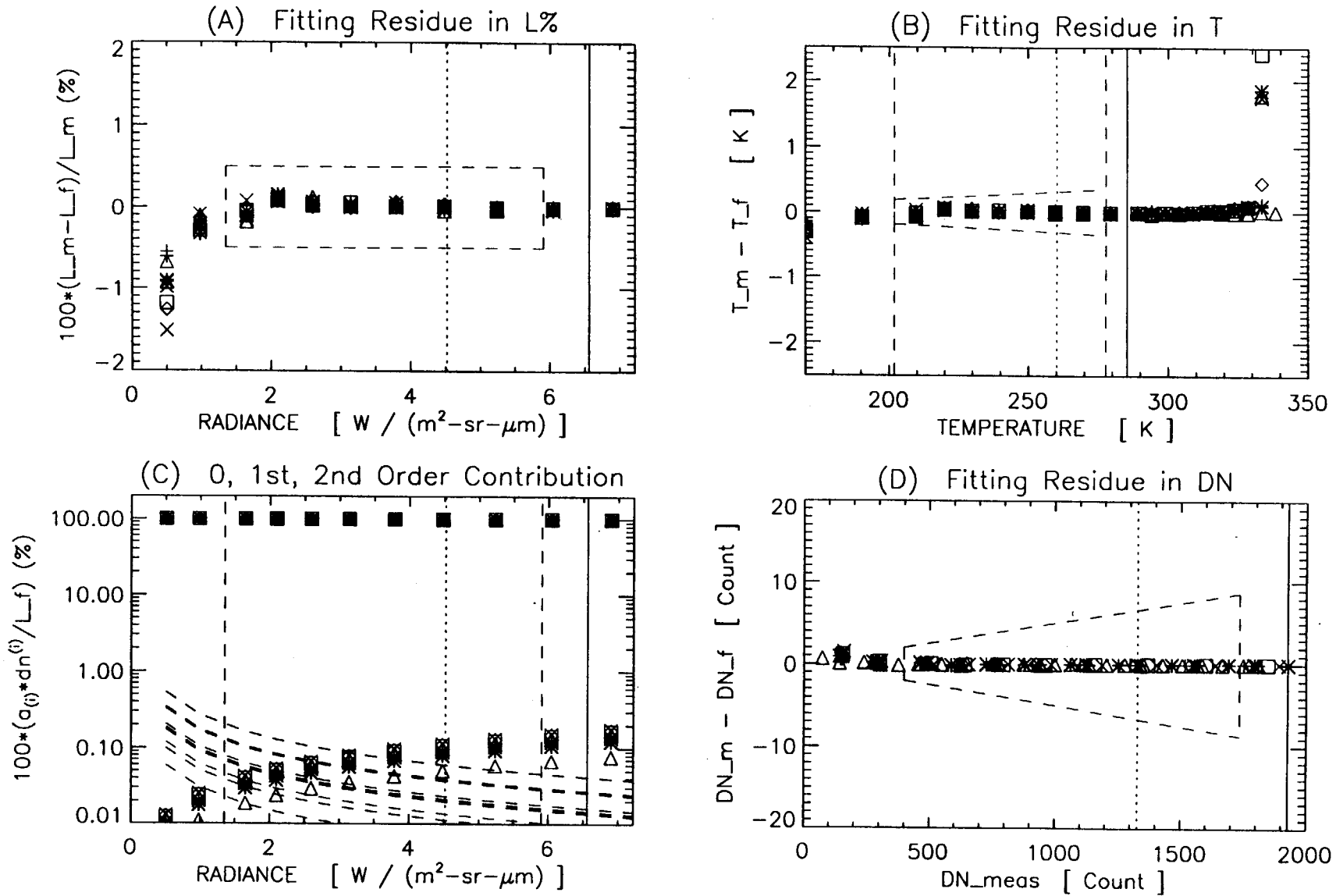
B33 L vs DN Quadratic Fitting; Nominal Plateau 2 (273 K); UAID: 1595 - 1618



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 4.52 (Grn Dotted Line); Lmax = 6.56 (Red Solid Line)  
 0.3Ltyp = 1.36; 0.9Lmax = 5.90 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 190 (K) - 315 (K)  
 0.22Ltyp - 1.42Lmax

B33 L vs DN Quadratic Fitting; Hot Plateau (283 K); UAID: 1402 - 1426



Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ    Ch5: Red ◇  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*    Ch10: Red Δ  
 Ltyp = 4.52 (Grn Dotted Line);    Lmax = 6.56 (Red Solid Line)  
 0.3Ltyp = 1.36;    0.9Lmax = 5.90 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D):    (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 190 (K) - 315 (K)  
 0.22Ltyp - 1.42Lmax



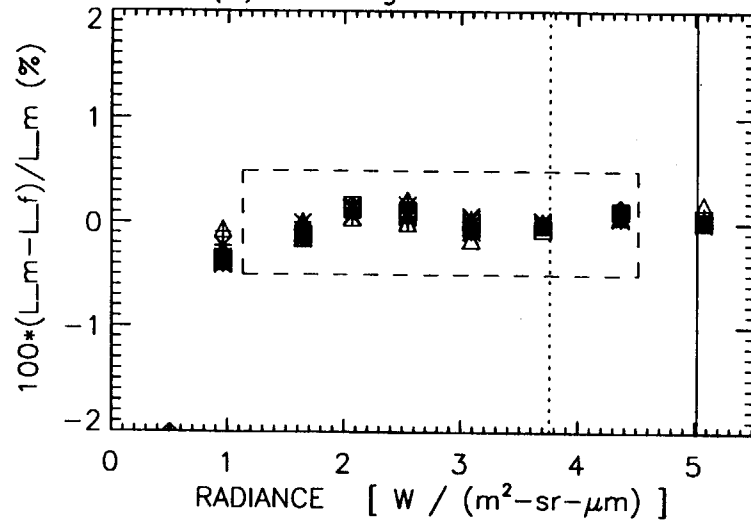
# Band 34 Calibration Fitting Summary



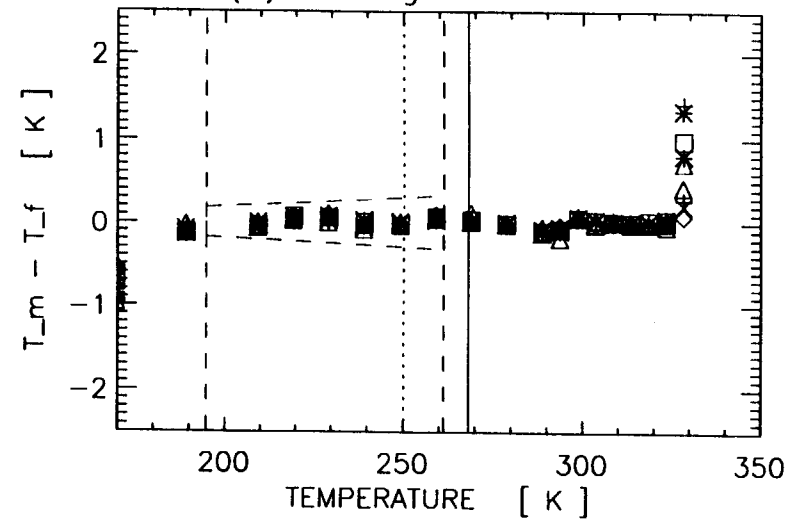
Instrument Temperature	# of BCS levels used	Cold Plateau (256K)	Nominal 1 (273K)	Nominal 2 (273K)	Hot Plateau (283K)
Quadratic Fitting (190 K - 315 K)	15				

B34 L vs DN Quadratic Fitting; Cold Plateau (256 K); UAID: 1315 - 1337

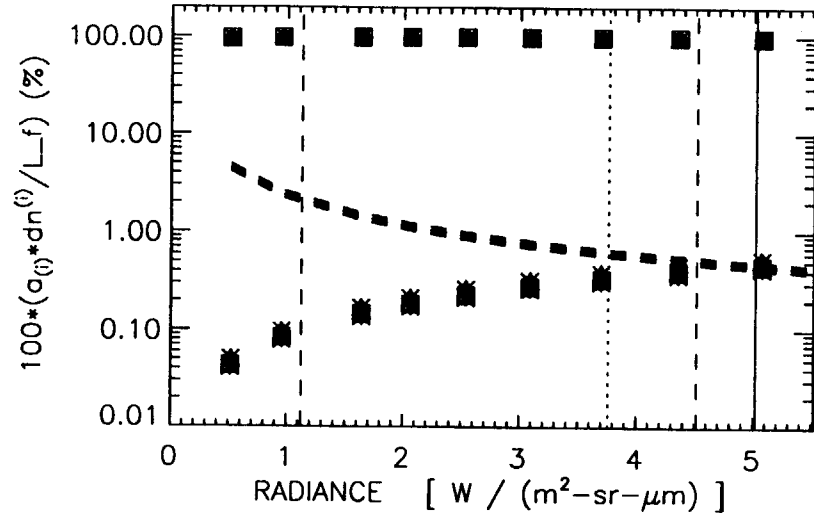
(A) Fitting Residue in L%



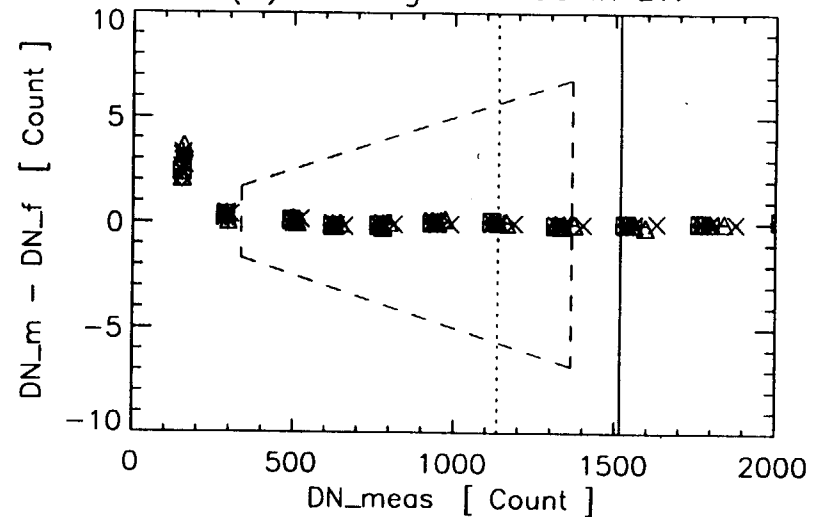
(B) Fitting Residue in T



(C) 0, 1st, 2nd Order Contribution



(D) Fitting Residue in DN

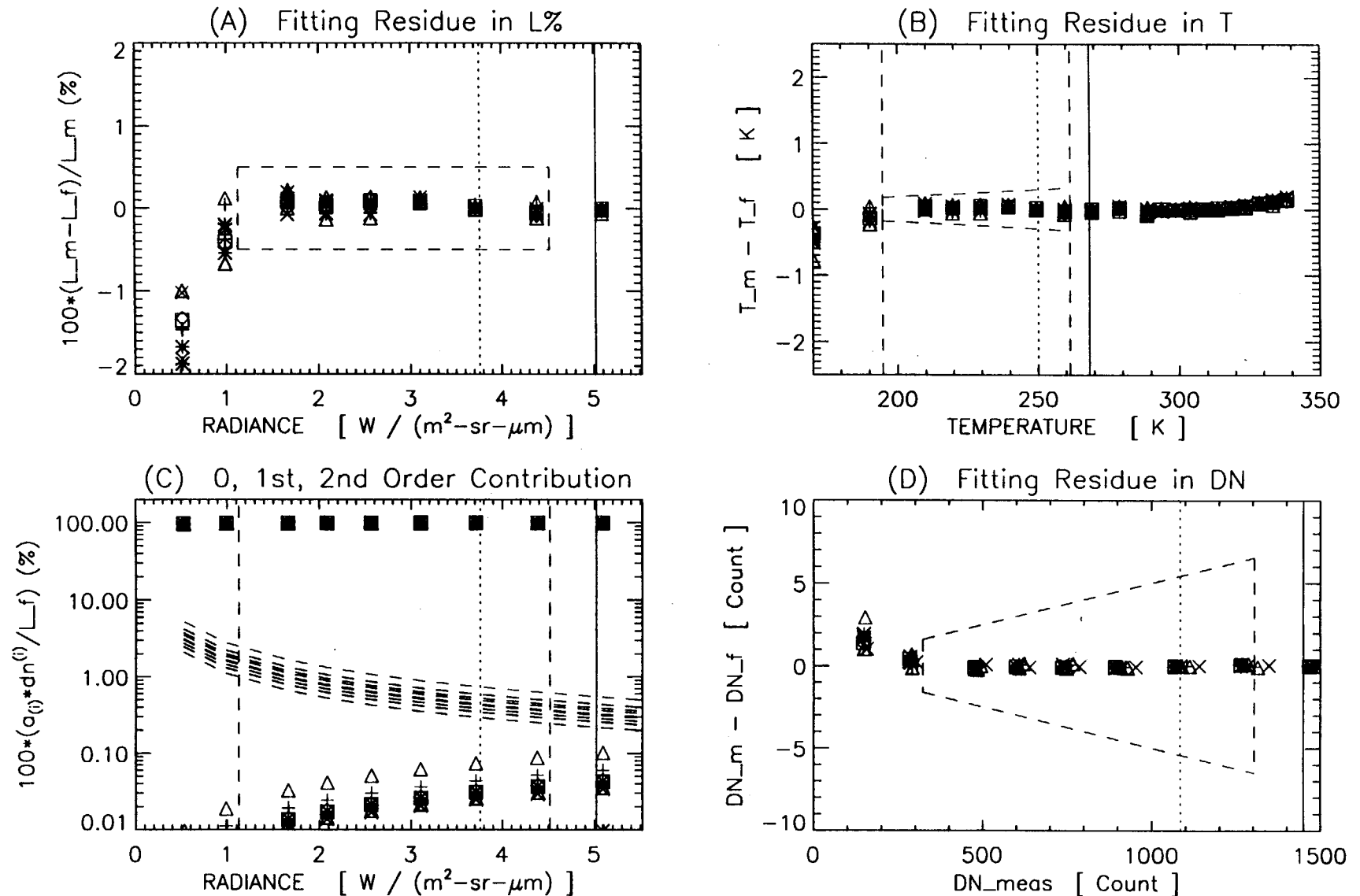


Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 L<sub>typ</sub> = 3.76 (Grn Dotted Line); L<sub>max</sub> = 5.02 (Red Solid Line)  
 0.3L<sub>typ</sub> = 1.13; 0.9L<sub>max</sub> = 4.52 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3L<sub>typ</sub> - 0.9L<sub>max</sub>) × ±1/2 Goal\*

Fitting Range: 190 (K) - 315 (K)  
 0.25L<sub>typ</sub> - 1.79L<sub>max</sub>



B34 L vs DN Quadratic Fitting; Nominal Plateau 1 (273 K); UAID: 1506 – 1526

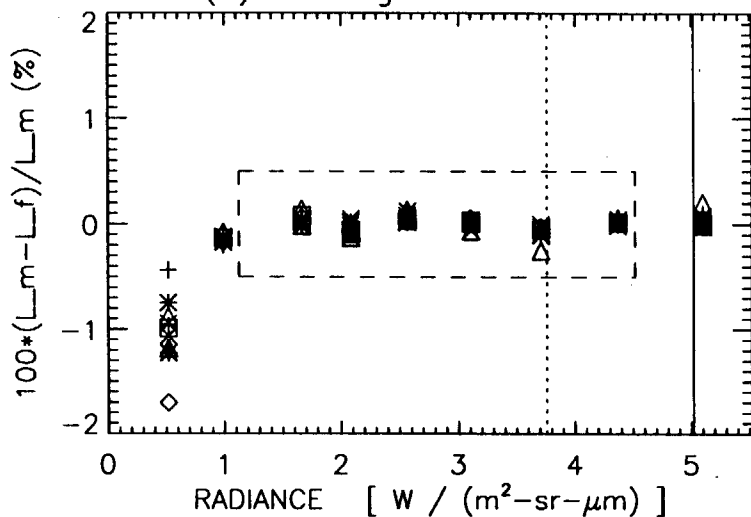


Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 3.76 (Grn Dotted Line); Lmax = 5.02 (Red Solid Line)  
 0.3Ltyp = 1.13; 0.9Lmax = 4.52 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

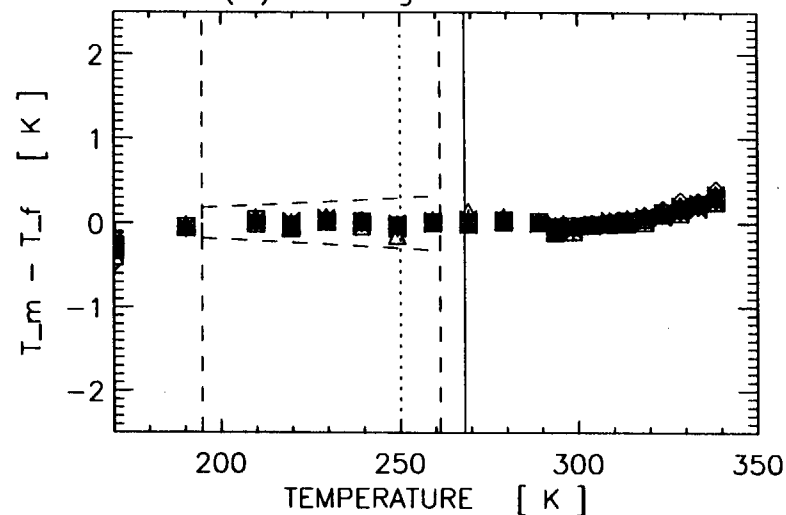
Fitting Range: 190 (K) – 315 (K)  
 0.26Ltyp - 1.79Lmax

B34 L vs DN Quadratic Fitting; Nominal Plateau 2 (273 K); UAID: 1595 – 1618

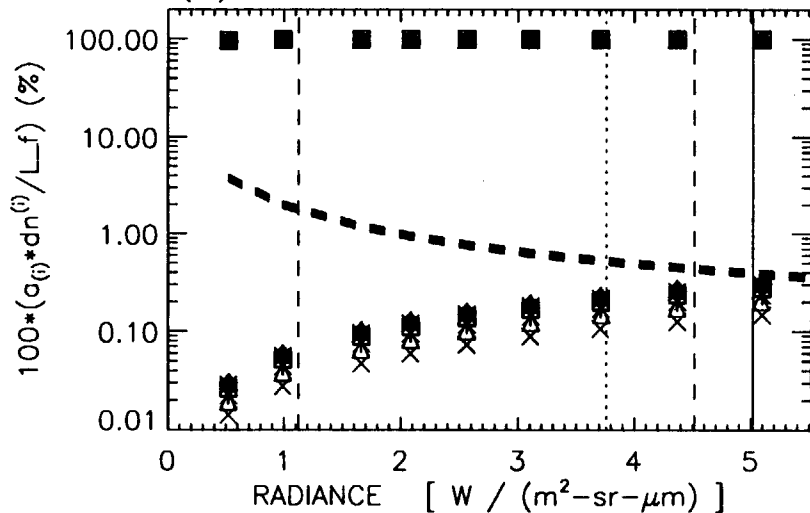
(A) Fitting Residue in L%



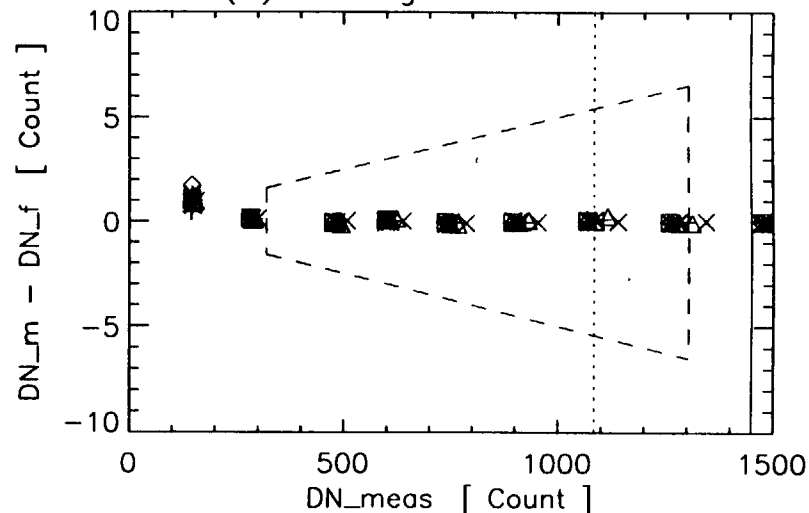
(B) Fitting Residue in T



(C) 0, 1st, 2nd Order Contribution



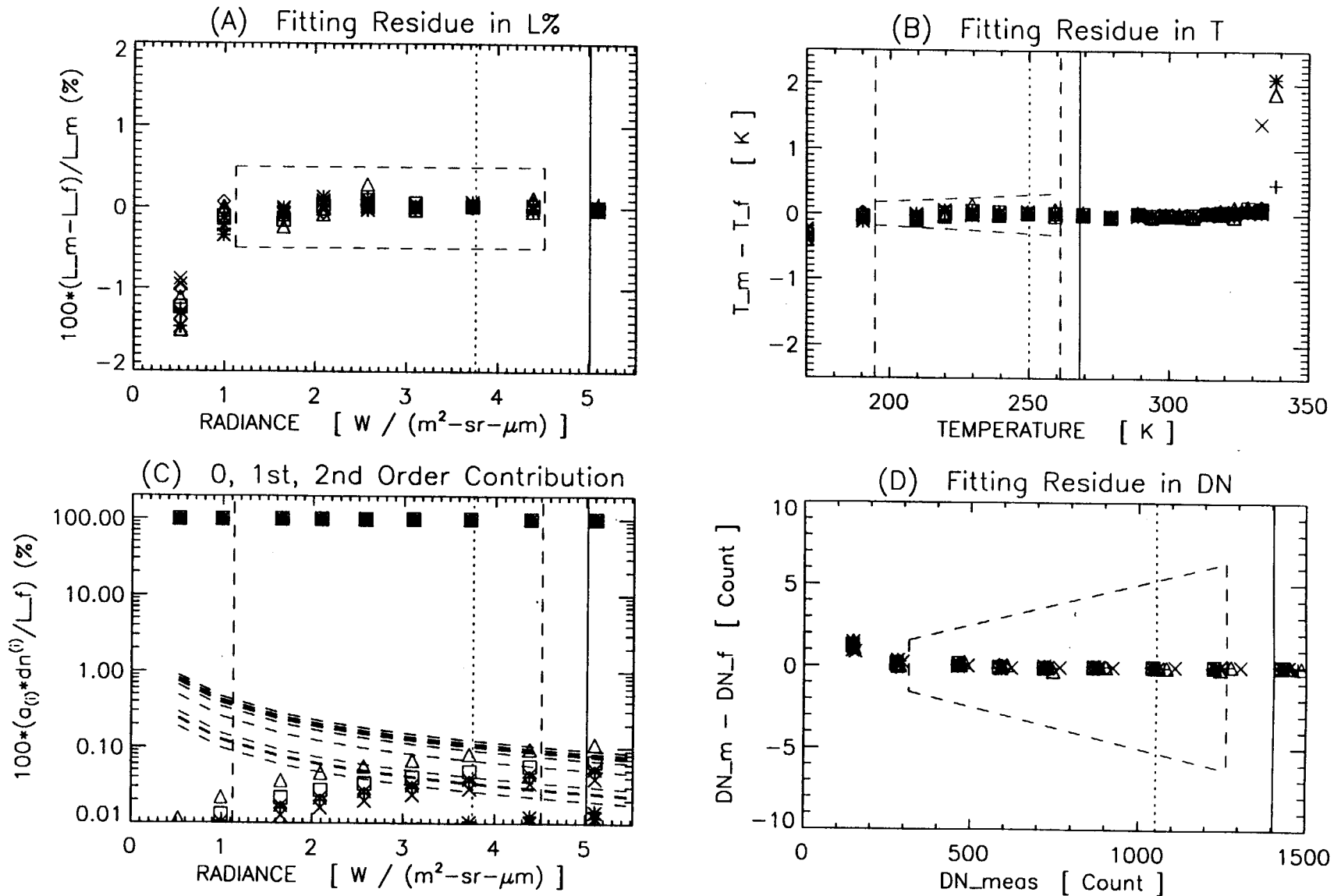
(D) Fitting Residue in DN



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 3.76 (Grn Dotted Line); Lmax = 5.02 (Red Solid Line)  
 0.3Ltyp = 1.13; 0.9Lmax = 4.52 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 190 (K) - 315 (K)  
 0.26Ltyp - 1.80Lmax

B34 L vs DN Quadratic Fitting; Hot Plateau (283 K); UAID: 1402 - 1426



Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ    Ch5: Red ◇  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*    Ch10: Red Δ  
 Ltyp = 3.76 (Grn Dotted Line);    Lmax = 5.02 (Red Solid Line)  
 0.3Ltyp = 1.13;    0.9Lmax = 4.52 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 190 (K) - 315 (K)  
 0.26Ltyp - 1.79Lmax

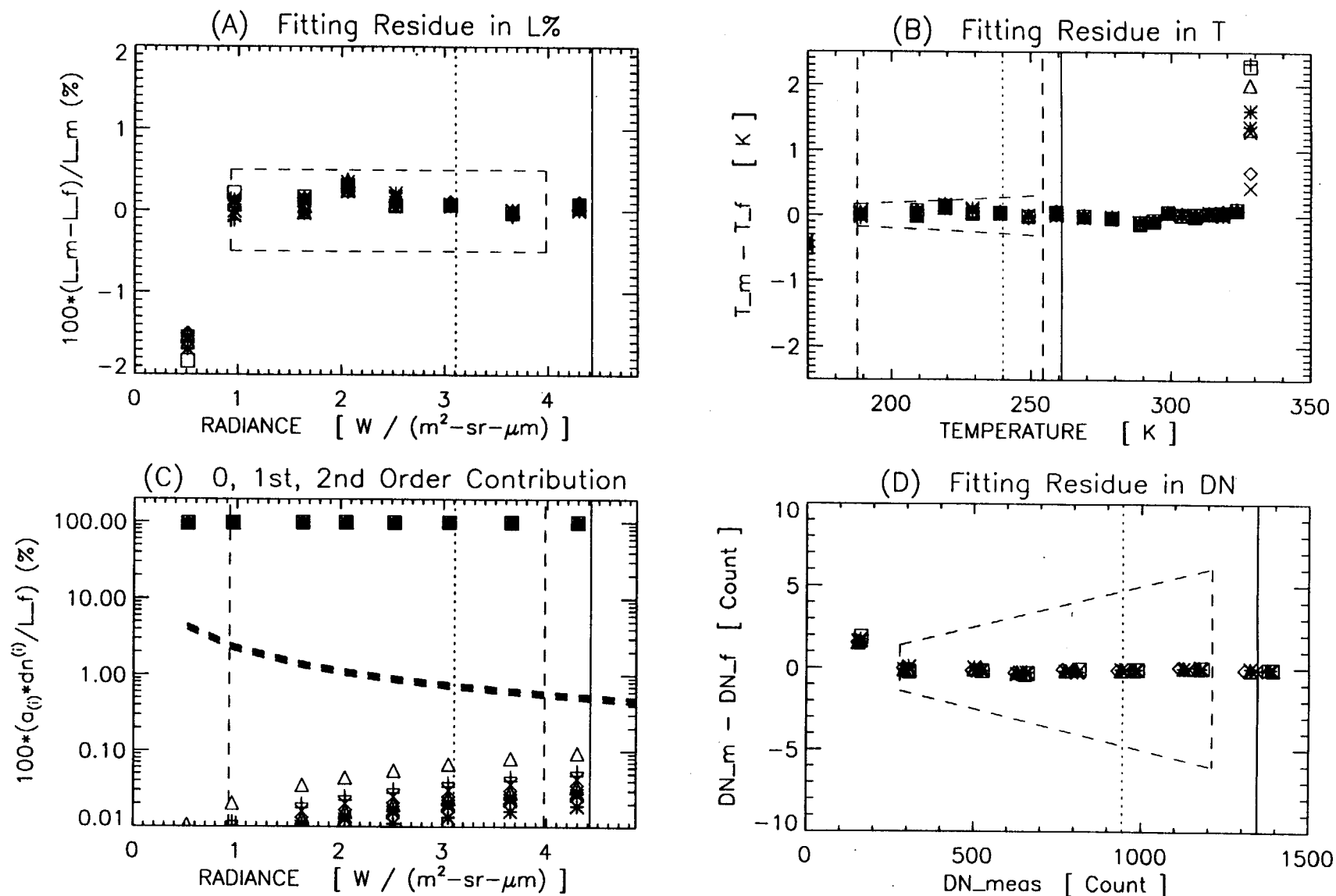


# Band 35 Calibration Fitting Summary



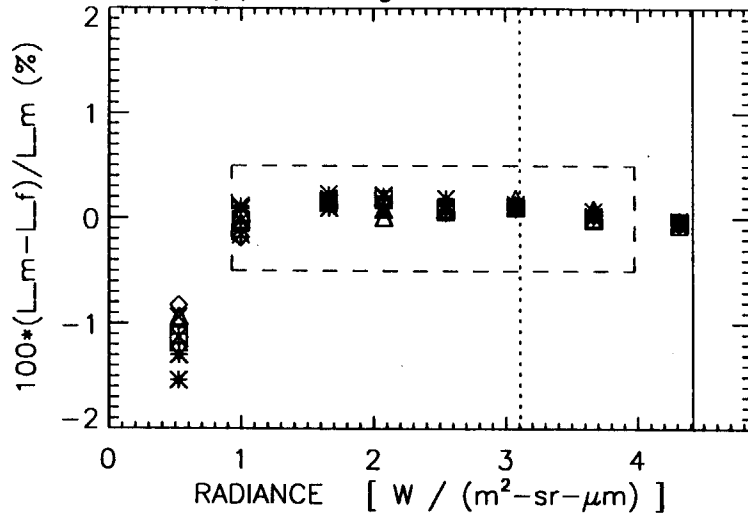
Instrument Temperature	# of BCS levels used	Cold Plateau (256K)	Nominal 1 (273K)	Nominal 2 (273K)	Hot Plateau (283K)
Quadratic Fitting (170 K - 315 K)	16				

B35 L vs DN Quadratic Fitting; Cold Plateau (256 K); UAID: 1315 - 1337

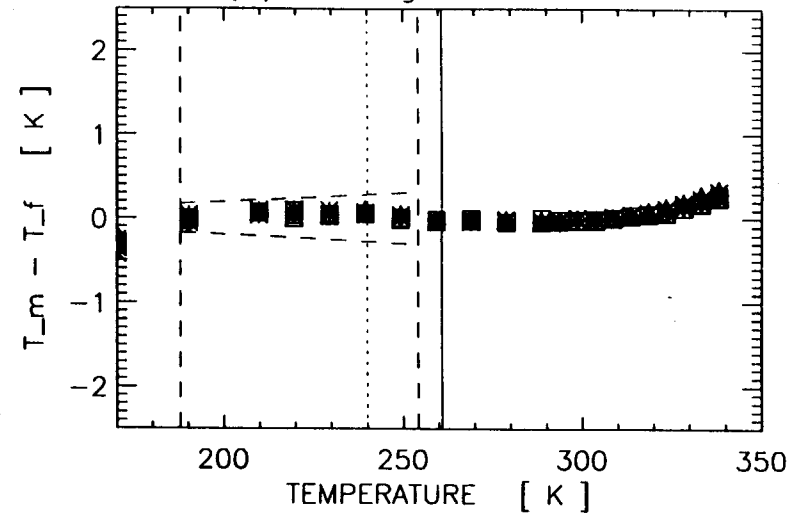


B35 L vs DN Quadratic Fitting; Nominal Plateau 1 (273 K); UAID: 1506 – 1526

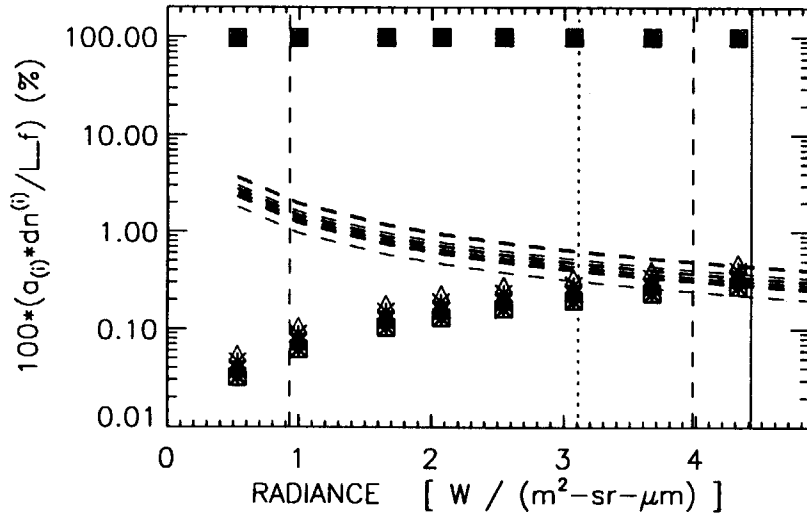
(A) Fitting Residue in L%



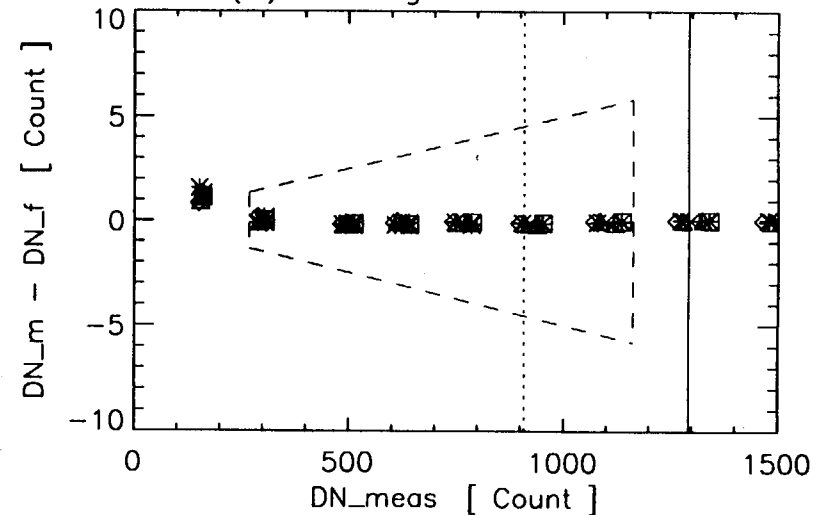
(B) Fitting Residue in T



(C) 0, 1st, 2nd Order Contribution



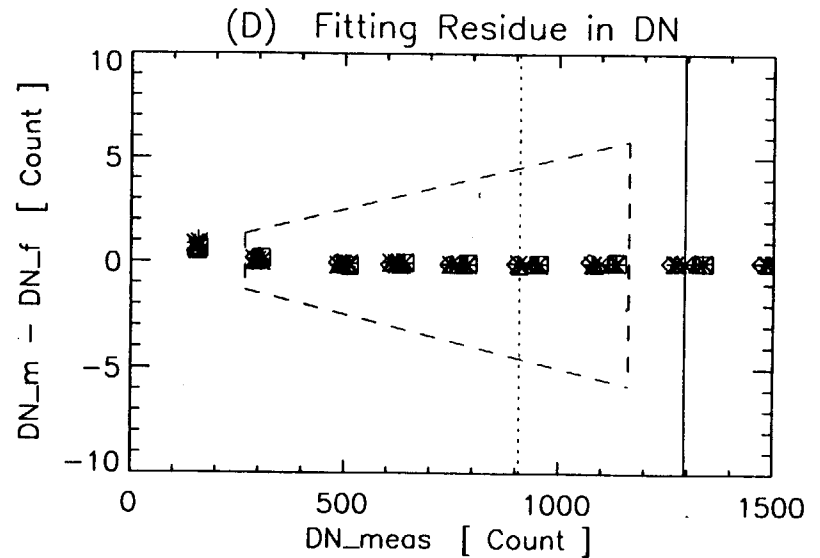
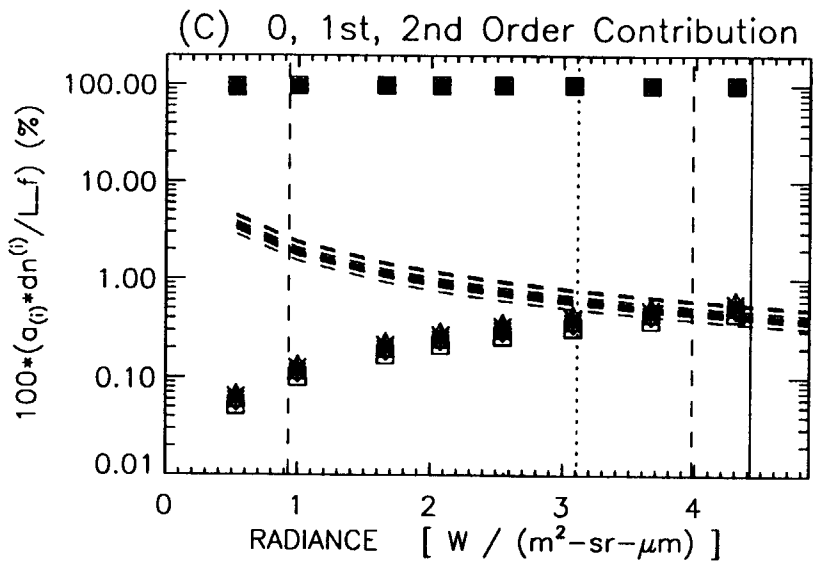
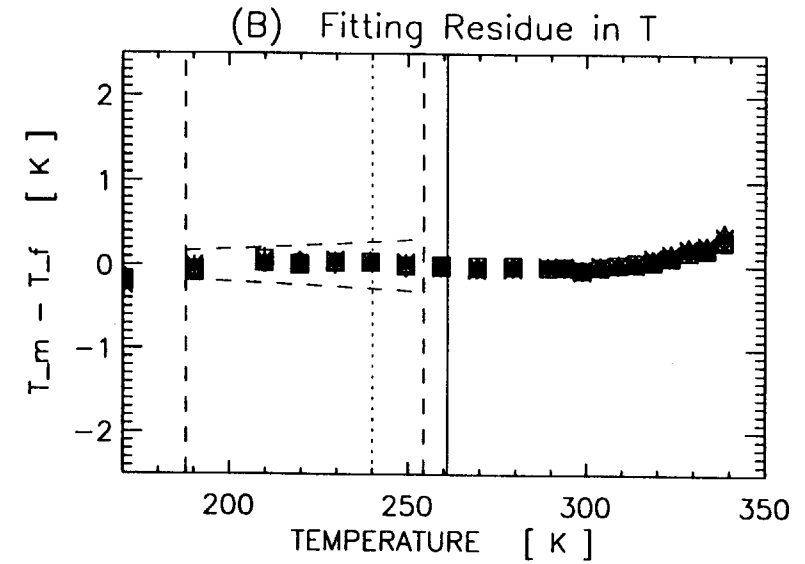
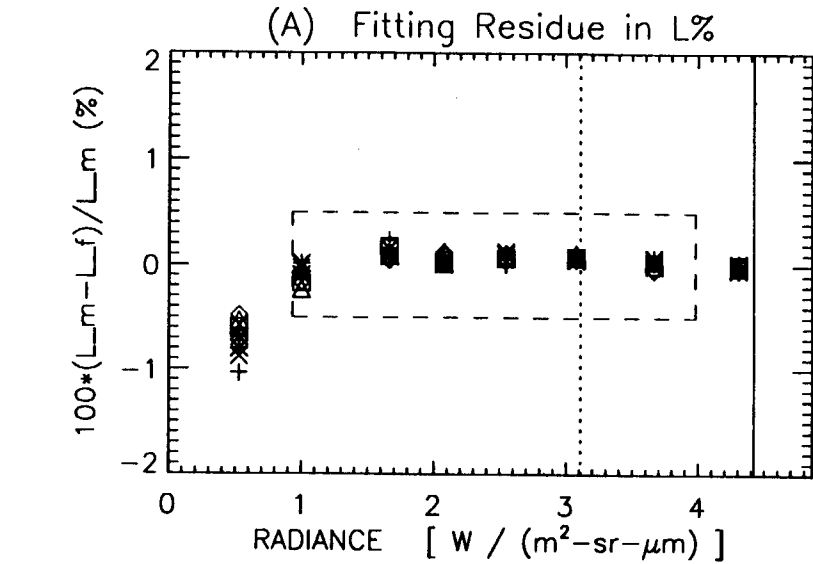
(D) Fitting Residue in DN



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 3.11 (Grn Dotted Line); Lmax = 4.42 (Red Solid Line)  
 0.3Ltyp = 0.93; 0.9Lmax = 3.98 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 170 (K) - 315 (K)  
 0.17Ltyp - 1.99Lmax

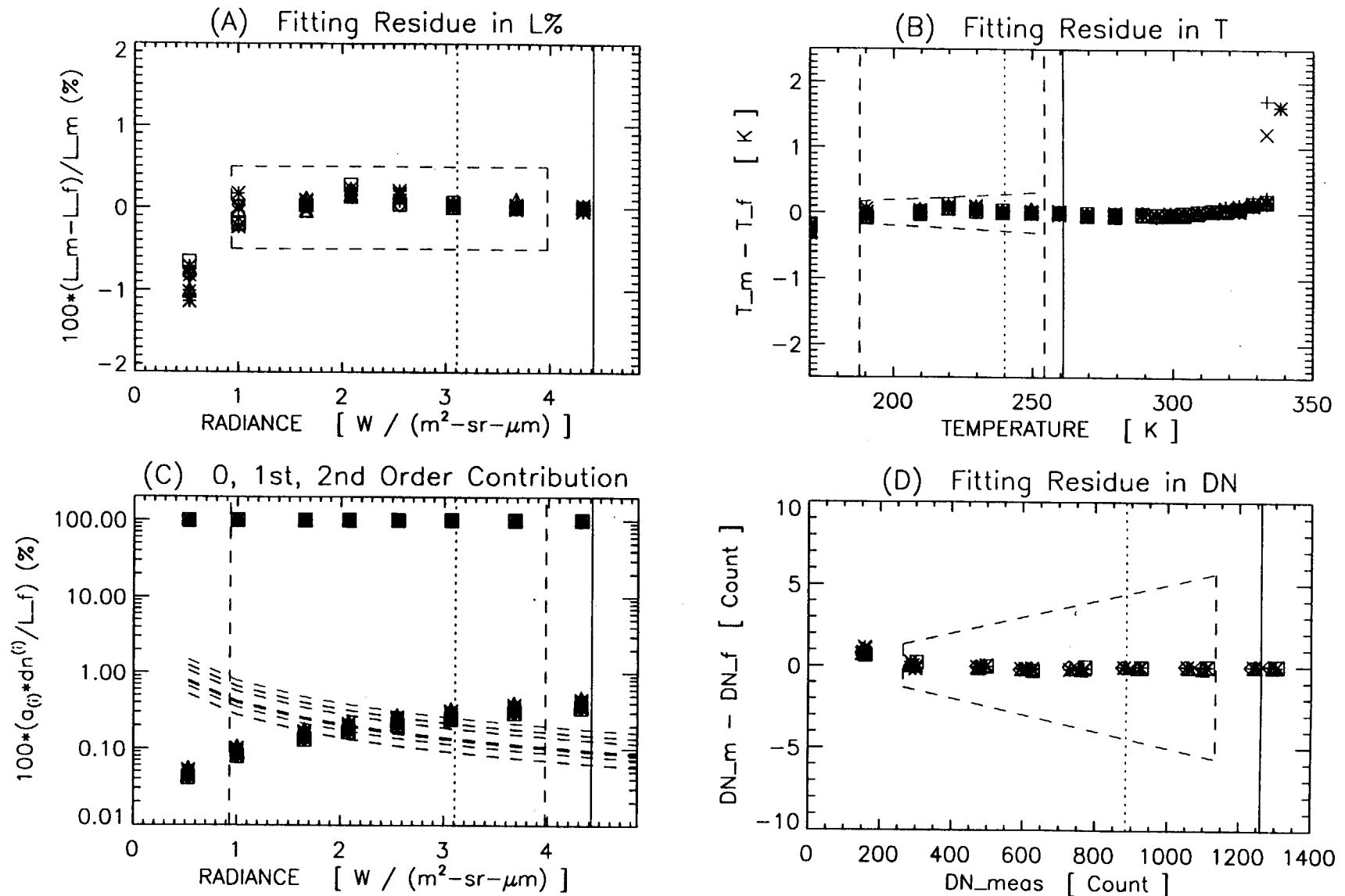
B35 L vs DN Quadratic Fitting; Nominal Plateau 2 (273 K); UAID: 1595 - 1618



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 3.11 (Grn Dotted Line); Lmax = 4.42 (Red Solid Line)  
 0.3Ltyp = 0.93; 0.9Lmax = 3.98 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 170 (K) - 315 (K)  
 0.17Ltyp - 1.99Lmax

B35 L vs DN Quadratic Fitting; Hot Plateau (283 K); UAID: 1402 - 1426



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 3.11 (Grn Dotted Line); Lmax = 4.42 (Red Solid Line)  
 0.3Ltyp = 0.93; 0.9Lmax = 3.98 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 170 (K) - 315 (K)  
 0.17Ltyp - 1.98Lmax



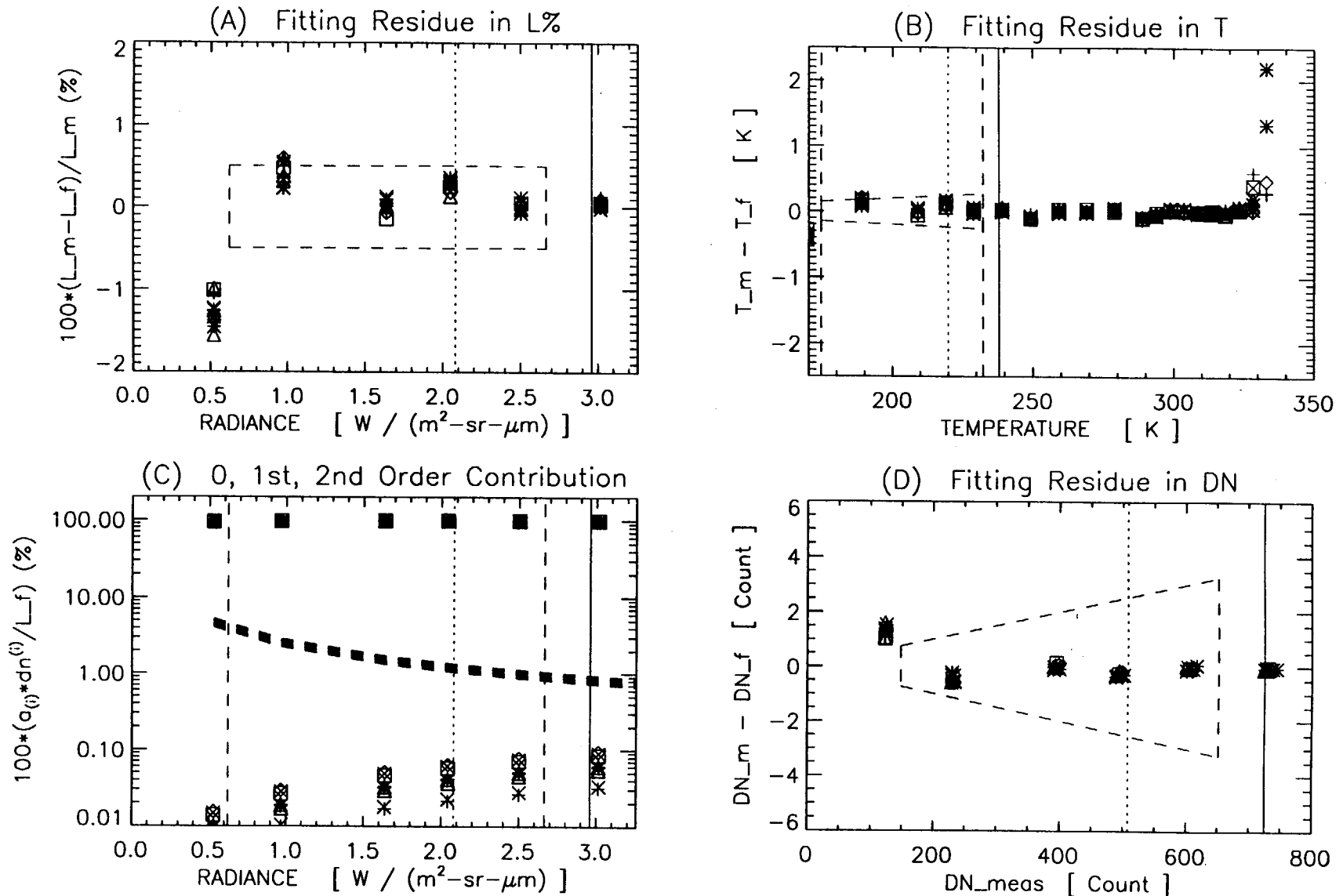


# Band 36 Calibration Fitting Summary



Instrument Temperature	# of BCS levels used	Cold Plateau (256K)	Nominal 1 (273K)	Nominal 2 (273K)	Hot Plateau (283K)
Quadratic Fitting (170 K - 315 K)	16				

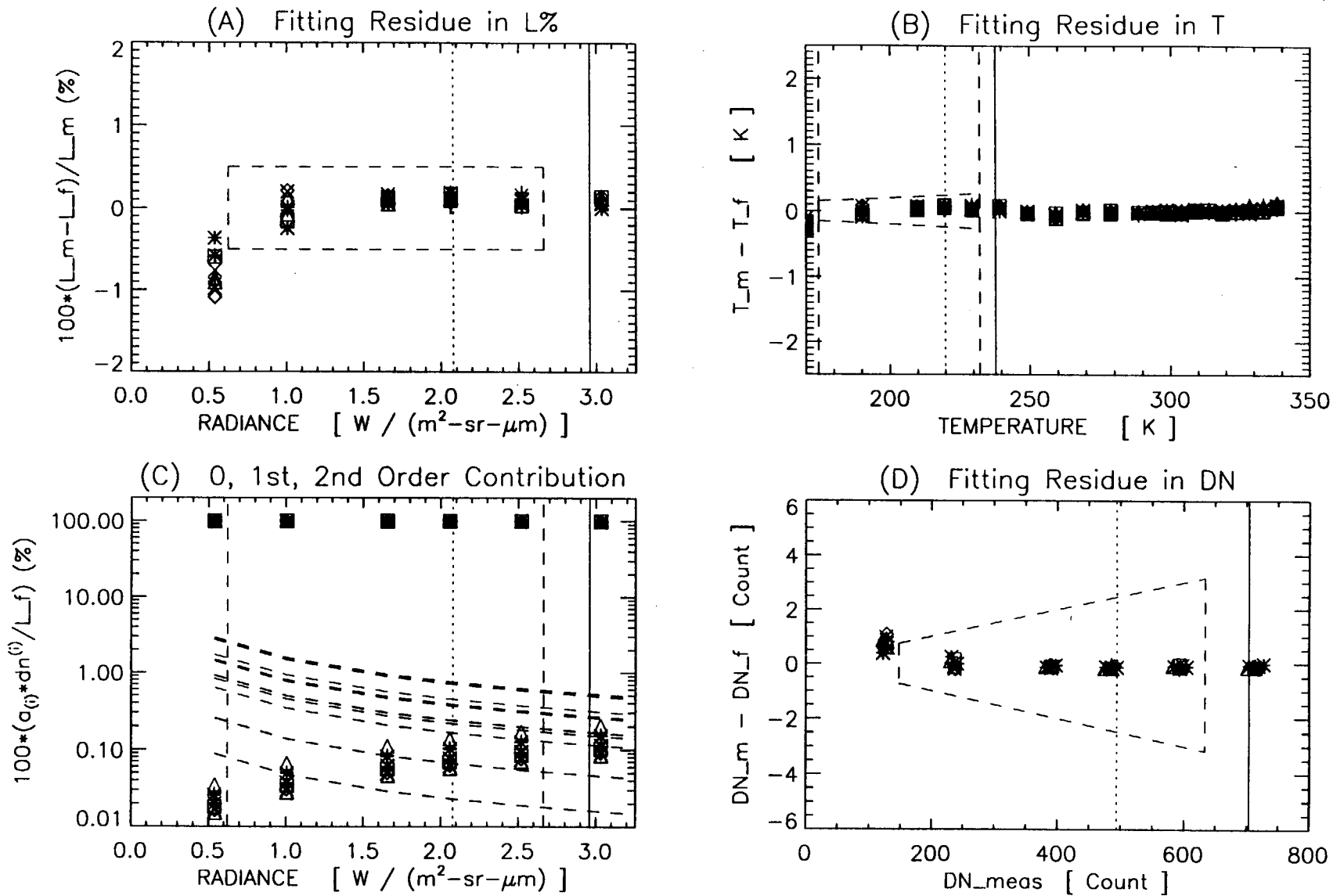
B36 L vs DN Quadratic Fitting; Cold Plateau (256 K); UAID: 1315 - 1337



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 2.08 (Grn Dotted Line); Lmax = 2.96 (Red Solid Line)  
 0.3Ltyp = 0.62; 0.9Lmax = 2.66 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 170 (K) - 315 (K)  
 0.25Ltyp - 2.87Lmax

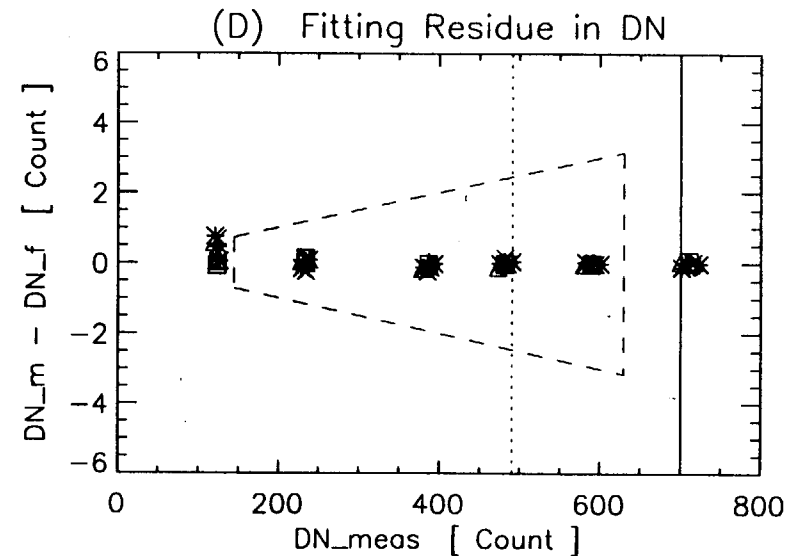
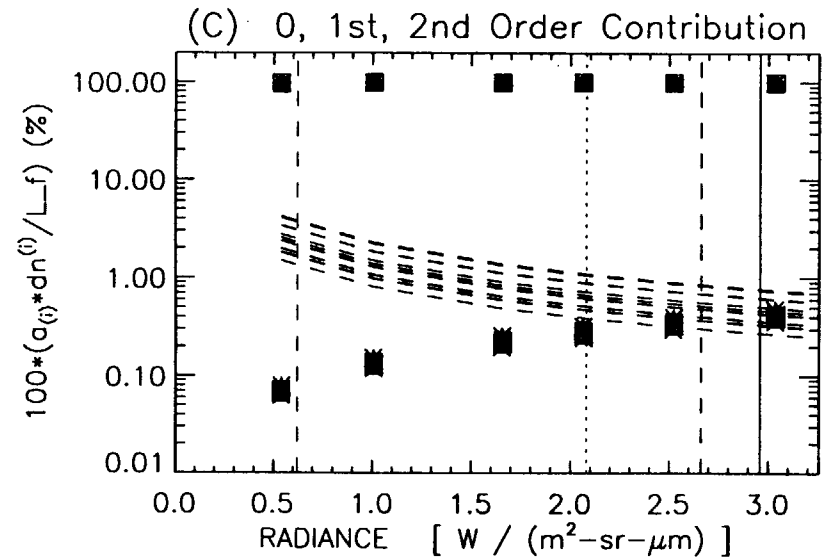
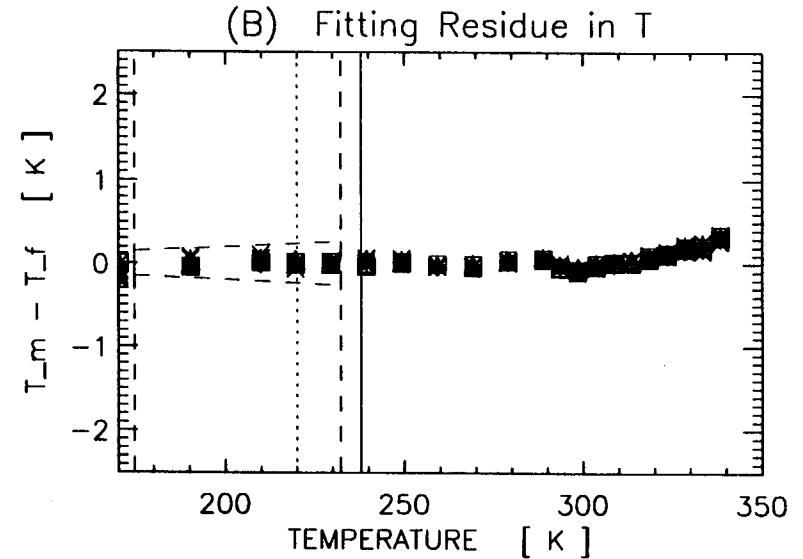
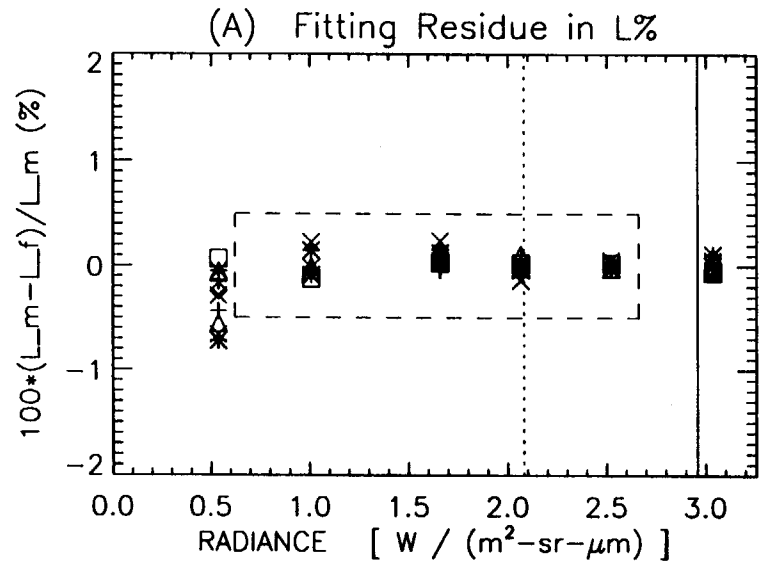
B36 L vs DN Quadratic Fitting; Nominal Plateau 1 (273 K); UAID: 1506 – 1526



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 2.08 (Grn Dotted Line); Lmax = 2.96 (Red Solid Line)  
 0.3Ltyp = 0.62; 0.9Lmax = 2.66 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp – 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 170 (K) – 315 (K)  
 0.26Ltyp – 2.87Lmax

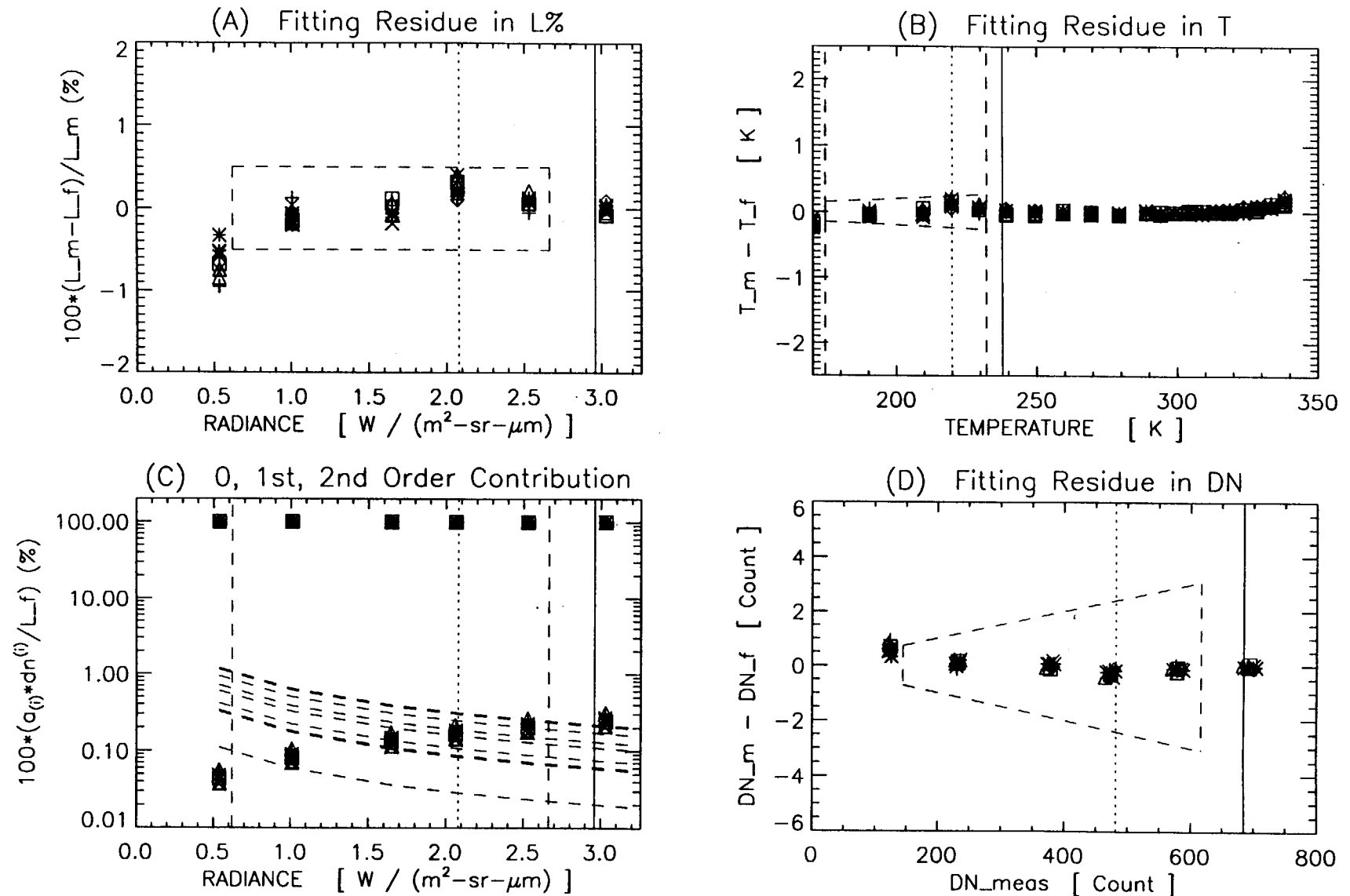
B36 L vs DN Quadratic Fitting; Nominal Plateau 2 (273 K); UAID: 1595 - 1618



Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp = 2.08 (Grn Dotted Line); Lmax = 2.96 (Red Solid Line)  
 0.3Ltyp = 0.62; 0.9Lmax = 2.66 (Red Dashed Line)  
 Dashed Line Box (Plots A,B,D): (0.3Ltyp - 0.9Lmax) x ±1/2 Goal\*

Fitting Range: 170 (K) - 315 (K)  
 0.26Ltyp - 2.87Lmax

B36 L vs DN Quadratic Fitting; Hot Plateau (283 K); UAID: 1402 - 1426



Fitting Range: 170 (K) - 315 (K)  
 0.26Ltyp - 2.87Lmax

# L1B Algorithm Demonstration



# L1B Algorithm Demonstration



- Data for four temperature plateaus processed
- Linear coefficient (a1) replaced by linear coefficient (b1) determined on-the-fly from OBC Blackbody measurements each scan cycle (averaged over 40 scans)
- Band-dependent OBC emissivity chosen for best convergence for all plateaus
- OBC temperature offset chosen for each plateau using same OBC band-dependent emissivities
- Process is iterated between emissivities and plateau-level temperature offsets



# Convergence Equation Used to Graphically Determine OBC Emissivities and Temperature Offsets



$$\frac{\tau_{sm}}{\tau_{BB}} \tau_{BB} L(T_{BB}) + \left( \frac{\tau_{sm}}{\tau_{SV}} - \frac{\tau_{sm}}{\tau_{BB}} \right) L(T_{sm}) + (1 - \tau_{BB}) \tau_{cav} \frac{\tau_{sm}}{\tau_{BB}} L(T_{cav}) =$$

$$a_0^{BCS}(B, T_{instr}) + b_1^{BB}(B, T_{instr}) \tau_{BB} + a_2^{BCS}(B, T_{instr}) (\tau_{BB})^2$$



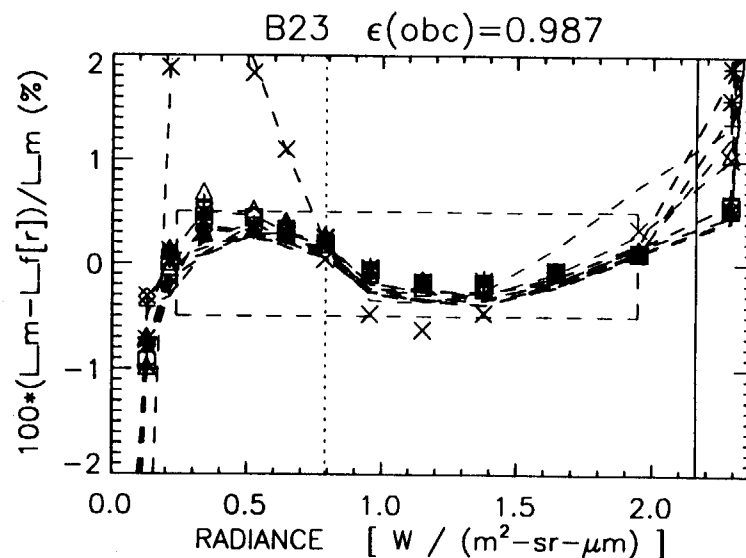
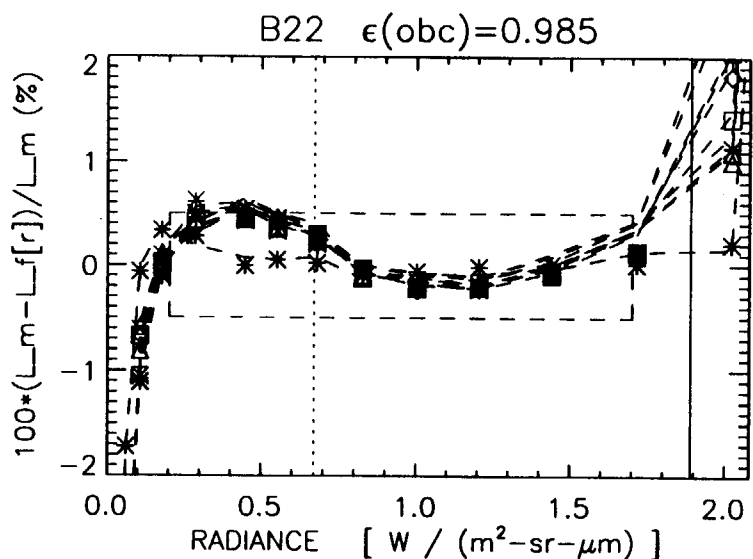
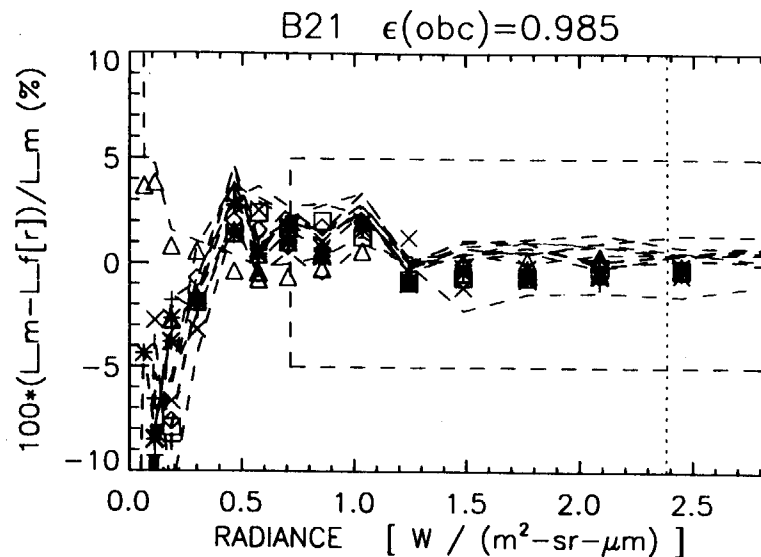
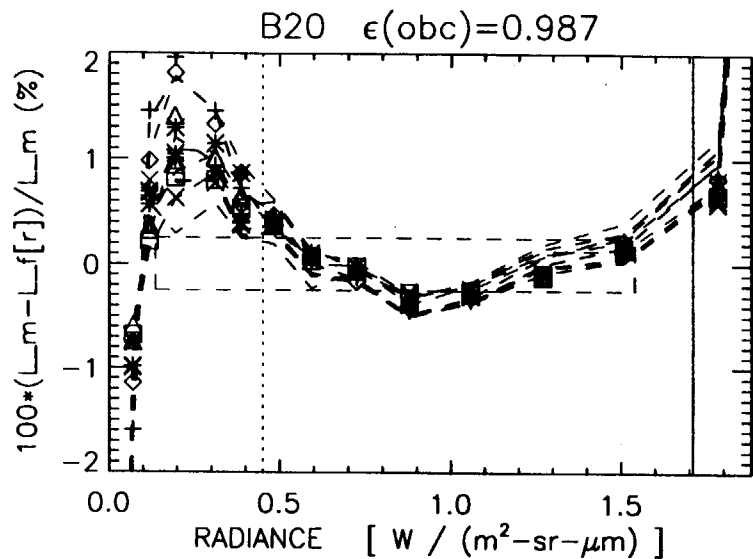


# Summary of OBC Blackbody Parameters Used in L1B Algorithm Demo



Instrument	OBC Blackbody	OBC Blackbody Band Dependent Emissivity															
Plateau	Temperature																
Temperature	Offset (K)	20	21	22	23	24	25	27	28	29	30	31	32	33	34	35	36
Cold (256 K)	-0.050	0.987	0.985	0.985	0.987	0.985	0.985	0.992	0.997	0.987	0.987	0.992	0.997	0.997	0.997	0.997	0.997
Nom1 (273 K)	-0.260	0.987	0.985	0.985	0.987	0.985	0.985	0.992	0.997	0.987	0.987	0.992	0.997	0.997	0.997	0.997	0.997
Nom2 (273 K)	-0.340	0.987	0.985	0.985	0.987	0.985	0.985	0.992	0.997	0.987	0.987	0.992	0.997	0.997	0.997	0.997	0.997
Hot (283 K)	-0.190	0.987	0.985	0.985	0.987	0.985	0.985	0.992	0.997	0.987	0.987	0.992	0.997	0.997	0.997	0.997	0.997

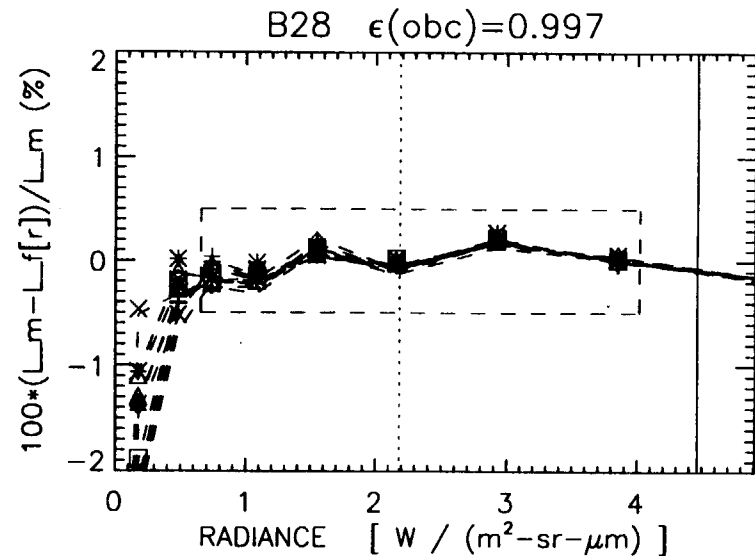
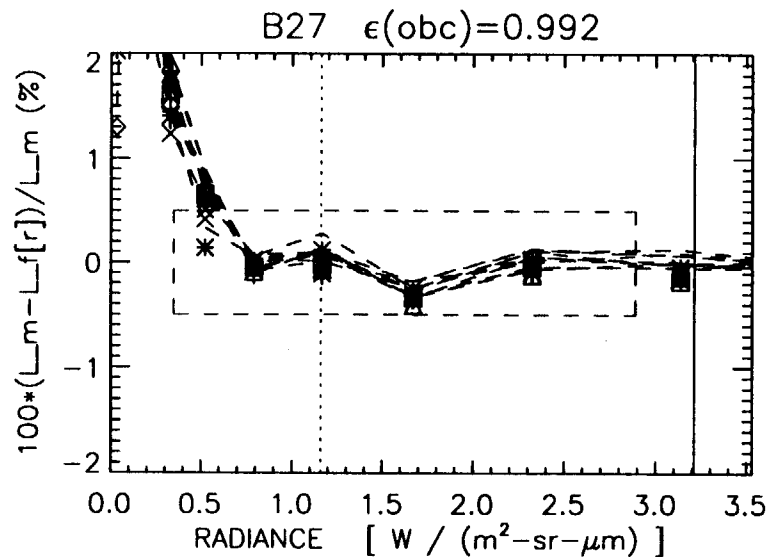
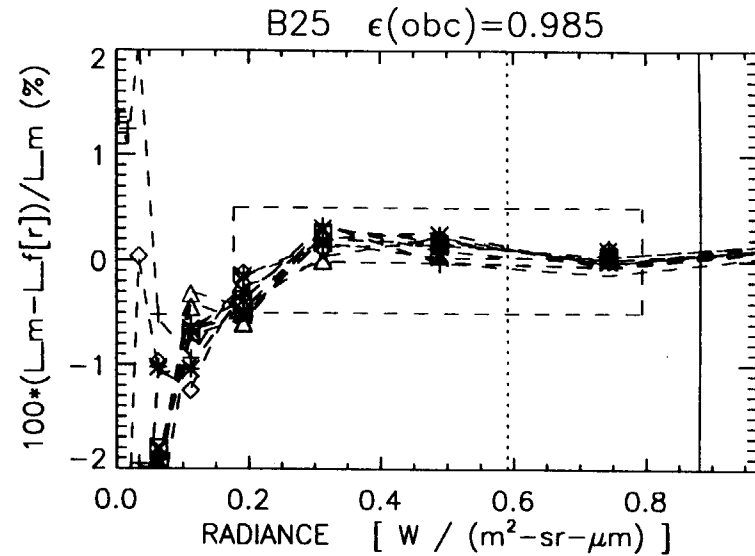
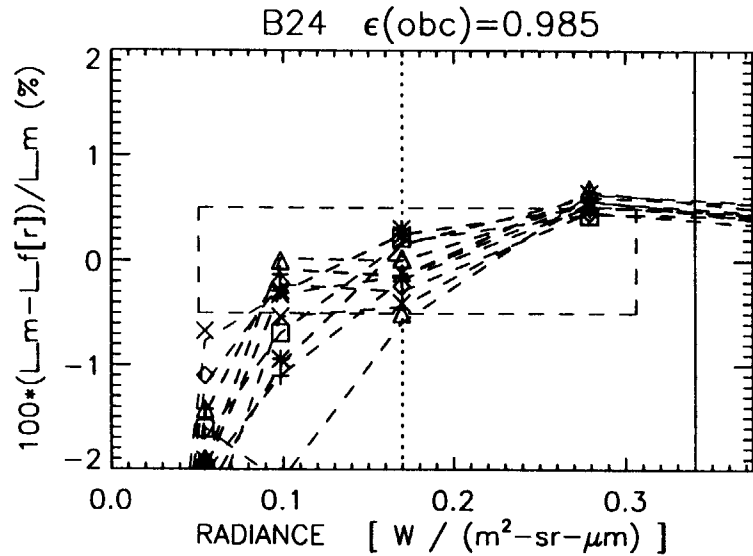
L1B Algorithm Demonstration; UAID: 1315-1337 (COLD); T(instr)~256; T(obl)~315



Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk  $\Delta$   
 Ch6: Grn  $\square$     Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*  
 Ltp: Green Dotted Line;    Lmax: Red Solid Line; Box  
 Dashed Line Box:  $(0.3L_{tp} - 0.9L_{max}) \times (\pm)1/2$  Goal\*

Ch5: Red  $\diamond$      $\Delta T(\text{bb}) = -0.050$  (K)  
 Ch10: Red  $\Delta$      $L_m$ : Measured Radiance  
                    $L_f$ : Fitting Radiance (symbols)  
                    $L_r$ : Retrieval Radiance (dashed lines)

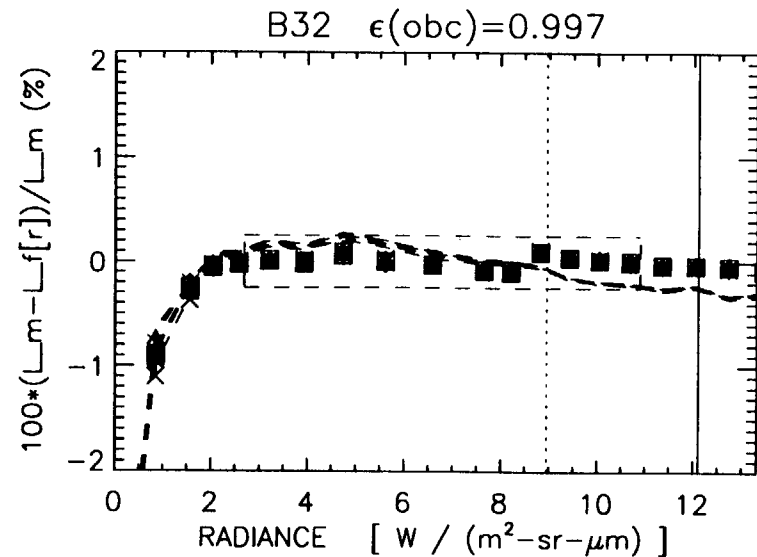
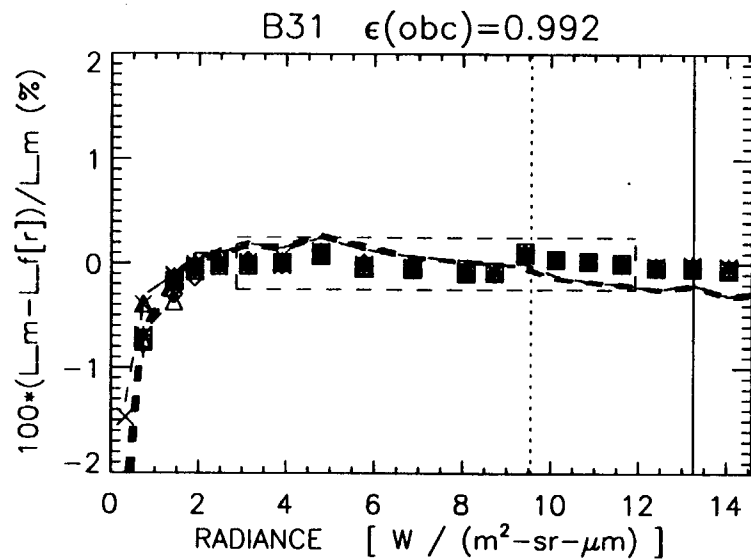
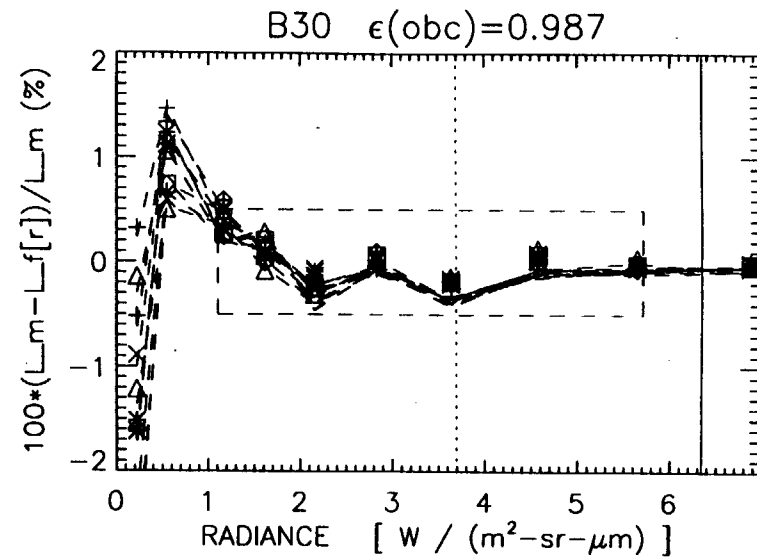
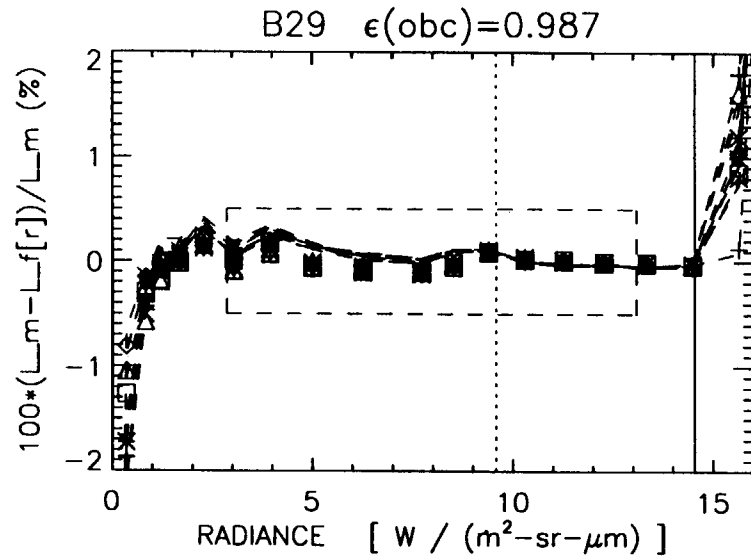
L1B Algorithm Demonstration; UAID: 1315-1337 (COLD); T(instr)~256; T(ocb)~315



Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*  
 Ltyp: Green Dotted Line;    Lmax: Red Solid Line; Box  
 Dashed Line Box:  $(0.3L_{\text{typ}} - 0.9L_{\text{max}}) \times (\pm)1/2 \text{ Goal}^*$

Ch5: Red ◇     $\Delta T(\text{bb}) = -0.050 \text{ (K)}$   
 Ch10: Red Δ     $L_m$ : Measured Radiance  
 $L_f$ : Fitting Radiance (symbols)  
 $L_r$ : Retrieval Radiance (dashed lines)

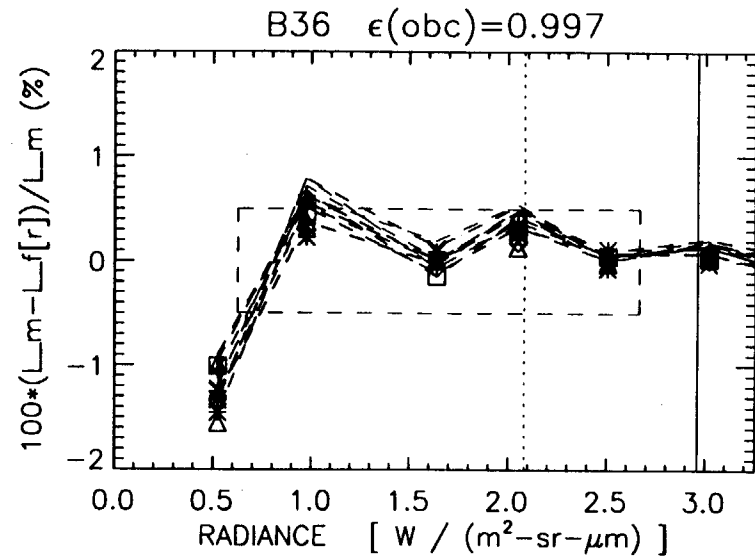
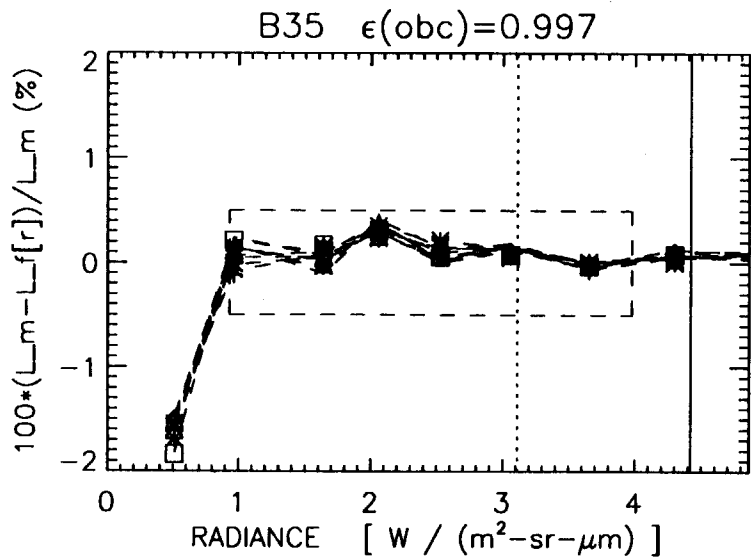
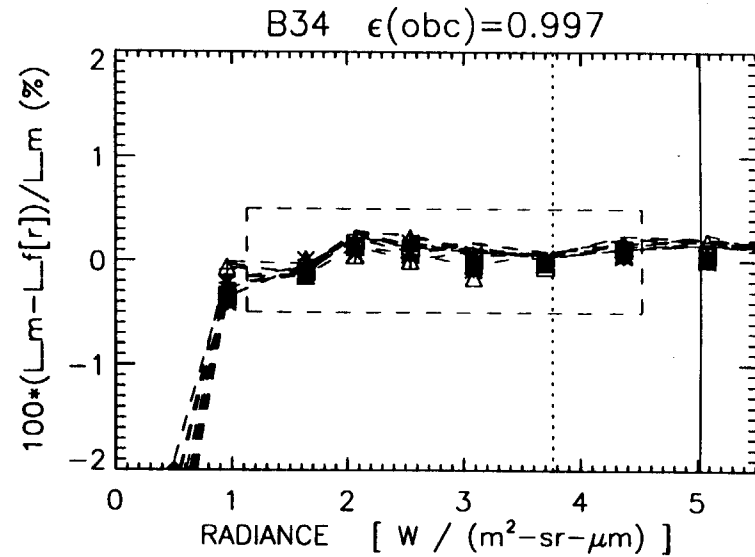
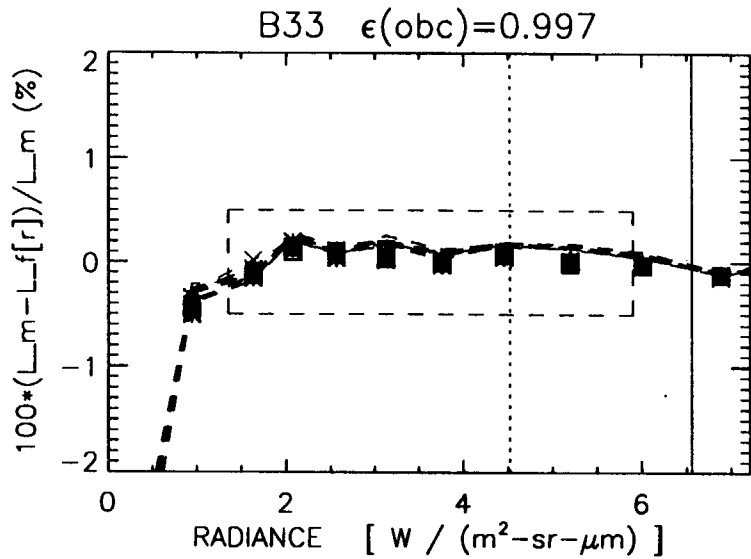
L1B Algorithm Demonstration; UAID: 1315-1337 (COLD); T(instr)~256; T(abc)~315



Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*  
 Ltyp: Green Dotted Line;    Lmax: Red Solid Line; Box  
 Dashed Line Box:  $(0.3L_{typ} - 0.9L_{max}) \times (\pm)1/2 \text{ Goal}^*$

Ch5: Red ◇     $\Delta T(\text{bb}) = -0.050 \text{ (K)}$   
 Ch10: Red Δ     $L_m$ : Measured Radiance  
                    $L_f$ : Fitting Radiance (symbols)  
                    $L_r$ : Retrieval Radiance (dashed lines)

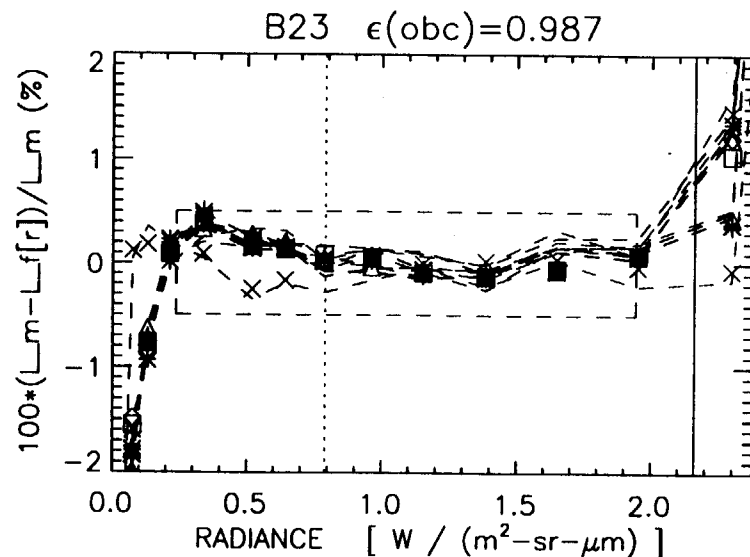
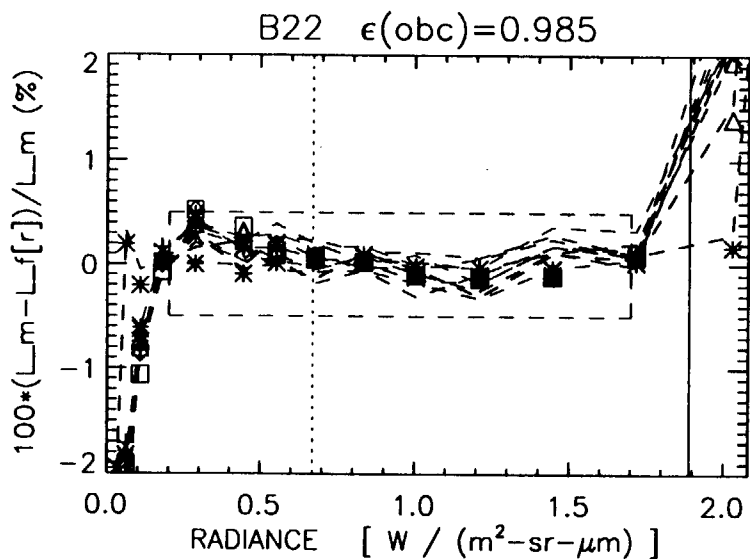
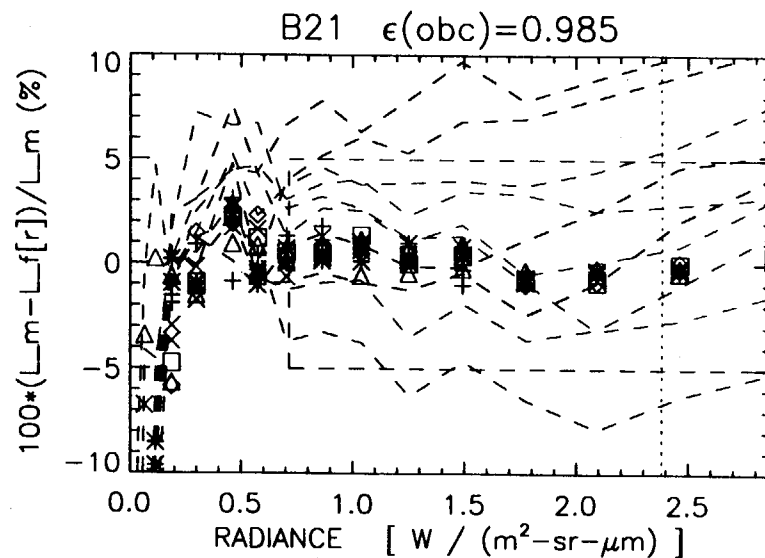
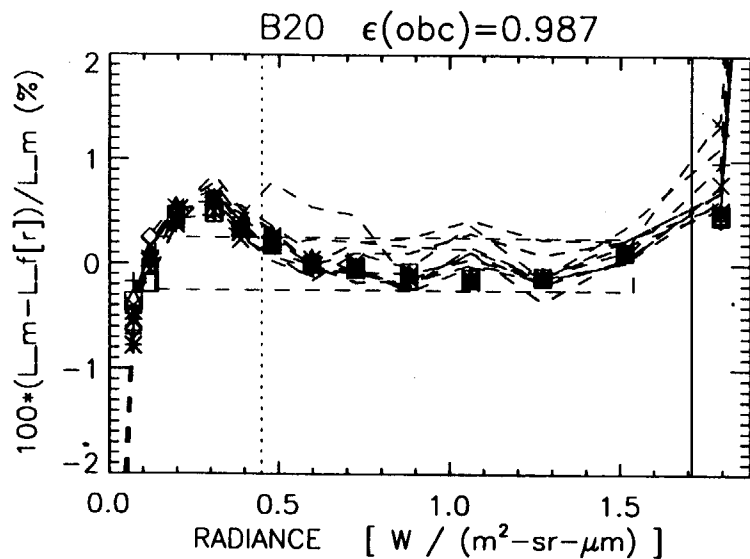
L1B Algorithm Demonstration; UAID: 1315-1337 (COLD); T(instr)~256; T(ocb)~315



Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*  
 Ltyp: Green Dotted Line;    Lmax: Red Solid Line; Box  
 Dashed Line Box:  $(0.3L_{\text{typ}} - 0.9L_{\text{max}}) \times (\pm)1/2$  Goal\*

Ch5: Red ◇     $\Delta T(\text{bb}) = -0.050$  (K)  
 Ch10: Red Δ     $L_m$ : Measured Radiance  
 $L_f$ : Fitting Radiance (symbols)  
 $L_r$ : Retrieval Radiance (dashed lines)

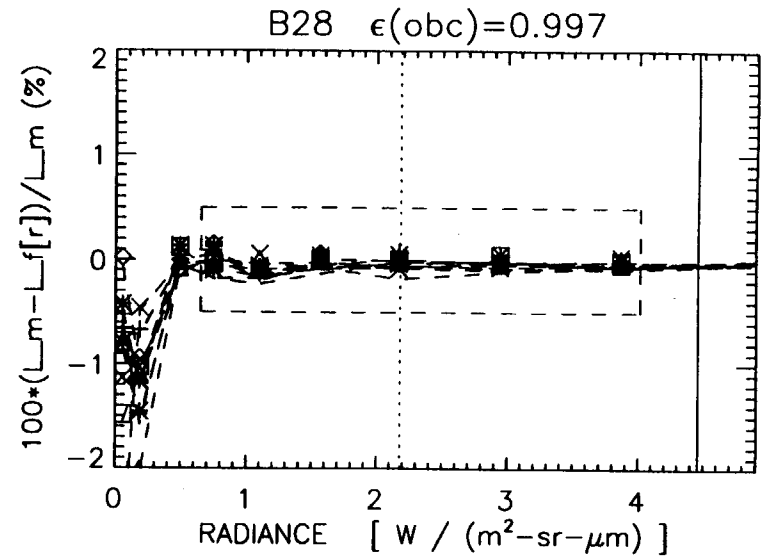
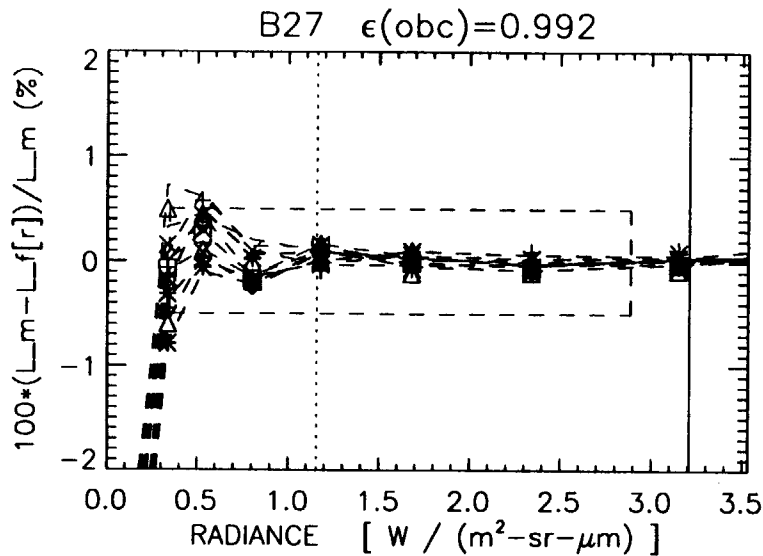
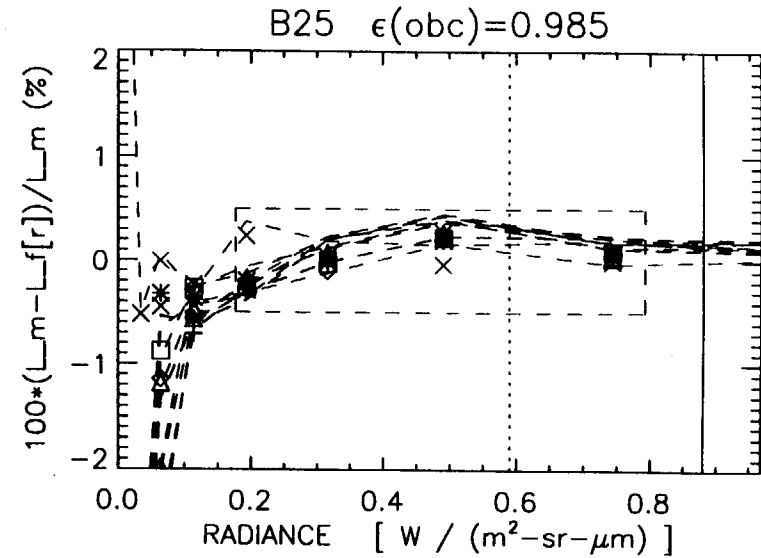
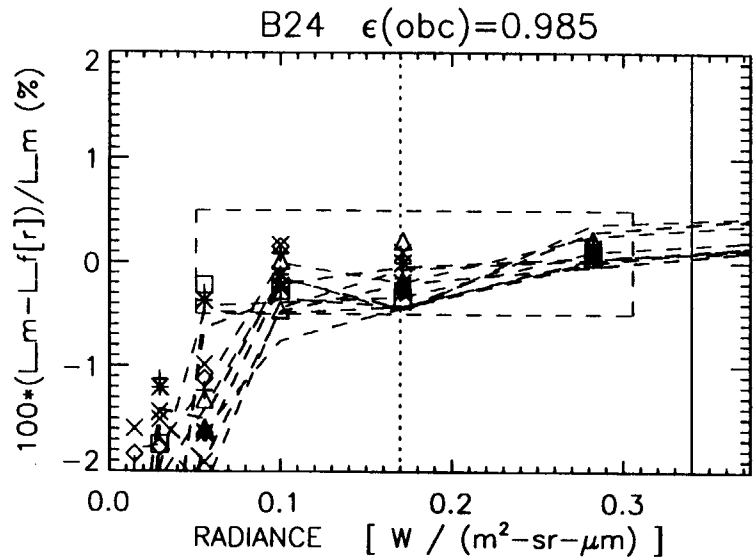
L1B Algorithm Demonstration; UAID: 1506-1526 (NOM1);  $T(\text{instr}) \sim T(\text{obc}) \sim 273$



Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk  $\Delta$   
 Ch6: Grn  $\square$     Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*  
 Ltyp: Green Dotted Line;    Lmax: Red Solid Line; Box  
 Dashed Line Box:  $(0.3L_{\text{typ}} - 0.9L_{\text{max}}) \times (\pm)1/2 \text{ Goal}^*$

Ch5: Red  $\diamond$      $\Delta T(\text{bb}) = -0.26 \text{ (K)}$   
 Ch10: Red  $\Delta$      $L_m$ : Measured Radiance  
 $L_f$ : Fitting Radiance (symbols)  
 $L_r$ : Retrieval Radiance (dashed lines)

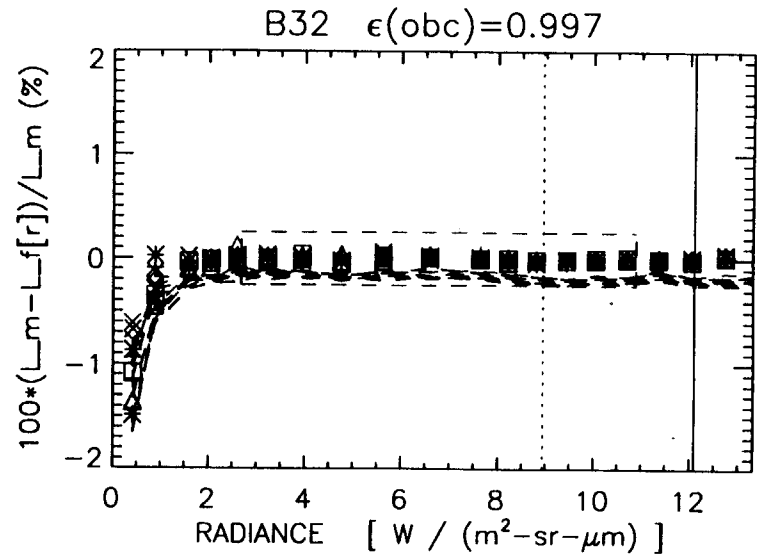
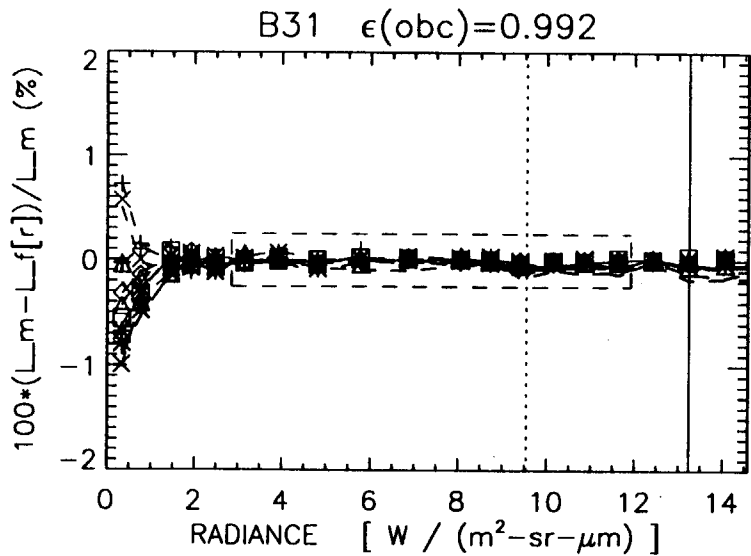
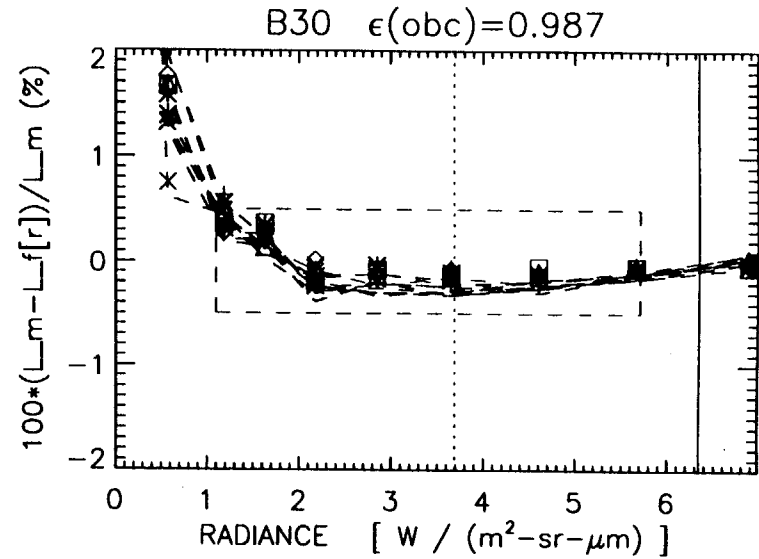
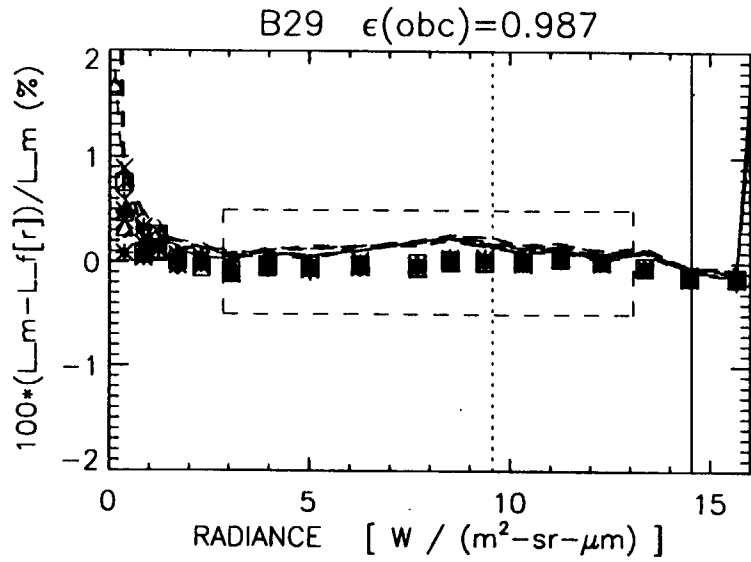
L1B Algorithm Demonstration; UAID: 1506-1526 (NOM1);  $T(\text{instr}) \sim T(\text{obc}) \sim 273$



Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*  
 Ltp: Green Dotted Line;    Lmax: Red Solid Line; Box  
 Dashed Line Box:  $(0.3L_{tp} - 0.9L_{max}) \times (\pm)1/2$  Goal\*

Ch5: Red ◇     $\Delta T(\text{bb}) = -0.26$  (K)  
 Ch10: Red Δ     $L_m$ : Measured Radiance  
                    $L_f$ : Fitting Radiance (symbols)  
                    $L_r$ : Retrieval Radinace (dashed lines)

L1B Algorithm Demonstration; UAID: 1506-1526 (NOM1);  $T(\text{instr}) \sim T(\text{obc}) \sim 273$

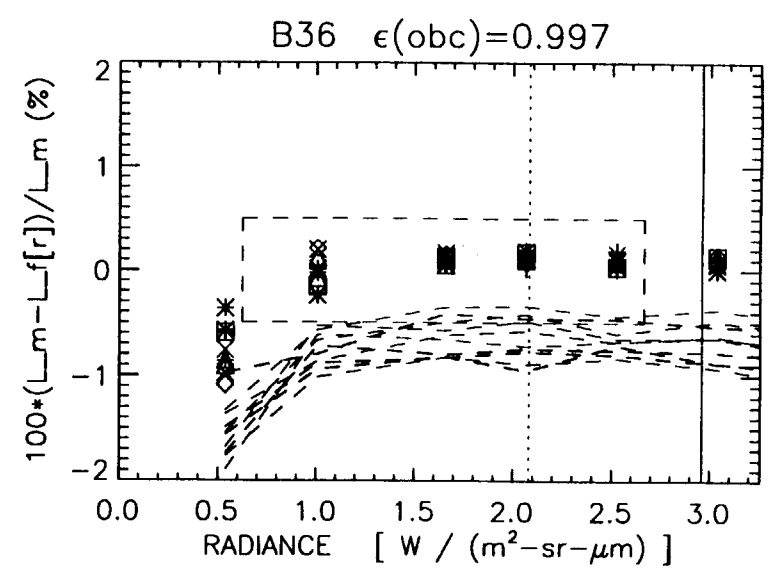
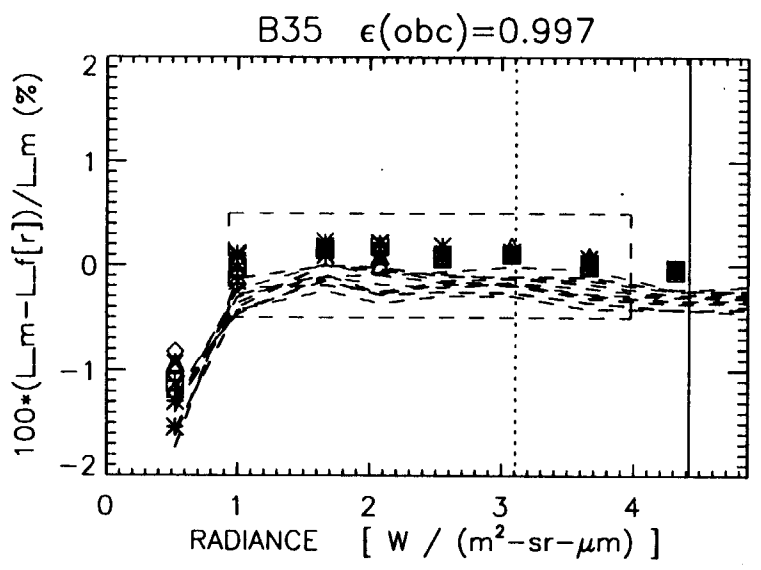
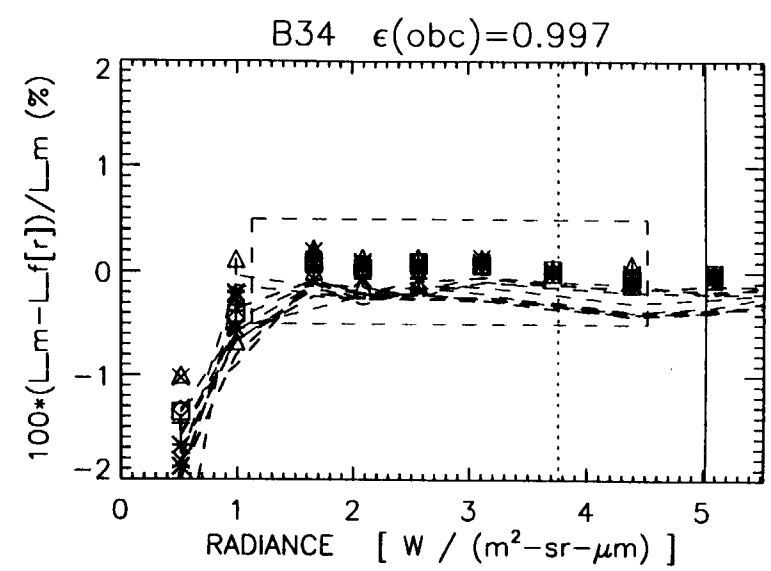
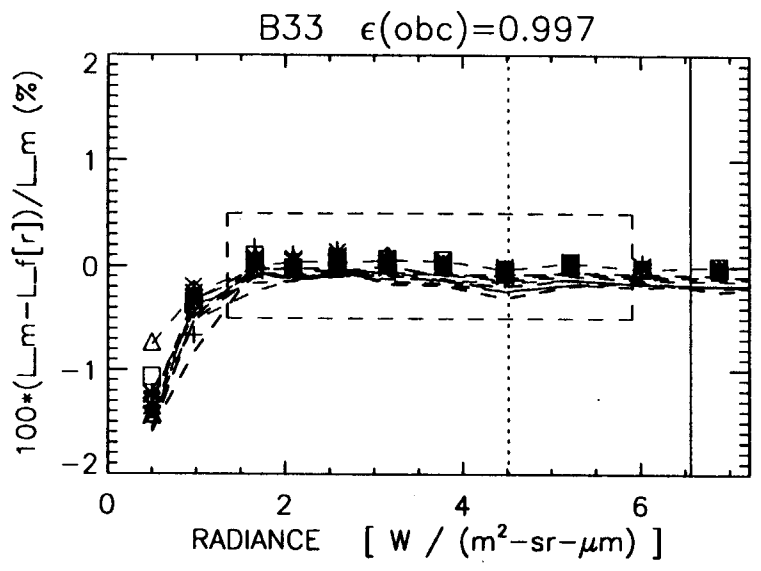


Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*  
 Ltyp: Green Dotted Line;    Lmax: Red Solid Line; Box  
 Dashed Line Box:  $(0.3L_{\text{typ}} - 0.9L_{\text{max}}) \times (\pm)1/2$  Goal\*

Ch5: Red ◇     $\Delta T(\text{bb}) = -0.26$  (K)  
 Ch10: Red Δ     $L_m$ : Measured Radiance  
                    $L_f$ : Fitting Radiance (symbols)  
                    $L_r$ : Retrieval Radinace (dashed lines)



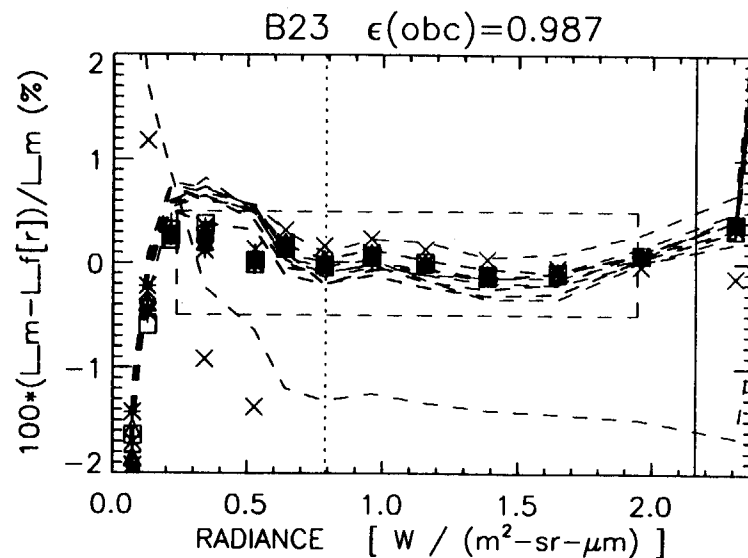
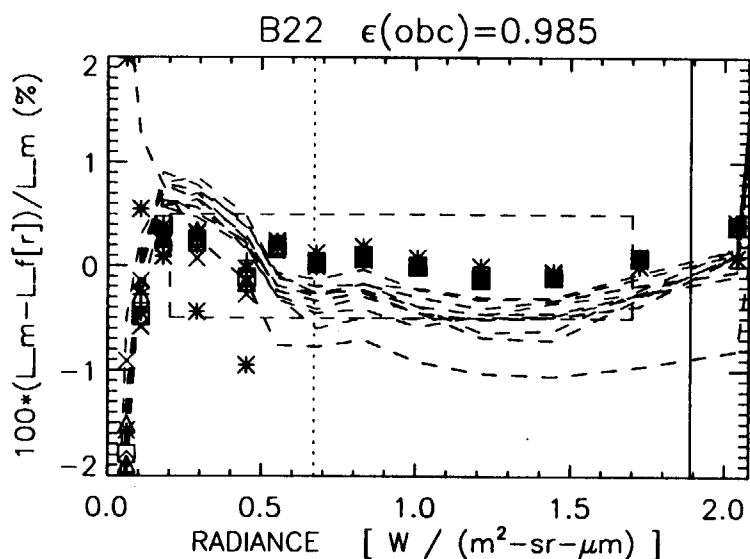
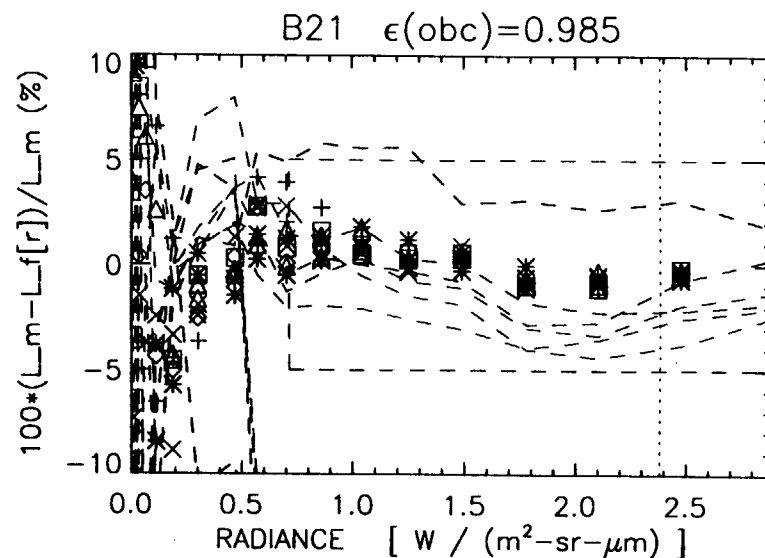
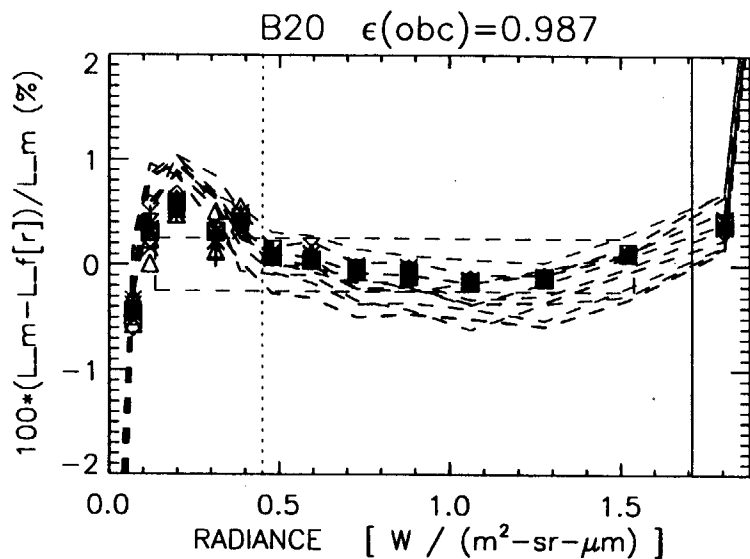
L1B Algorithm Demonstration; UAID: 1506-1526 (NOM1); T(instr)~T(obc)~273



Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*  
 Ltyp: Green Dotted Line;    Lmax: Red Solid Line; Box  
 Dashed Line Box: (0.3Ltyp - 0.9Lmax) x (±)1/2 Goal\*

Ch5: Red ◇    ΔT(bb) = -0.26 (K)  
 Ch10: Red Δ    Lm: Measured Radiance  
                   Lf: Fitting Radiance (symbols)  
                   Lr: Retrieval Radinace (dashed lines)

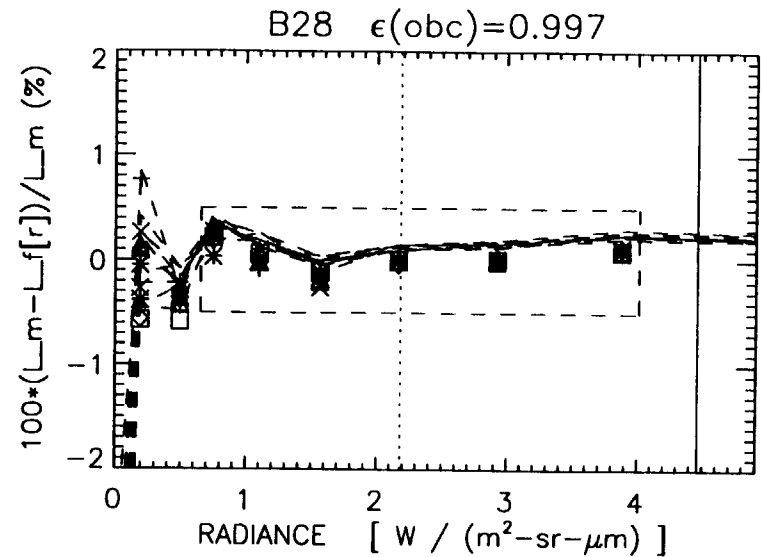
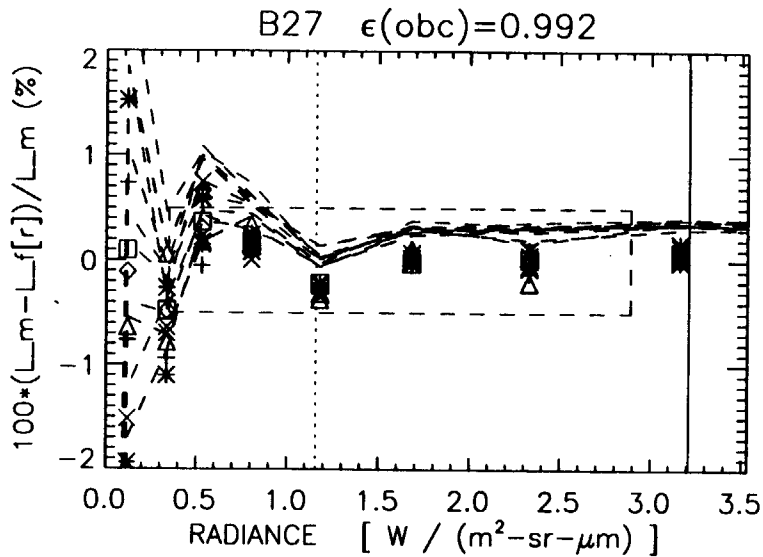
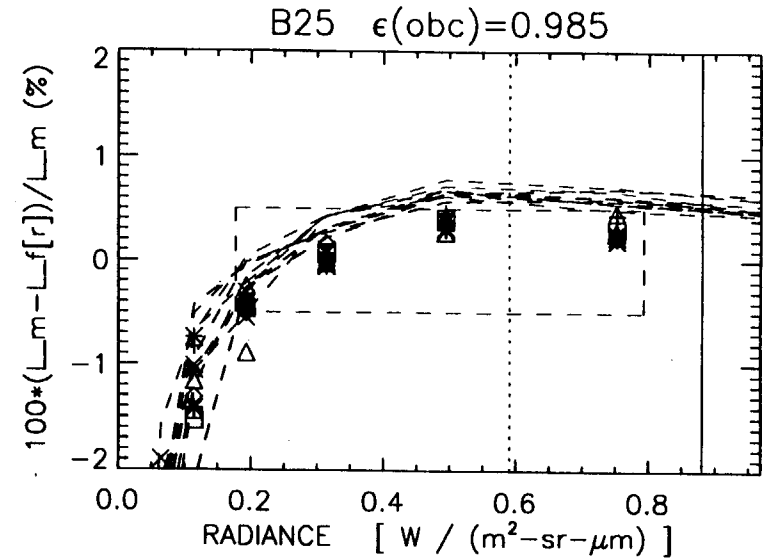
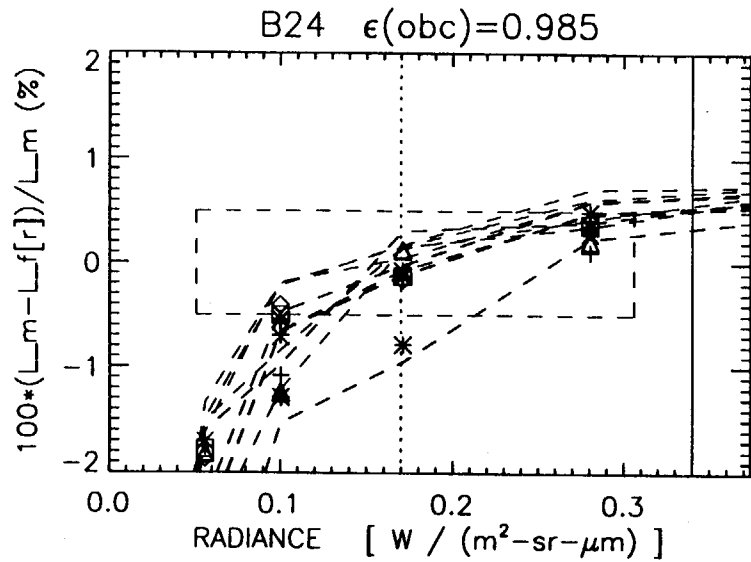
L1B Algorithm Demonstration; UAID: 1595-1618 (NOM2);  $T(\text{instr}) \sim T(\text{obc}) \sim 273$



Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*  
 Ltyp: Green Dotted Line;    Lmax: Red Solid Line; Box  
 Dashed Line Box:  $(0.3L_{\text{tpy}} - 0.9L_{\text{max}}) \times (\pm)1/2$  Goal\*

Ch5: Red ◇     $\Delta T(\text{bb}) = -0.34$  (K)  
 Ch10: Red Δ     $L_m$ : Measured Radiance  
 $L_f$ : Fitting Radiance (symbols)  
 $L_r$ : Retrieval Radinace (dashed lines)

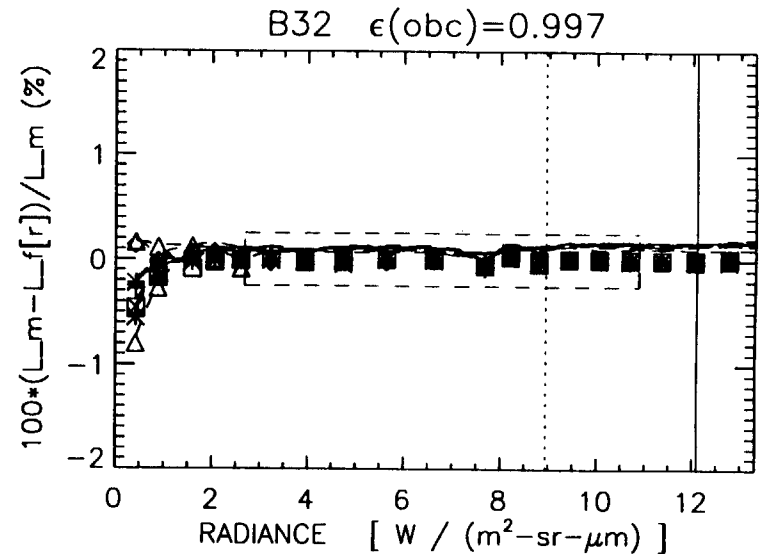
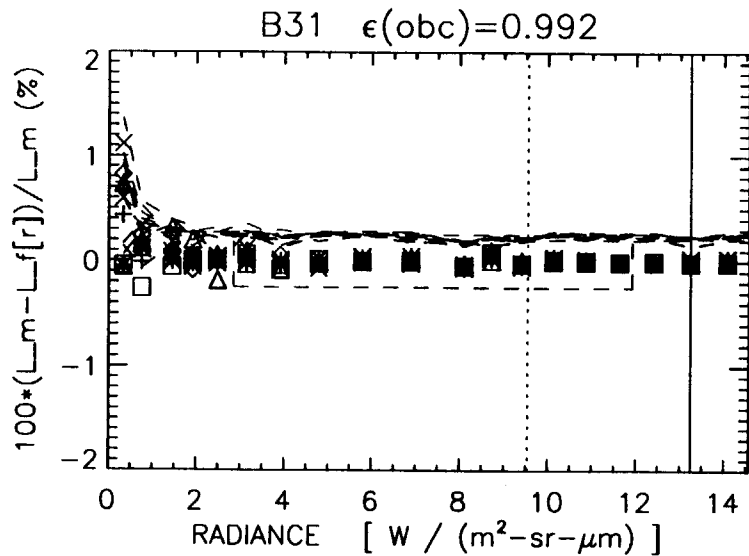
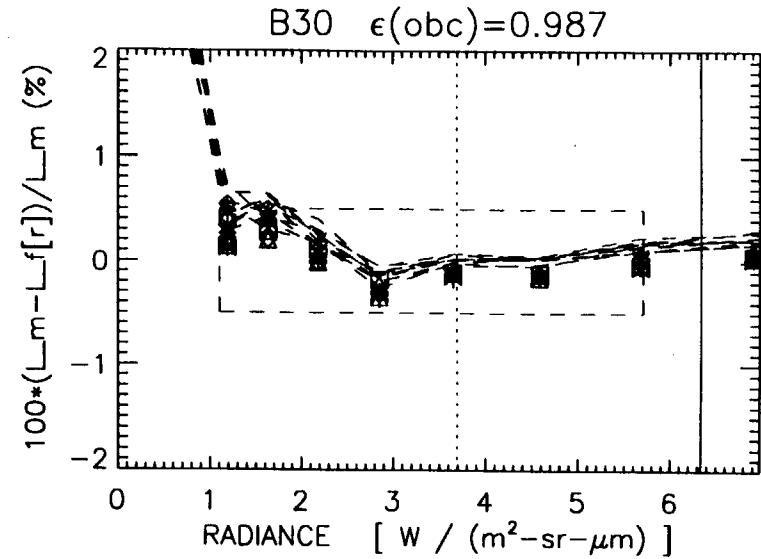
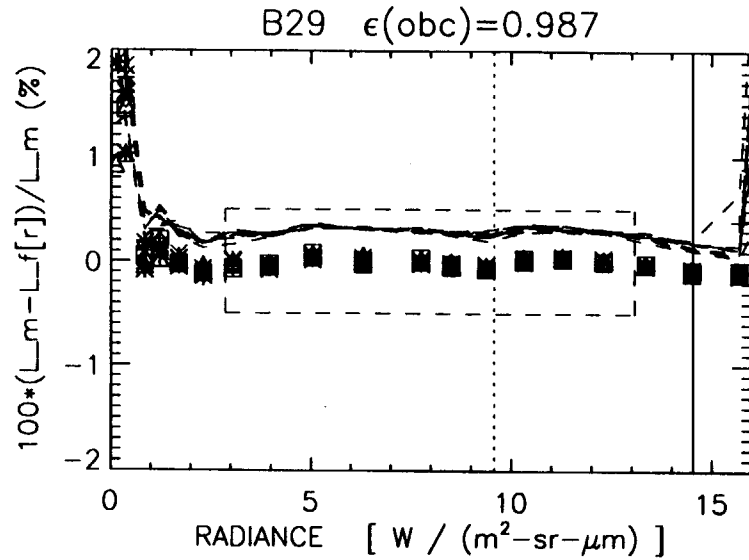
L1B Algorithm Demonstration; UAID: 1595-1618 (NOM2);  $T(\text{instr}) \sim T(\text{obc}) \sim 273$



Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*  
 Ltp: Green Dotted Line;    Lmax: Red Solid Line; Box  
 Dashed Line Box:  $(0.3L_{tp} - 0.9L_{max}) \times (\pm)1/2$  Goal\*

Ch5: Red ◇     $\Delta T(\text{bb}) = -0.34$  (K)  
 Ch10: Red Δ     $L_m$ : Measured Radiance  
                    $L_f$ : Fitting Radiance (symbols)  
                    $L_r$ : Retrieval Radinace (dashed lines)

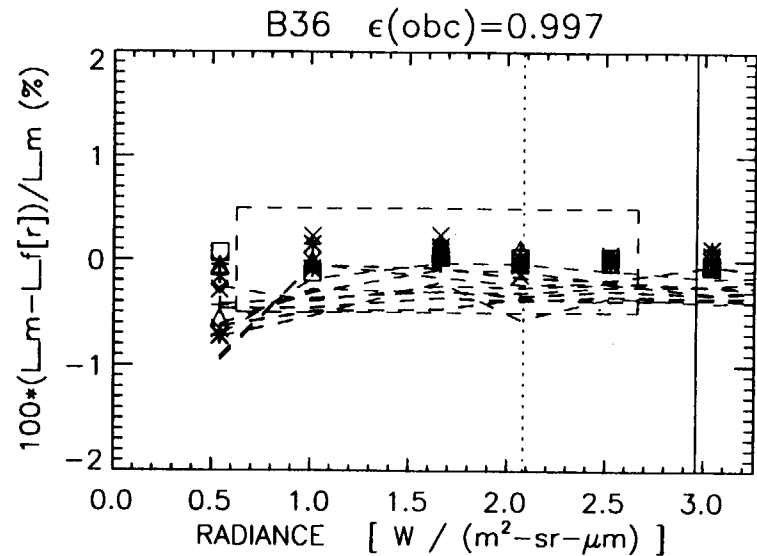
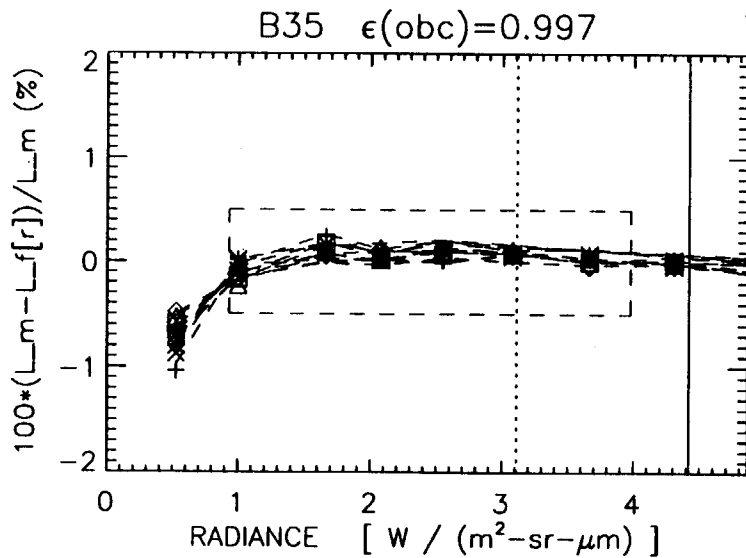
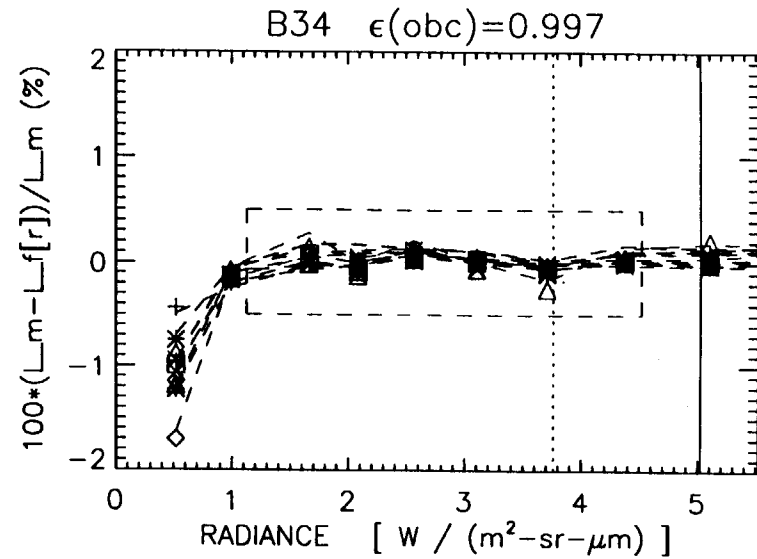
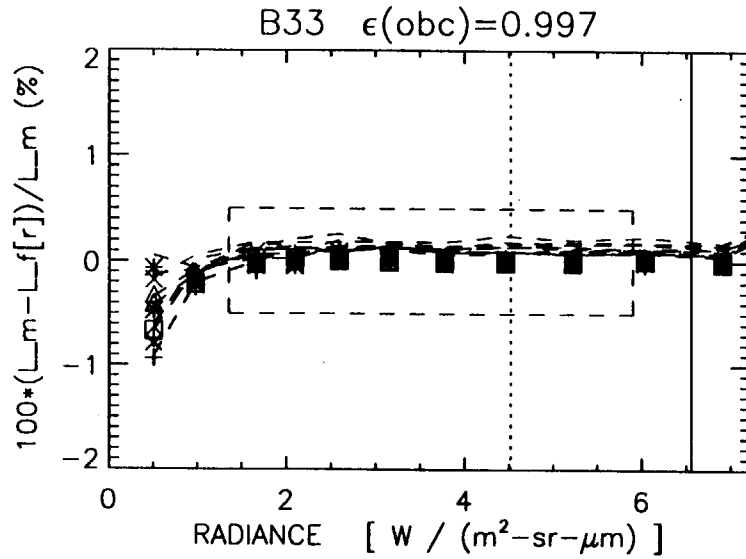
L1B Algorithm Demonstration; UAID: 1595-1618 (NOM2);  $T(\text{instr}) \sim T(\text{obc}) \sim 273$



Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*  
 Ltyp: Green Dotted Line;    Lmax: Red Solid Line; Box  
 Dashed Line Box:  $(0.3L_{\text{typ}} - 0.9L_{\text{max}}) \times (\pm)1/2$  Goal\*

Ch5: Red ◇     $\Delta T(\text{bb}) = -0.34$  (K)  
 Ch10: Red Δ     $L_m$ : Measured Radiance  
                    $L_f$ : Fitting Radiance (symbols)  
                    $L_r$ : Retrieval Radiance (dashed lines)

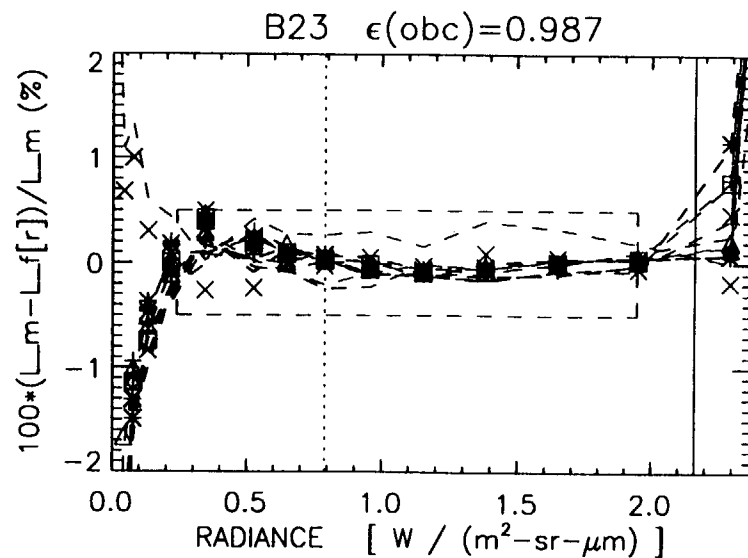
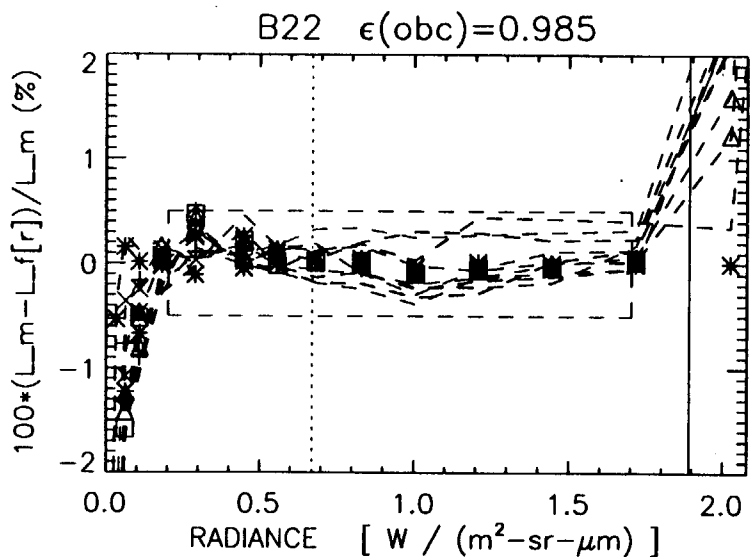
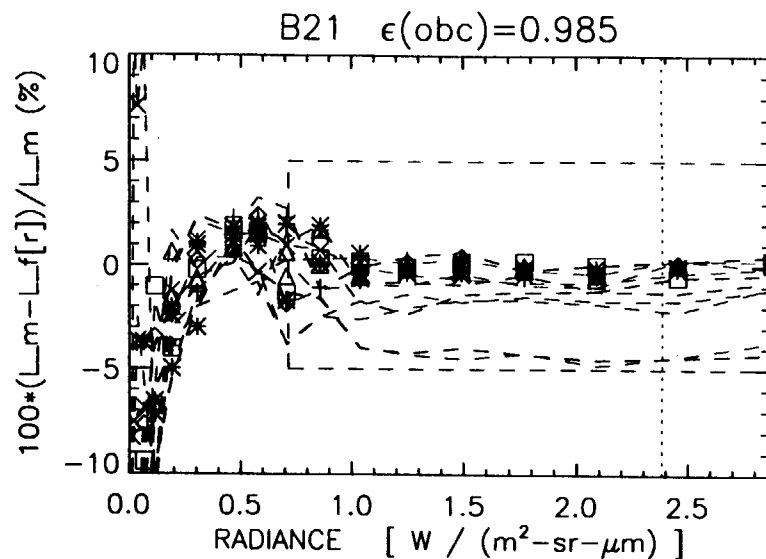
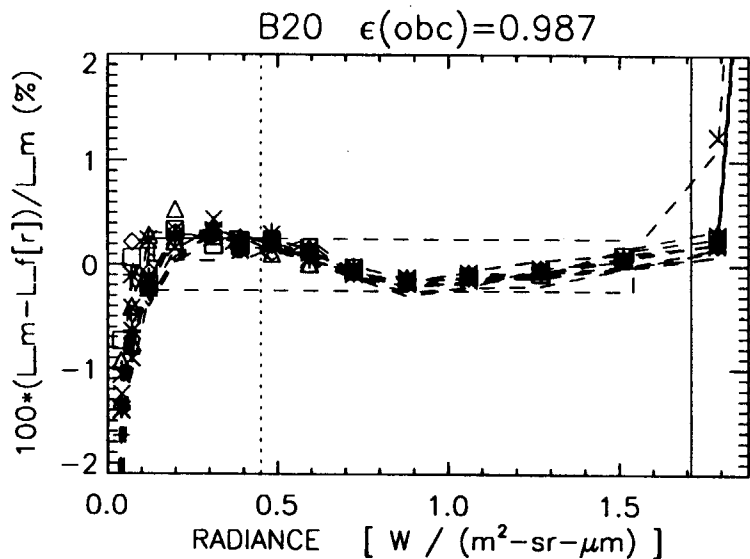
L1B Algorithm Demonstration; UAID: 1595-1618 (NOM2);  $T(\text{instr}) \sim T(\text{obc}) \sim 273$



Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*  
 Ltyp: Green Dotted Line;    Lmax: Red Solid Line; Box  
 Dashed Line Box:  $(0.3L_{\text{typ}} - 0.9L_{\text{max}}) \times (\pm)1/2 \text{ Goal}^*$

Ch5: Red ◇     $\Delta T(\text{bb}) = -0.34 \text{ (K)}$   
 Ch10: Red Δ     $L_m$ : Measured Radiance  
 $L_f$ : Fitting Radiance (symbols)  
 $L_r$ : Retrieval Radinace (dashed lines)

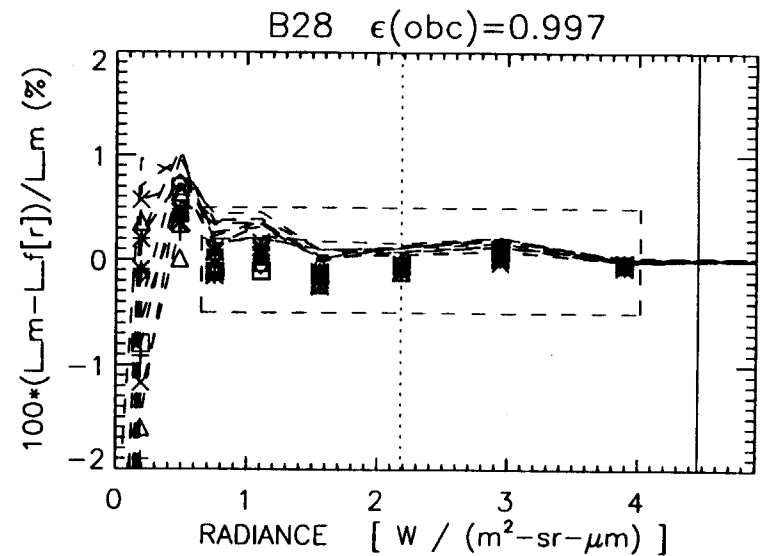
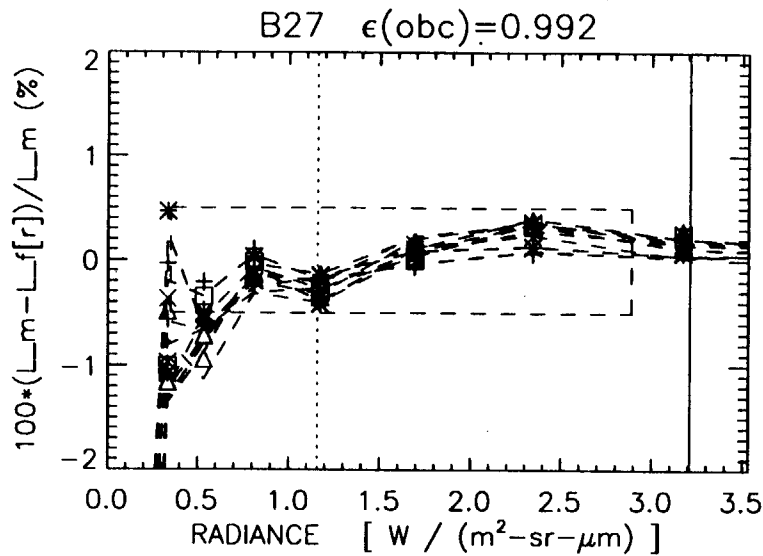
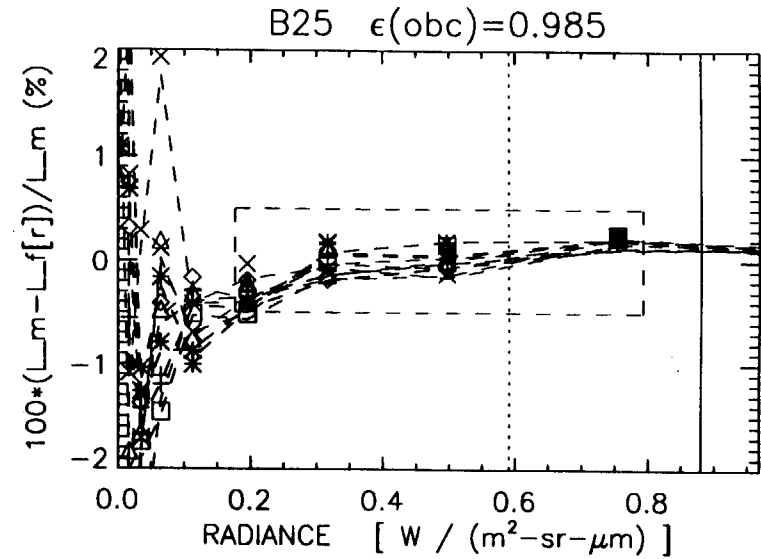
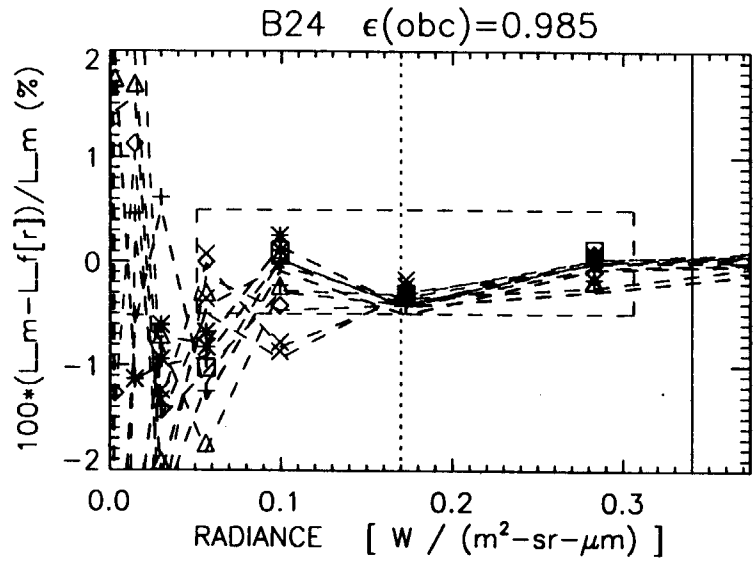
L1B Algorithm Demonstration; UAID: 1402-1426 (HOT);  $T(\text{instr}) \sim T(\text{obc}) \sim 283$



Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*  
 Ltyp: Green Dotted Line;    Lmax: Red Solid Line; Box  
 Dashed Line Box:  $(0.3L_{\text{typ}} - 0.9L_{\text{max}}) \times (\pm)1/2$  Goal\*

Ch5: Red ◇     $\Delta T(\text{bb}) = -0.19$  (K)  
 Ch10: Red Δ     $L_m$ : Measured Radiance  
 $L_f$ : Fitting Radiance (symbols)  
 $L_r$ : Retrieval Radiance (dashed lines)

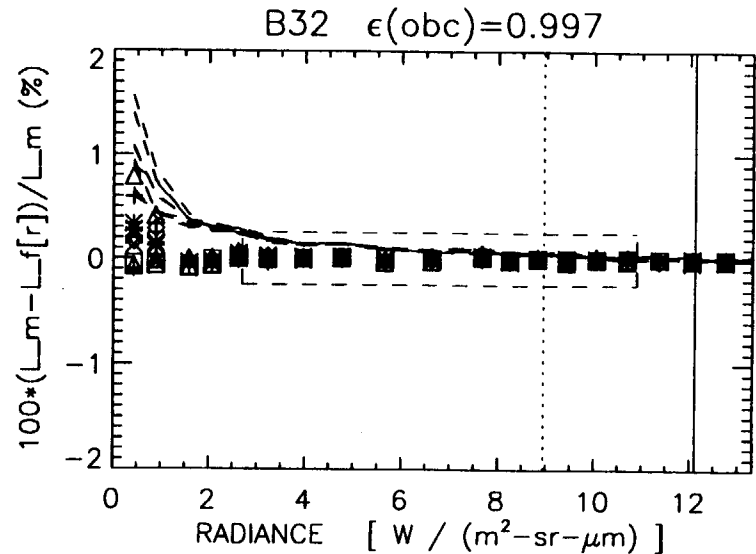
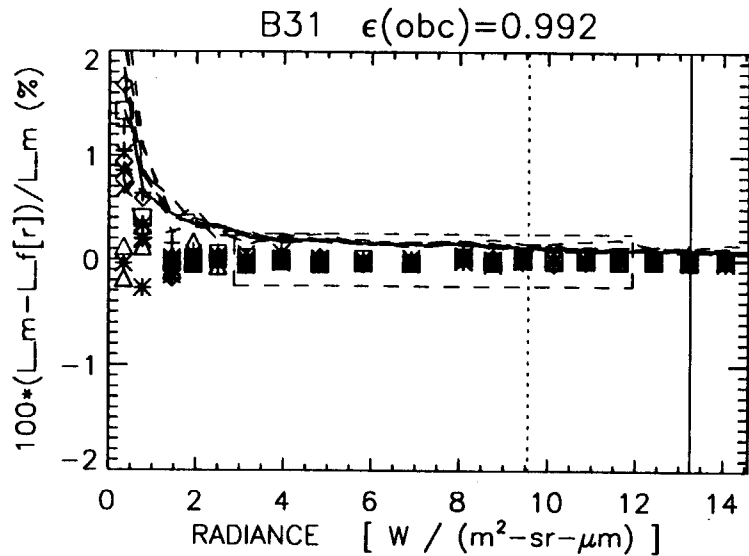
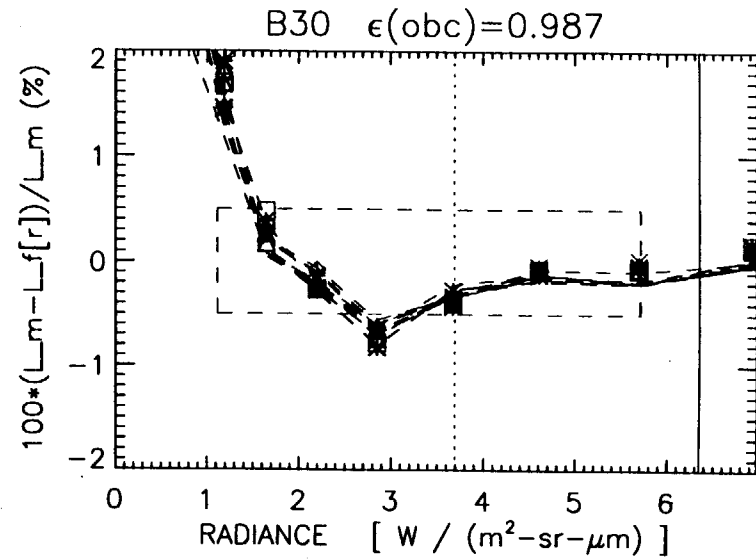
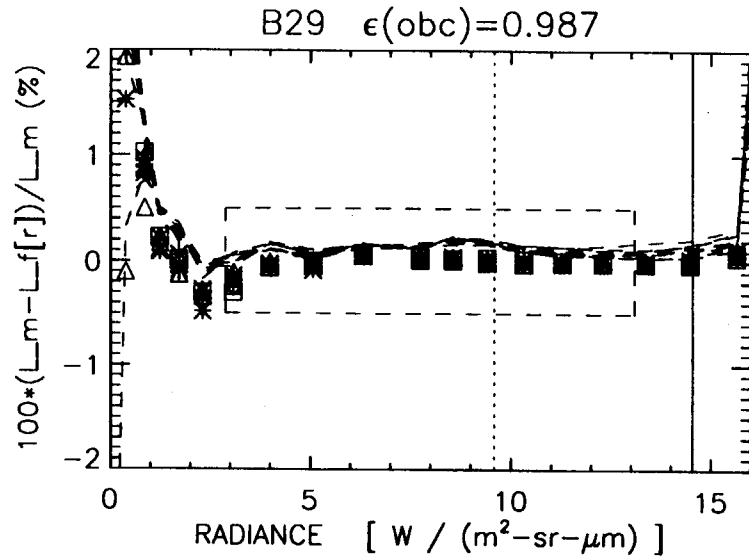
L1B Algorithm Demonstration; UAID: 1402-1426 (HOT);  $T(\text{instr}) \sim T(\text{obc}) \sim 283$



Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*  
 Ltyp: Green Dotted Line;    Lmax: Red Solid Line; Box  
 Dashed Line Box:  $(0.3L_{\text{typ}} - 0.9L_{\text{max}}) \times (\pm)1/2$  Goal\*

Ch5: Red ◇     $\Delta T(\text{bb}) = -0.19$  (K)  
 Ch10: Red Δ     $L_m$ : Measured Radiance  
                    $L_f$ : Fitting Radiance (symbols)  
                    $L_r$ : Retrieval Radiance (dashed lines)

L1B Algorithm Demonstration; UAID: 1402-1426 (HOT);  $T(\text{instr}) \sim T(\text{obc}) \sim 283$

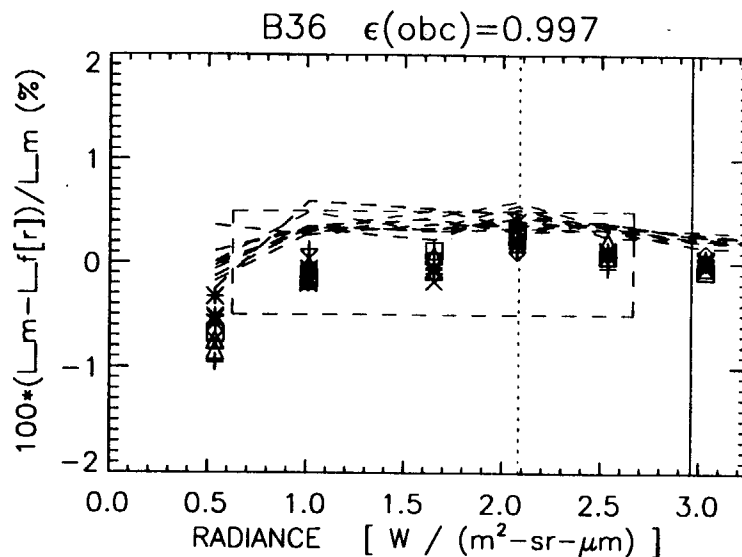
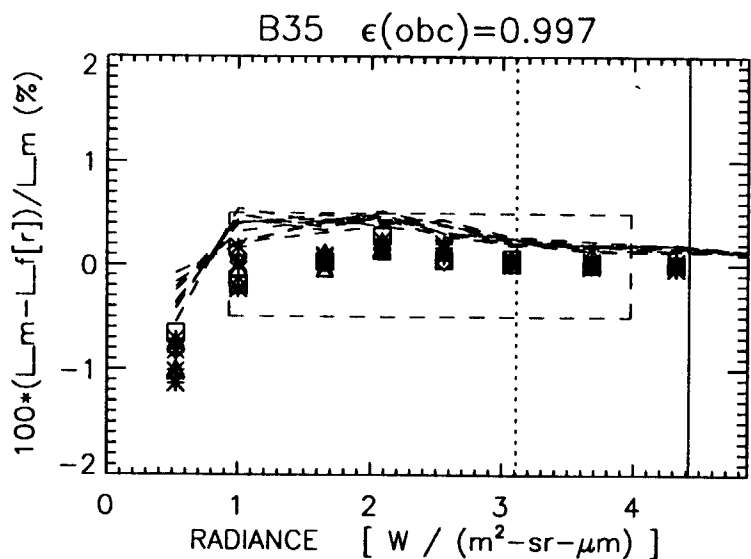
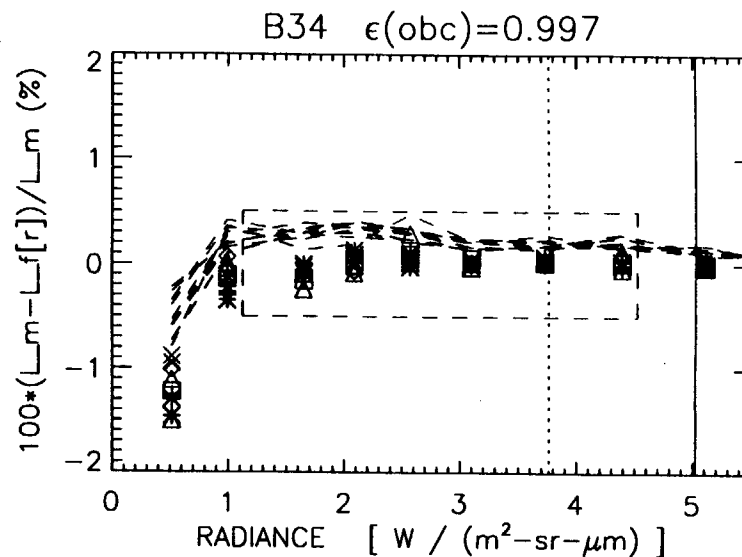
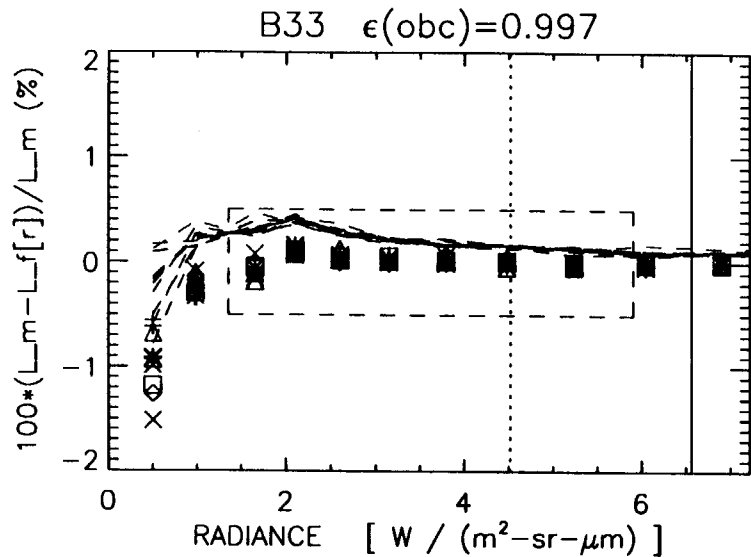


Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk  $\Delta$   
 Ch6: Grn  $\square$     Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*  
 Ltyp: Green Dotted Line;    Lmax: Red Solid Line; Box  
 Dashed Line Box:  $(0.3L_{\text{typ}} - 0.9L_{\text{max}}) \times (\pm)1/2$  Goal\*

Ch5: Red  $\diamond$      $\Delta T(\text{bb}) = -0.19$  (K)  
 Ch10: Red  $\Delta$      $L_m$ : Measured Radiance  
                    $L_f$ : Fitting Radiance (symbols)  
                    $L_r$ : Retrieval Radiance (dashed lines)



L1B Algorithm Demonstration; UAID: 1402-1426 (HOT);  $T(\text{instr}) \sim T(\text{obc}) \sim 283$



Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ  
 Ch5: Red ◇    Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*    Ch10: Red Δ  
 Ltyp: Green Dotted Line;    Lmax: Red Solid Line; Box  
 Dashed Line Box:  $(0.3L_{\text{typ}} - 0.9L_{\text{max}}) \times (\pm)1/2$  Goal\*

$\Delta T(\text{bb}) = -0.19$  (K)  
 $L_m$ : Measured Radiance  
 $L_f$ : Fitting Radiance (symbols)  
 $L_r$ : Retrieval Radiance (dashed lines)

# Short Term (4 days) Repeatability Assessment



# Radiance Uncertainty Equations



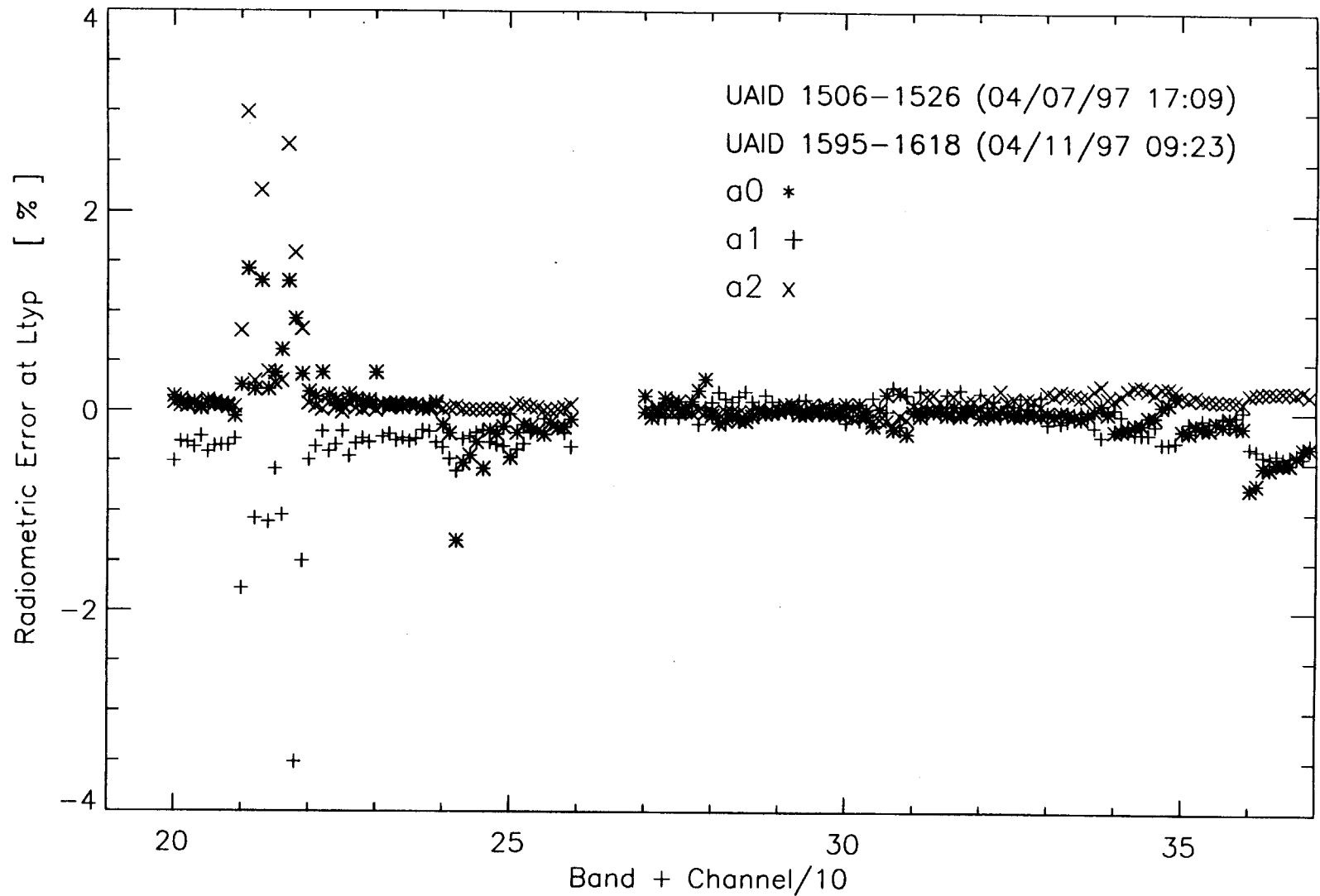
$$L = a_0 + a_1 * dn + a_2 * dn^2$$

$$\left. \frac{dL}{L} \right|_{a_0} = \frac{da_0}{L} \frac{a_0}{L}$$

$$\left. \frac{dL}{L} \right|_{a_1} = \frac{da_1}{L} * dn \frac{a_1}{\langle a_1 \rangle}$$

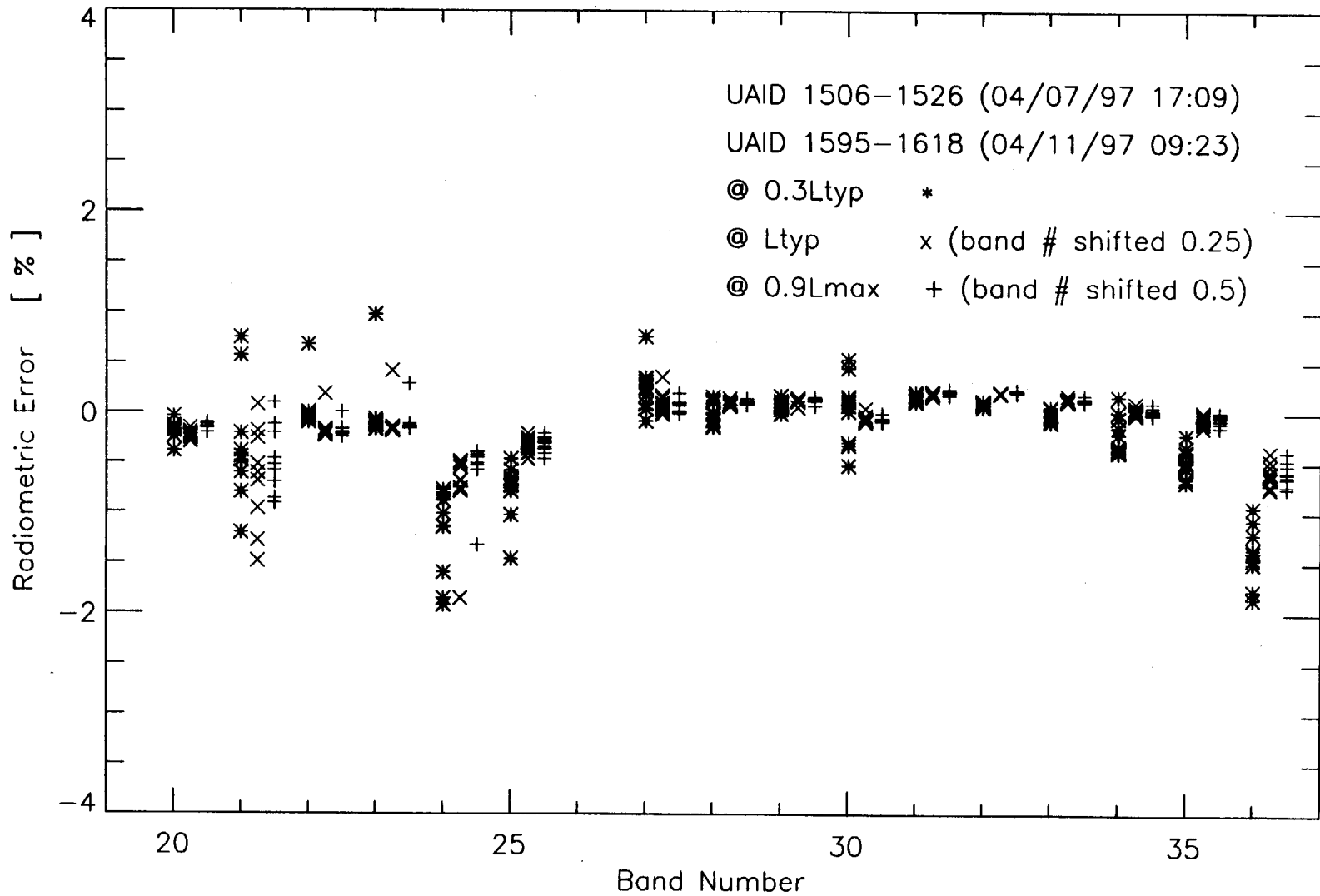
$$\left. \frac{dL}{L} \right|_{a_2} = \frac{da_2}{L} * dn^2 \frac{a_2}{\langle a_1 \rangle^2} * L$$

MODIS IR Bands/Channels Short Term Stability at Nominal Plateau (273K)  
Radiometric Error dL/L at Ltyp Due to Fitting Coefficient Error



Quadratic Fitting:  $L = a_0 + a_1dn + a_2dn^2$

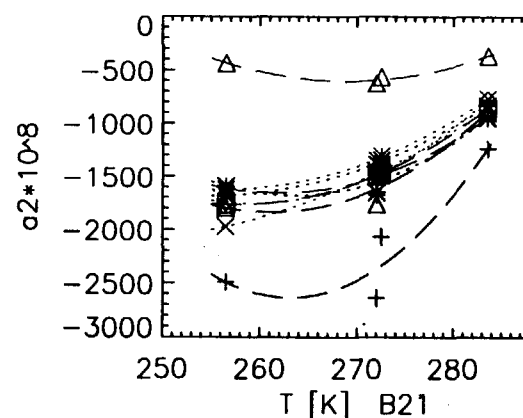
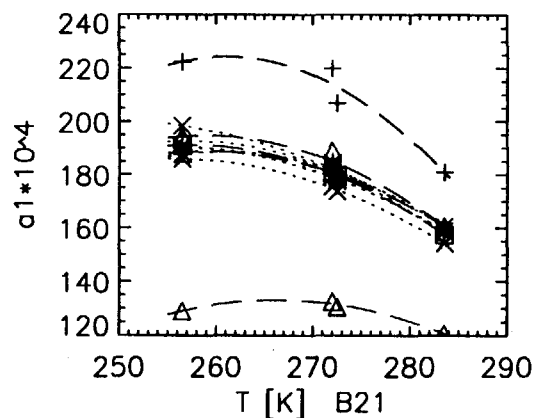
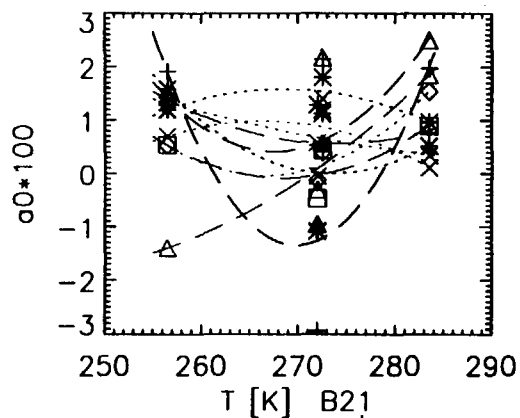
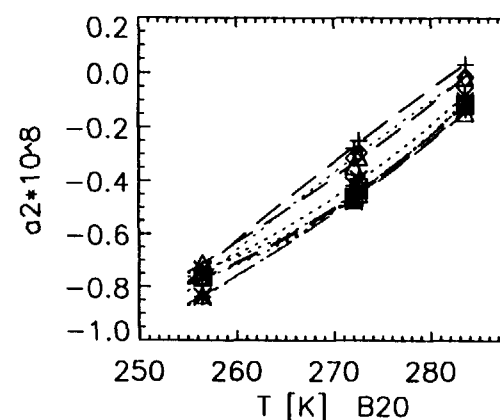
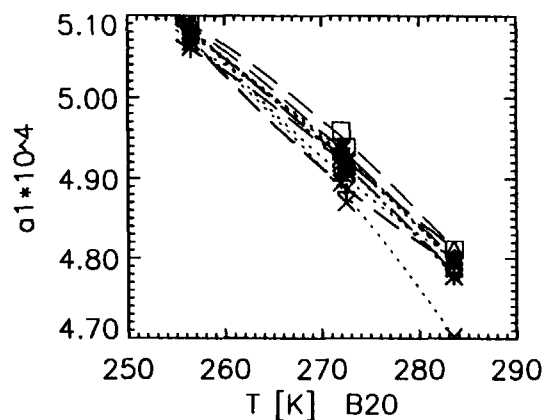
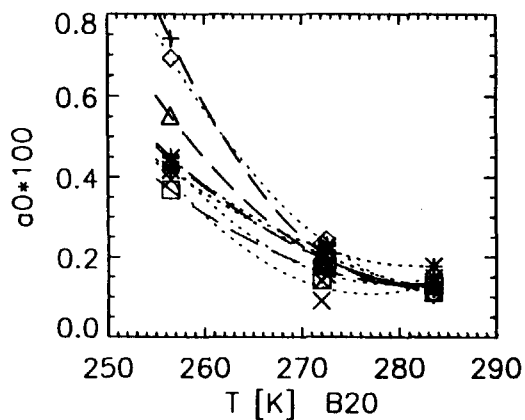
MODIS IR Bands/Channels Repeatability at Nominal Plateau (273K)  
 Radiometric Error  $dL/L = [L1\_f - L2\_f]/L1\_f$



Quadratic Fitting:  $L = a_0 + a_1dn + a_2dn^2$

# Calibration Coefficient Temperature Dependencies

# Preliminary Analysis of Calibration Coefficient Temperature Dependencies

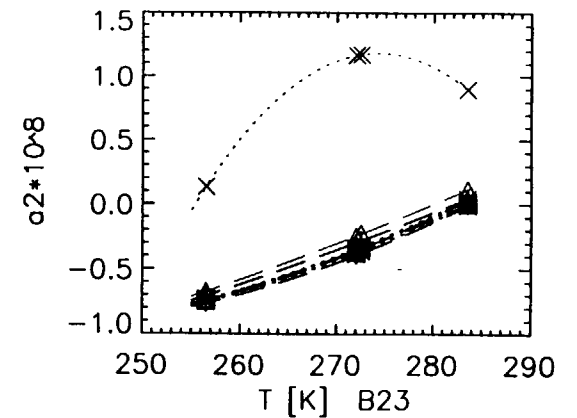
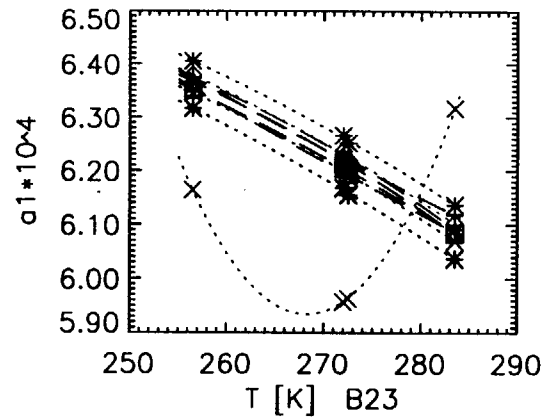
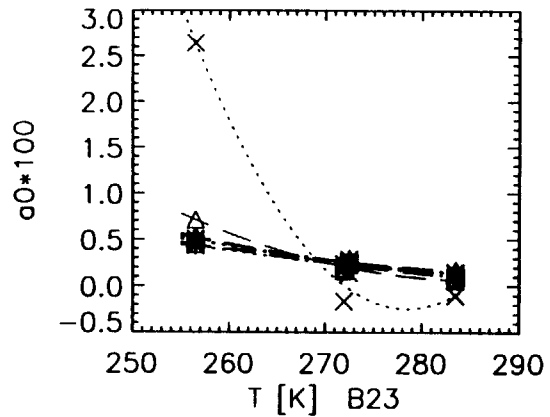
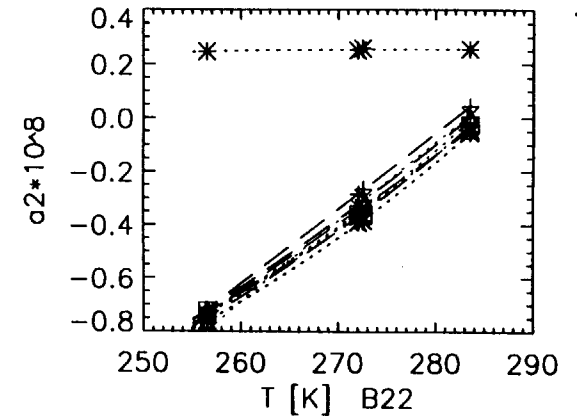
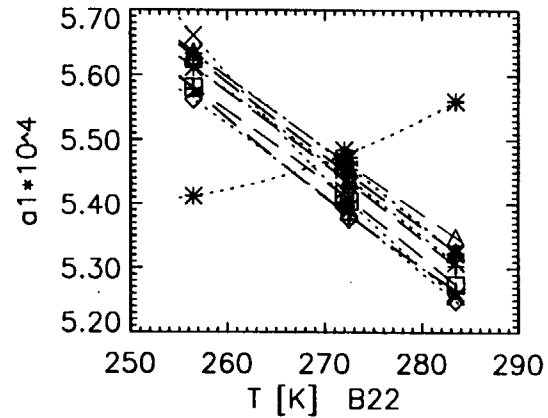
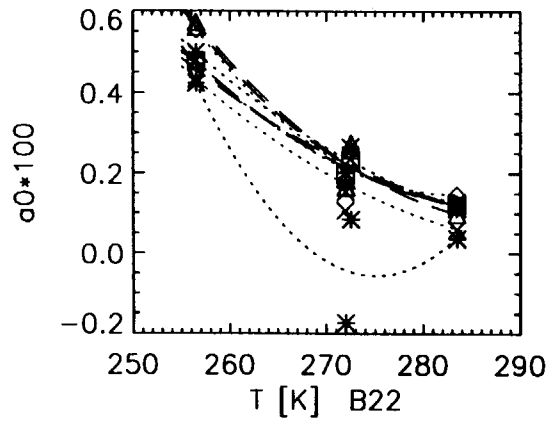


Ch1: Red x dotted line  
 Ch3: Blk \* dotted line  
 Ch5: Red  $\diamond$  dotted line  
 Ch7: Grn x dotted line  
 Ch9: Blu \* dotted line

Ch2: Blu + dashed line  
 Ch4: Blk  $\Delta$  dashed line  
 Ch6: Grn  $\square$  dashed line  
 Ch8: Grn + dashed line  
 Ch10: Red  $\Delta$  dashed line

UAID	Plateau
1315-1337	Cold (256)
1506-1526	Nom1 (273)
1595-1618	Nom2 (273)
1402-1426	Hot (283)

# Preliminary Analysis of Calibration Coefficient Temperature Dependencies



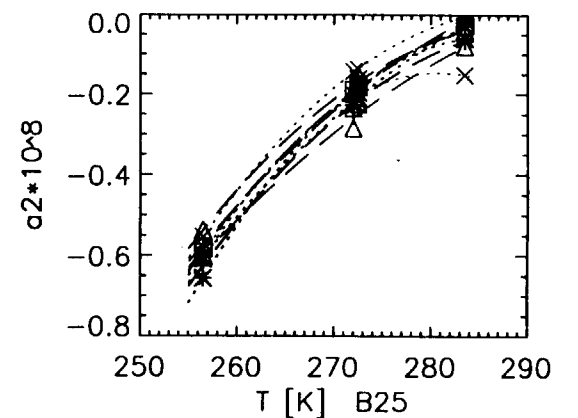
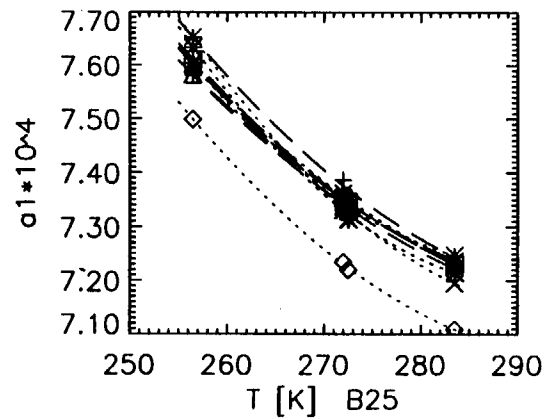
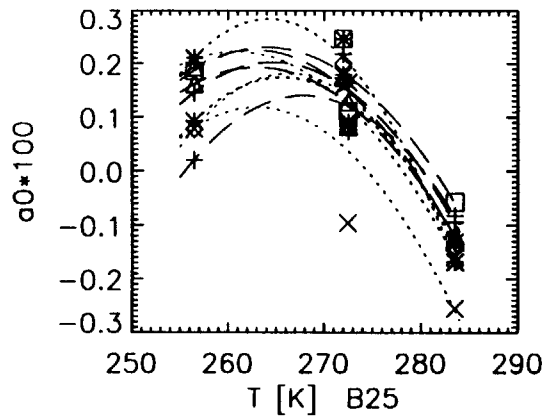
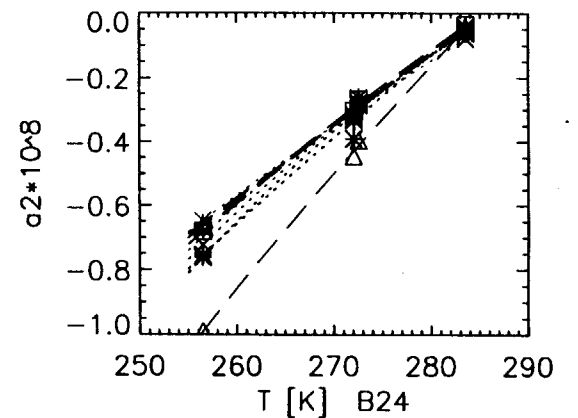
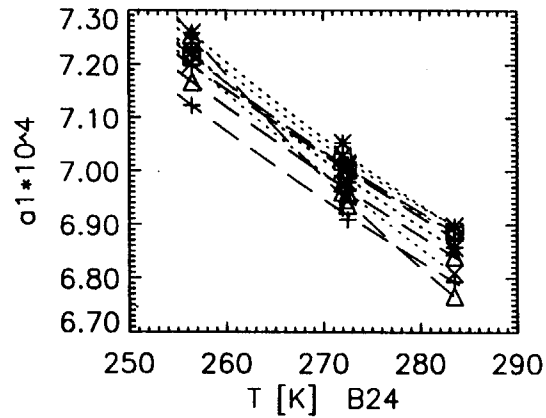
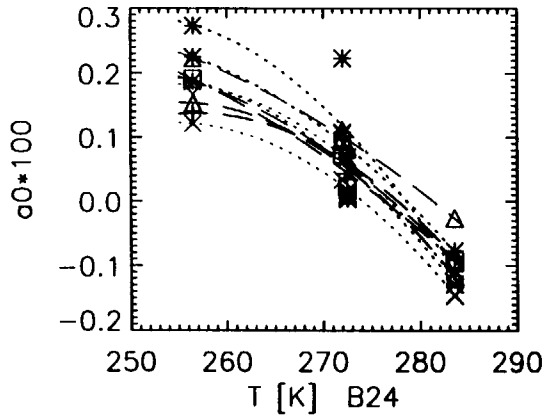
Ch1: Red x dotted line  
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 Ch5: Red  $\diamond$  dotted line  
 Ch7: Grn x dotted line  
 Ch9: Blu \* dotted line

Ch2: Blu + dashed line  
 Ch4: Blk  $\Delta$  dashed line  
 Ch6: Grn  $\square$  dashed line  
 Ch8: Grn + dashed line  
 Ch10: Red  $\Delta$  dashed line

UAID	Plateau
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# Preliminary Analysis of Calibration Coefficient Temperature Dependencies

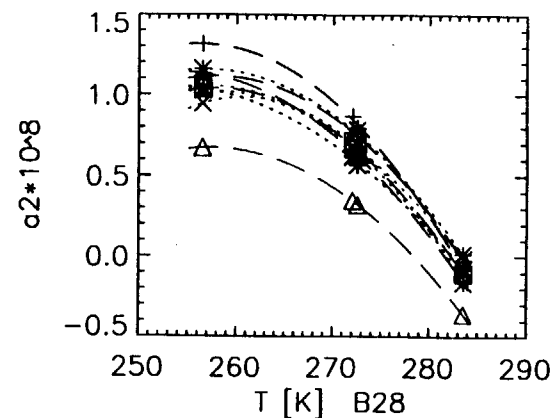
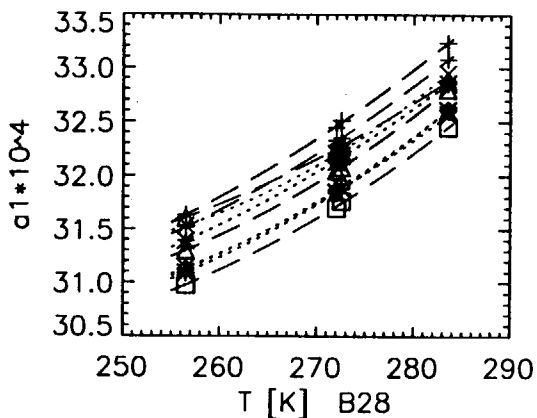
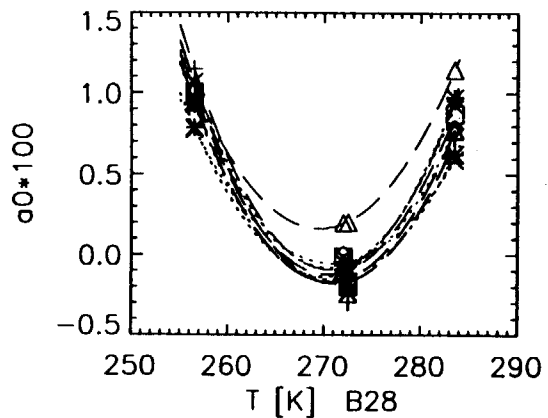
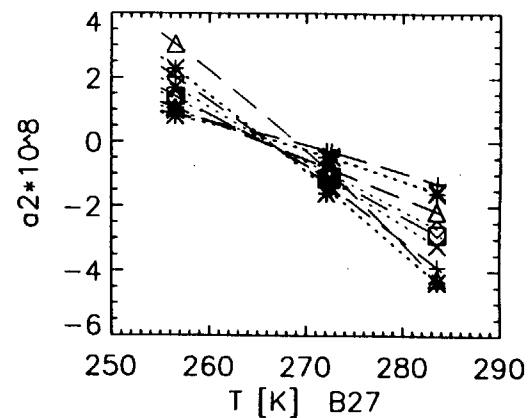
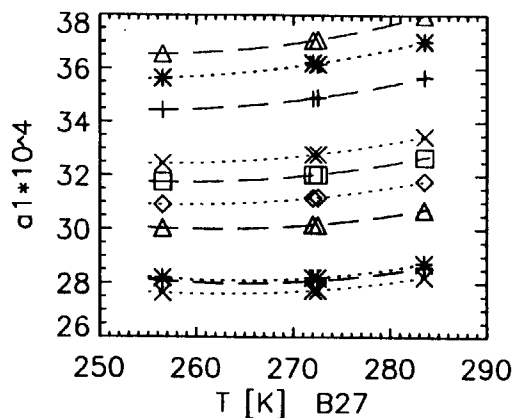
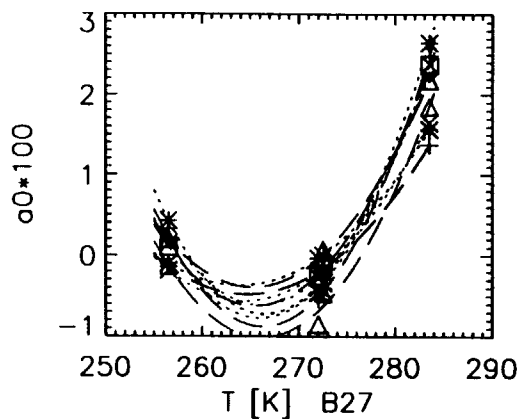


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UAID	Plateau
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# Preliminary Analysis of Calibration Coefficient Temperature Dependencies

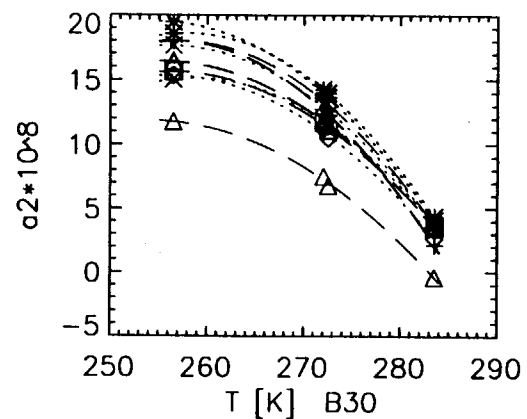
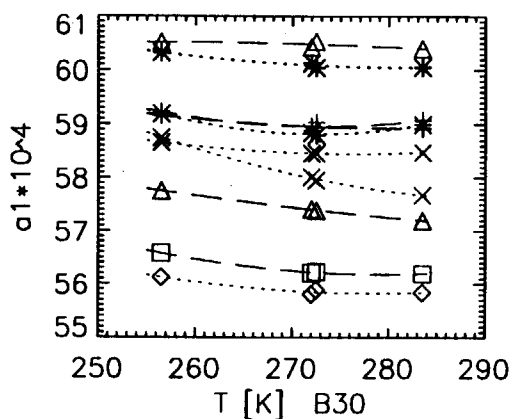
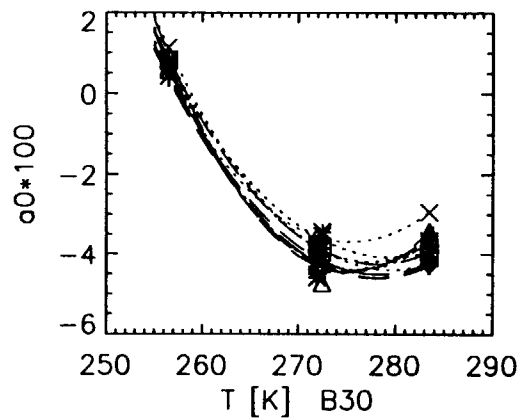
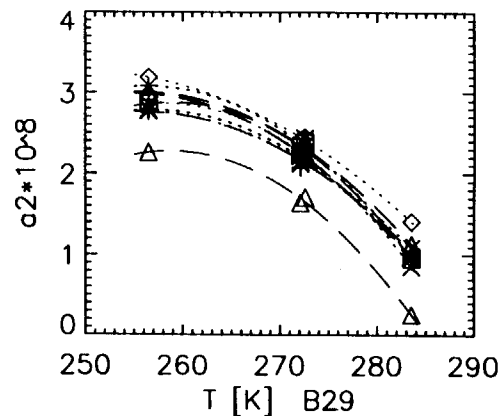
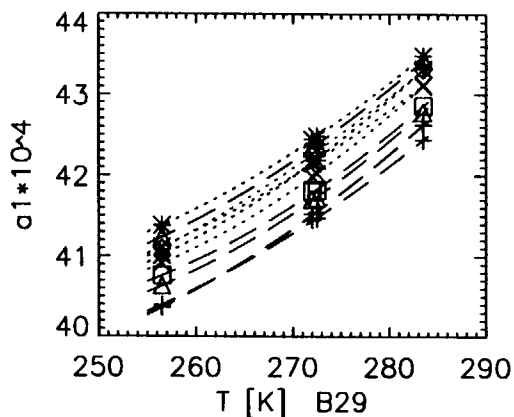
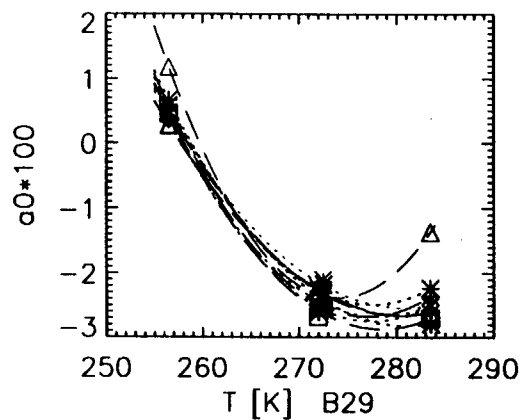


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# Preliminary Analysis of Calibration Coefficient Temperature Dependencies

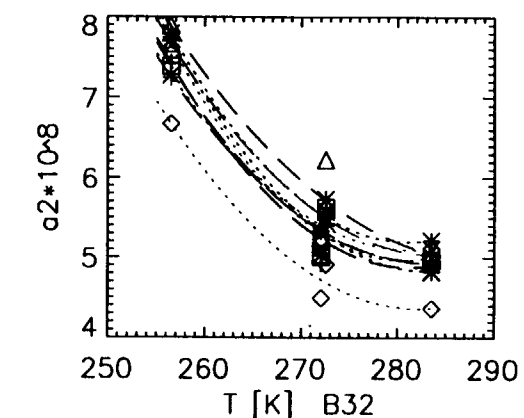
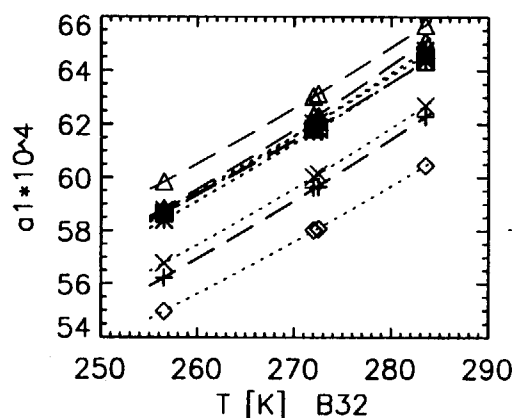
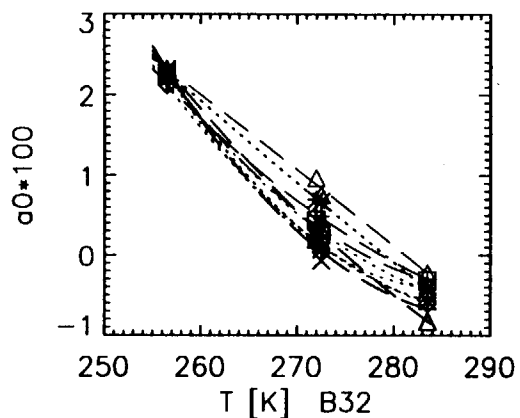
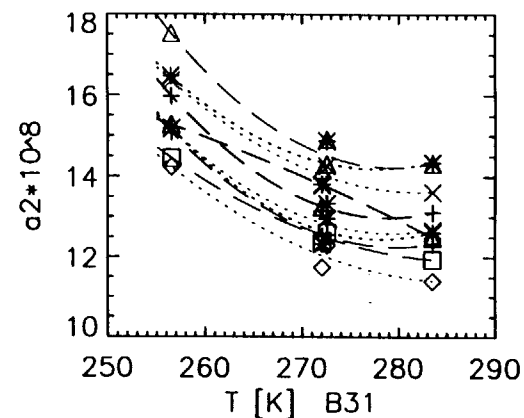
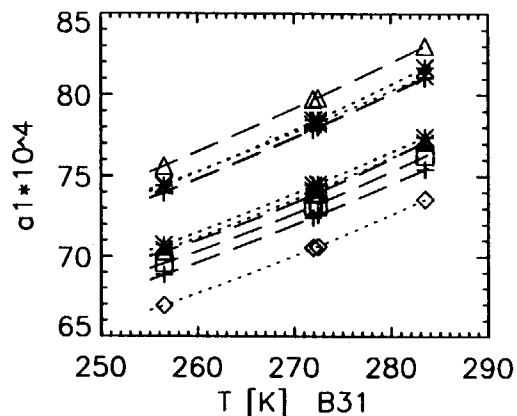
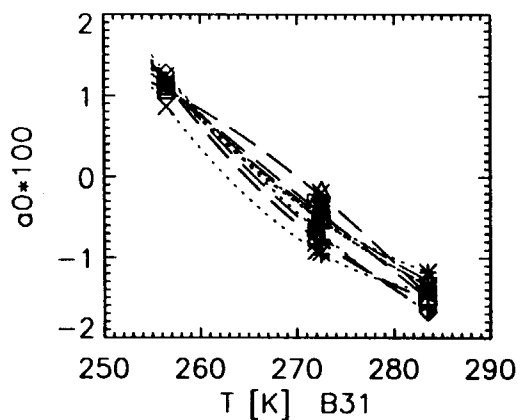


Ch1: Red x dotted line  
 Ch3: Blk \* dotted line  
 Ch5: Red  $\diamond$  dotted line  
 Ch7: Grn x dotted line  
 Ch9: Blu \* dotted line

Ch2: Blu + dashed line  
 Ch4: Blk  $\Delta$  dashed line  
 Ch6: Grn  $\square$  dashed line  
 Ch8: Grn + dashed line  
 Ch10: Red  $\Delta$  dashed line

UAID	Plateau
1315-1337	Cold (256)
1506-1526	Nom1 (273)
1595-1618	Nom2 (273)
1402-1426	Hot (283)

# Preliminary Analysis of Calibration Coefficient Temperature Dependencies



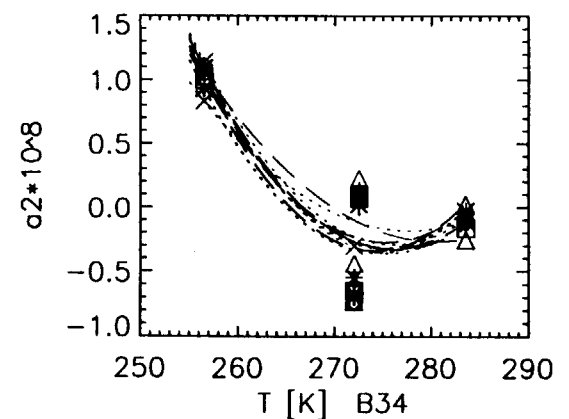
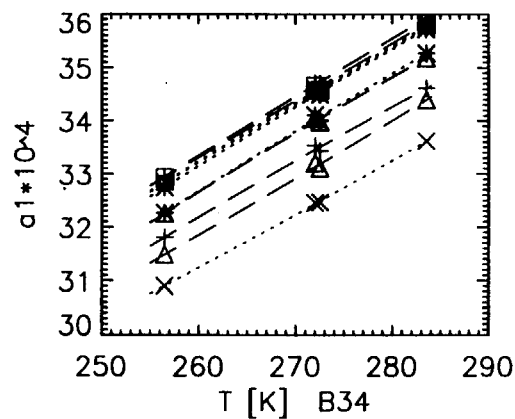
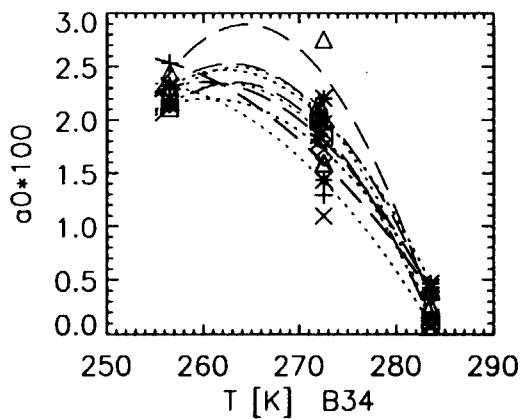
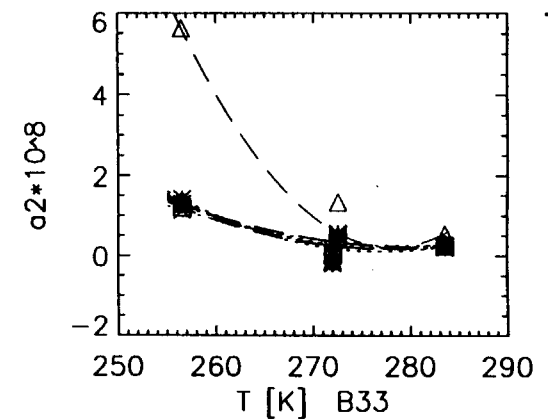
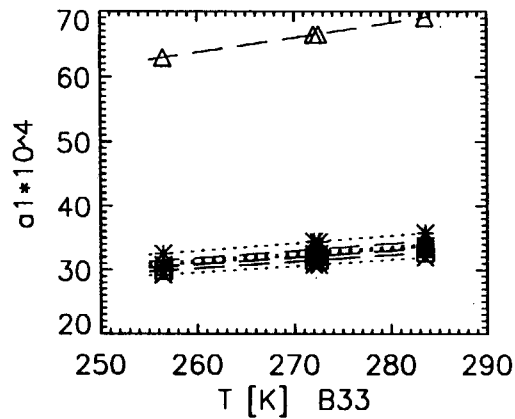
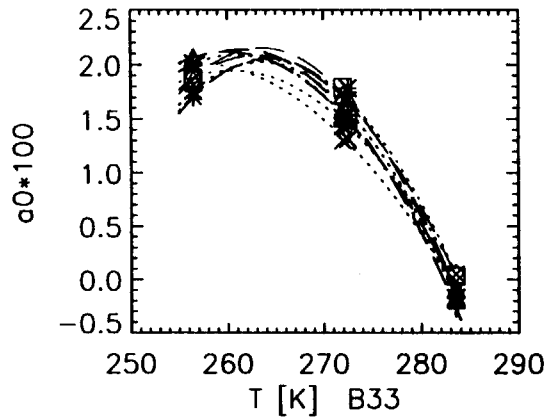
Ch1: Red x dotted line  
 Ch3: Blk \* dotted line  
 Ch5: Red  $\diamond$  dotted line  
 Ch7: Grn x dotted line  
 Ch9: Blu \* dotted line

Ch2: Blu + dashed line  
 Ch4: Blk  $\Delta$  dashed line  
 Ch6: Grn  $\square$  dashed line  
 Ch8: Grn + dashed line  
 Ch10: Red  $\Delta$  dashed line

UAID  
 1315-1337  
 1506-1526  
 1595-1618  
 1402-1426

Plateau  
 Cold (256)  
 Nom1 (273)  
 Nom2 (273)  
 Hot (283)

# Preliminary Analysis of Calibration Coefficient Temperature Dependencies

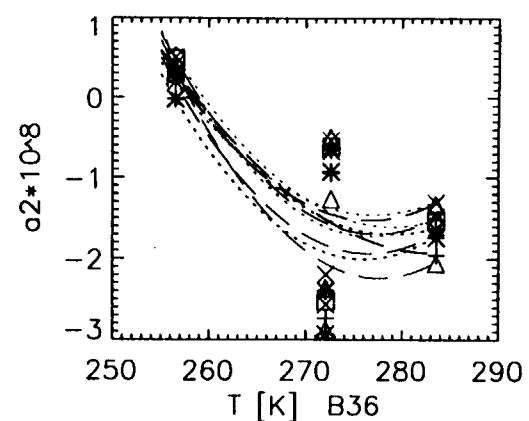
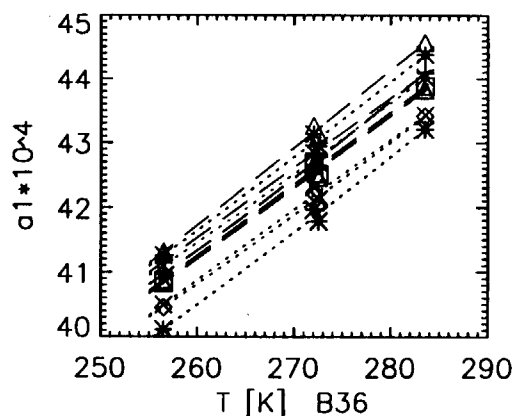
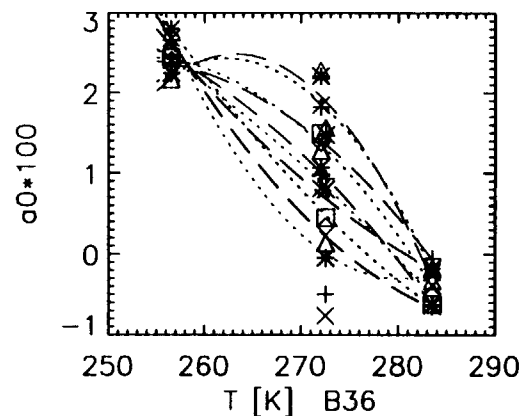
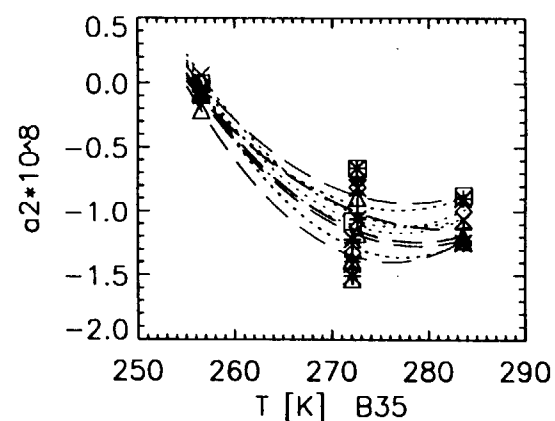
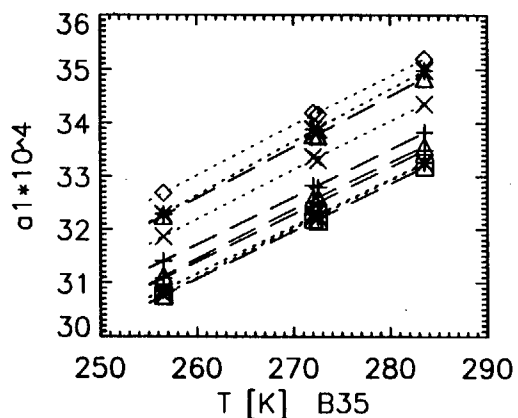
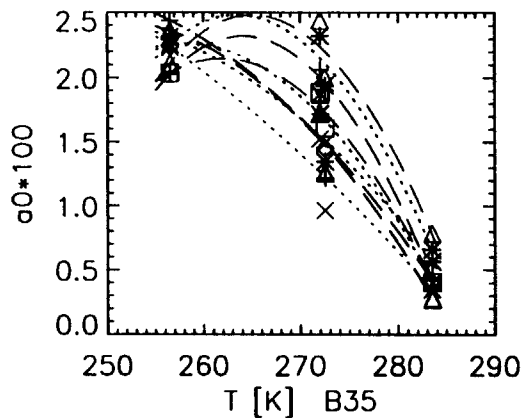


Ch1: Red x dotted line  
 Ch3: Blk \* dotted line  
 Ch5: Red  $\diamond$  dotted line  
 Ch7: Grn x dotted line  
 Ch9: Blu \* dotted line

Ch2: Blu + dashed line  
 Ch4: Blk  $\Delta$  dashed line  
 Ch6: Grn  $\square$  dashed line  
 Ch8: Grn + dashed line  
 Ch10: Red  $\Delta$  dashed line

UAID	Plateau
1315-1337	Cold (256)
1506-1526	Nom1 (273)
1595-1618	Nom2 (273)
1402-1426	Hot (283)

# Preliminary Analysis of Calibration Coefficient Temperature Dependencies



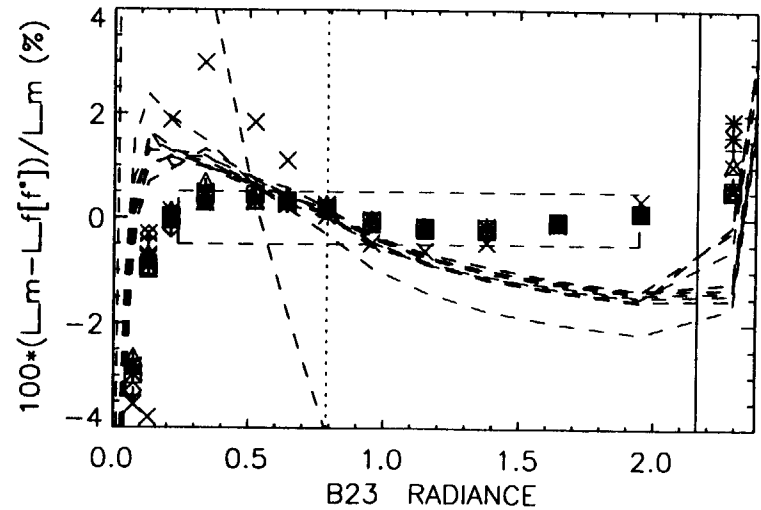
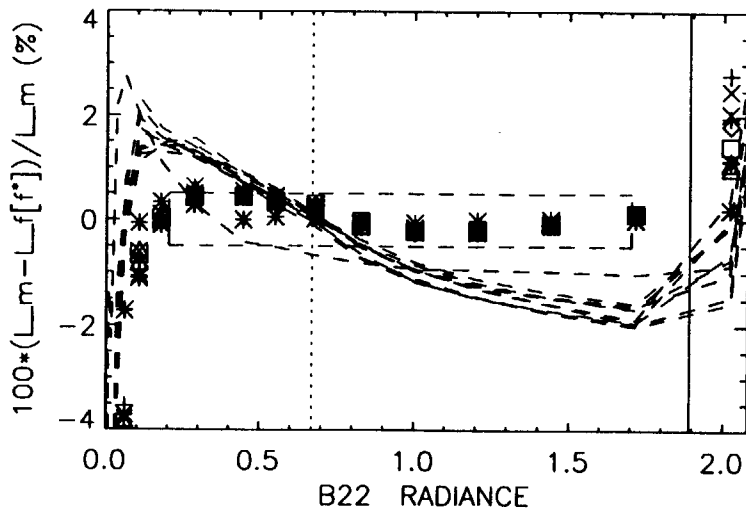
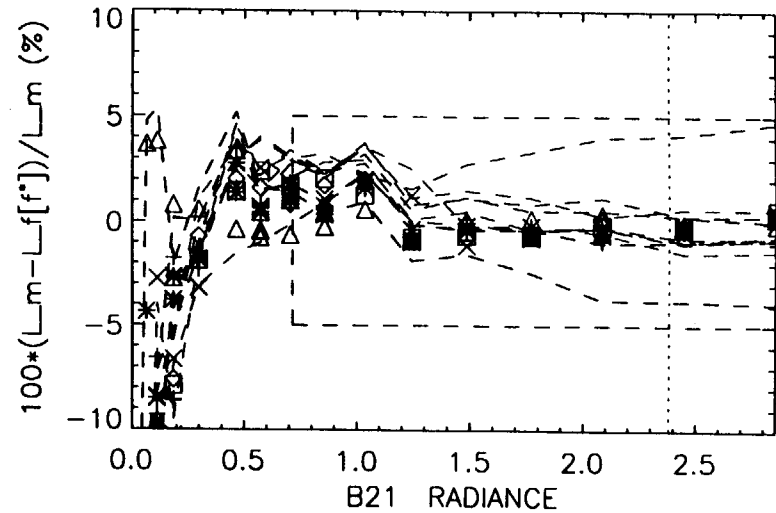
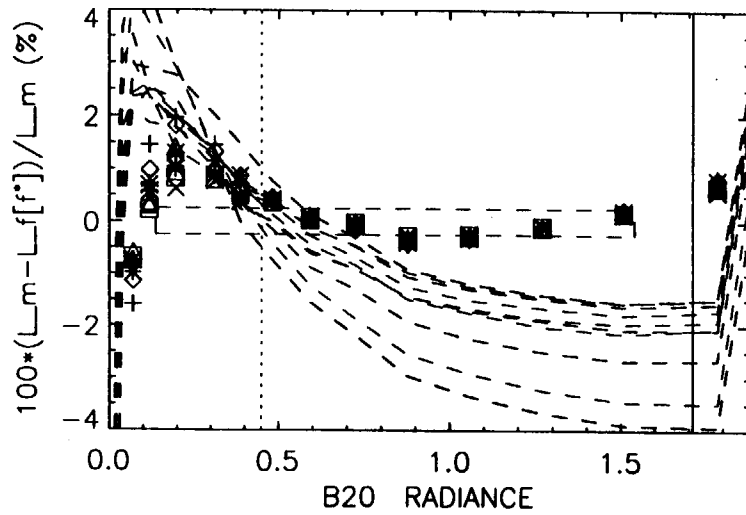
Ch1: Red x dotted line  
 Ch3: Blk \* dotted line  
 Ch5: Red  $\diamond$  dotted line  
 Ch7: Grn x dotted line  
 Ch9: Blu \* dotted line

Ch2: Blu + dashed line  
 Ch4: Blk  $\Delta$  dashed line  
 Ch6: Grn  $\square$  dashed line  
 Ch8: Grn + dashed line  
 Ch10: Red  $\Delta$  dashed line

UAID	Plateau
1315-1337	Cold (256)
1506-1526	Nom1 (273)
1595-1618	Nom2 (273)
1402-1426	Hot (283)

# Demonstration of Using Temperature Dependent Fitting Coefficients

UAID: 1315-1337 (COLD); T(instr)~256

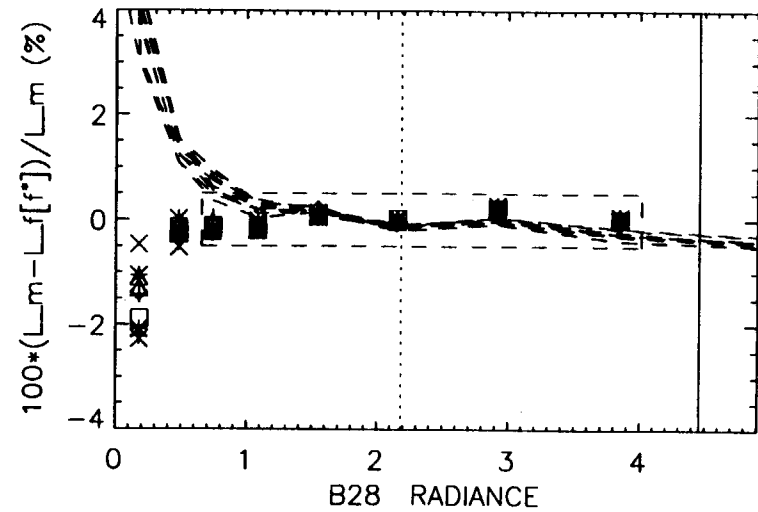
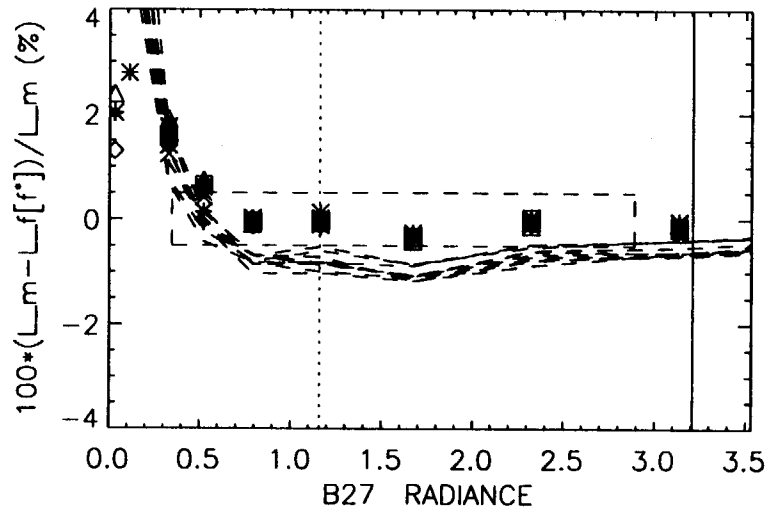
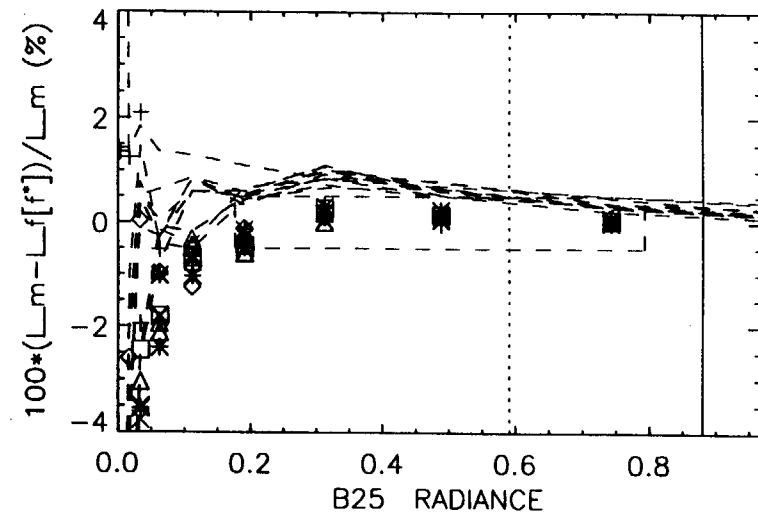
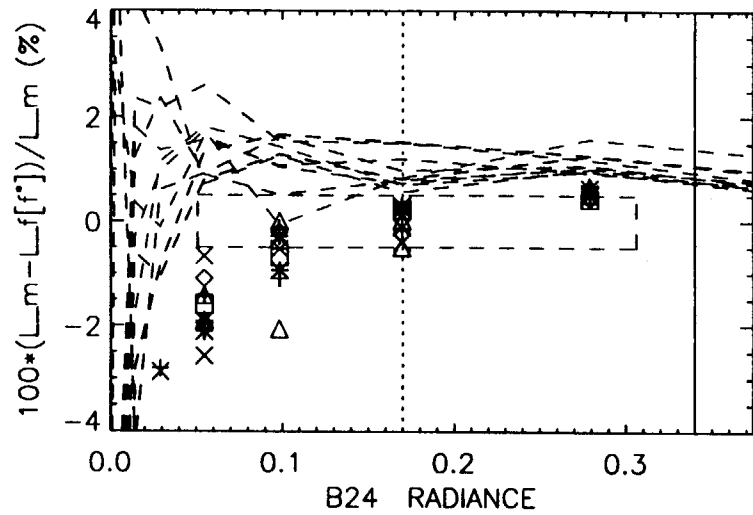


Ch1: Red x   Ch2: Blu +   Ch3: Blk \*   Ch4: Blk Δ   Ch5: Red ◇  
 Ch6: Grn □   Ch7: Grn x   Ch8: Grn +   Ch9: Blu \*   Ch10: Red Δ  
 Ltyp: Green Dotted Line;   Lmax: Red Solid Line; Box  
 Dashed Line Box:  $(0.3L_{typ} - 0.9L_{max}) \times (\pm)1/2$  Goal\*

Radiance:  $[W / (m^2-sr-\mu m)]$   
 $L_m$ : Measured Radiance  
 $L_f$ : Fitting Rad. (symbols)  
 $L_f^*$ :  $L_f$  with fixed  $a_0^{nom}$ ,  $a_2^{nom}$  (dashed lines)

# Demonstration of Using Temperature Dependent Fitting Coefficients

UAID: 1315-1337 (COLD);  $T(\text{instr}) \sim 256$



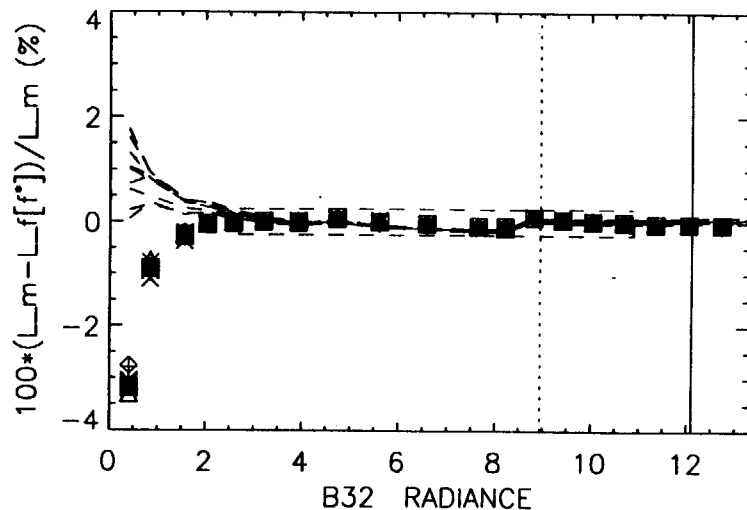
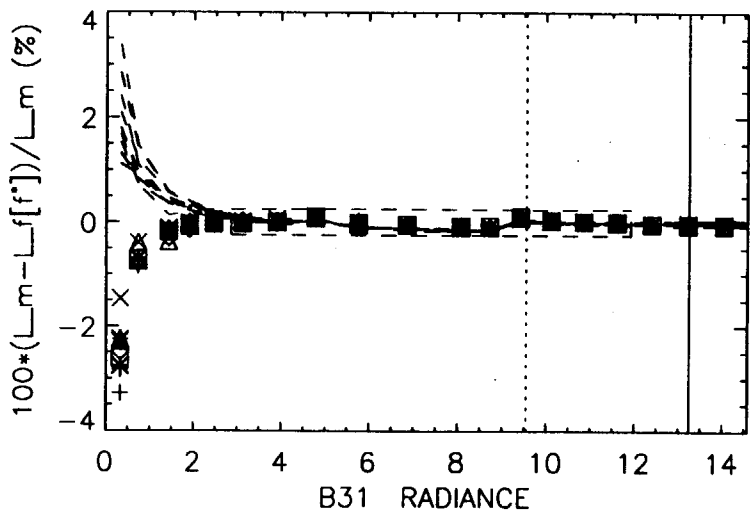
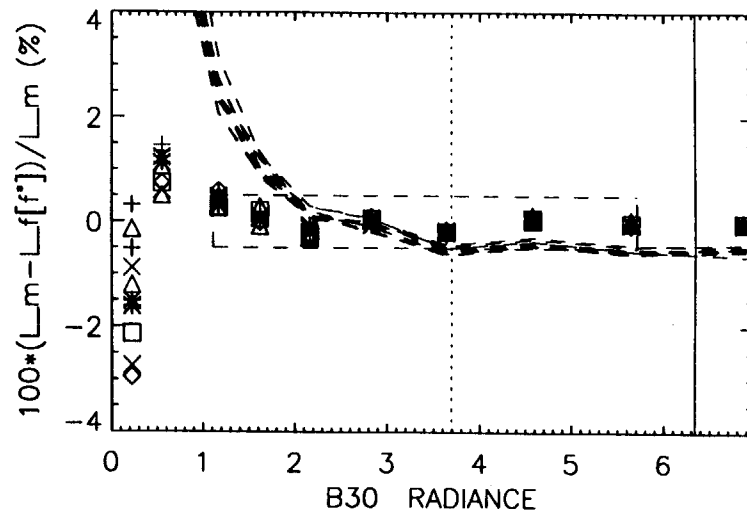
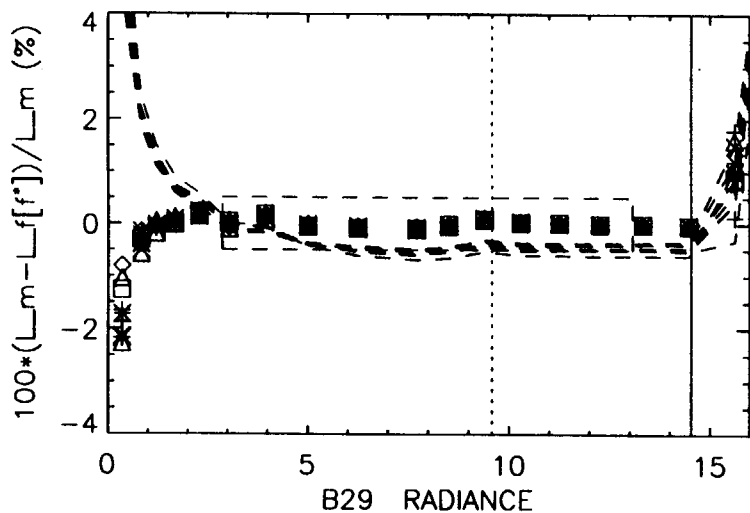
Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ    Ch5: Red ◇  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*    Ch10: Red Δ  
 Ltyp: Green Dotted Line;    Lmax: Red Solid Line; Box  
 Dashed Line Box:  $(0.3L_{\text{typ}} - 0.9L_{\text{max}}) \times (\pm)1/2 \text{ Goal}^*$

Radiance:  $[W / (m^2-sr-\mu m)]$   
 $L_m$ : Measured Radiance  
 $L_f$ : Fitting Rad. (symbols)  
 $L_f^*$ :  $L_f$  with fixed  $a_0^{\text{nom}}$ ,  $a_2^{\text{nom}}$  (dashed lines)



# Demonstration of Using Temperature Dependent Fitting Coefficients

UAID: 1315-1337 (COLD); T(instr)~256

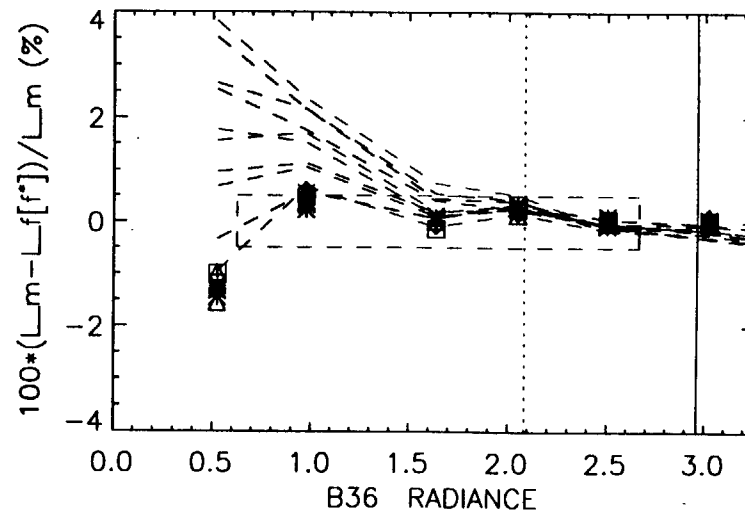
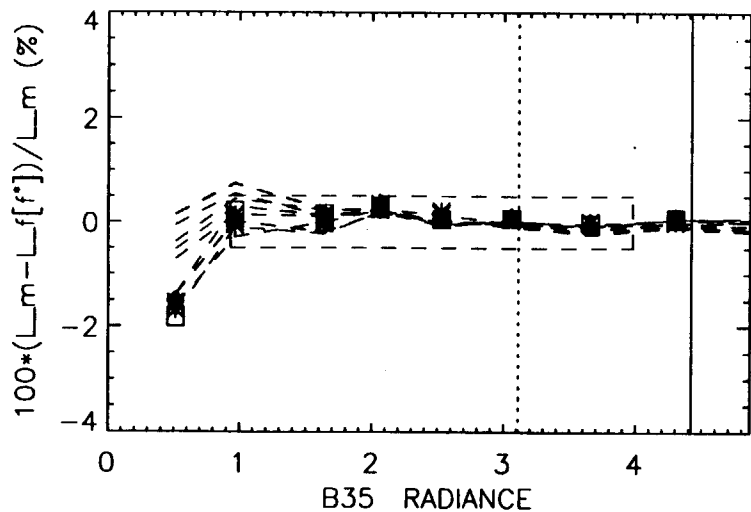
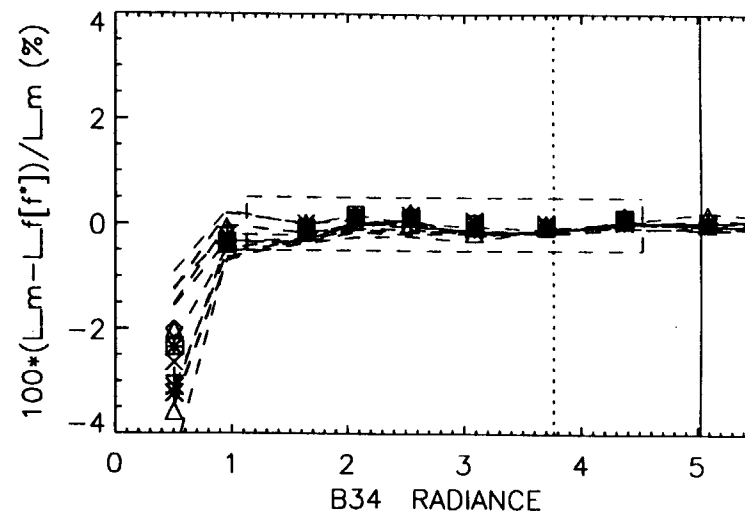
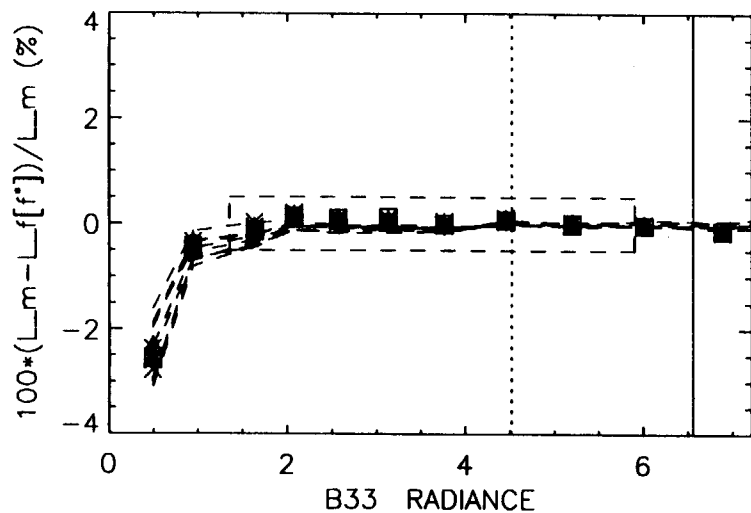


Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp: Green Dotted Line; Lmax: Red Solid Line; Box  
 Dashed Line Box:  $(0.3L_{typ} - 0.9L_{max}) \times (\pm)1/2$  Goal\*

Radiance:  $[W / (m^2-sr-\mu m)]$   
 $L_m$ : Measured Radiance  
 $L_f$ : Fitting Rad. (symbols)  
 $L_f^*$ :  $L_f$  with fixed  $a_0^{nom}$ ,  $a_2^{nom}$  (dashed lines)

# Demonstration of Using Temperature Dependent Fitting Coefficients

UAID: 1315-1337 (COLD);  $T(\text{instr}) \sim 256$

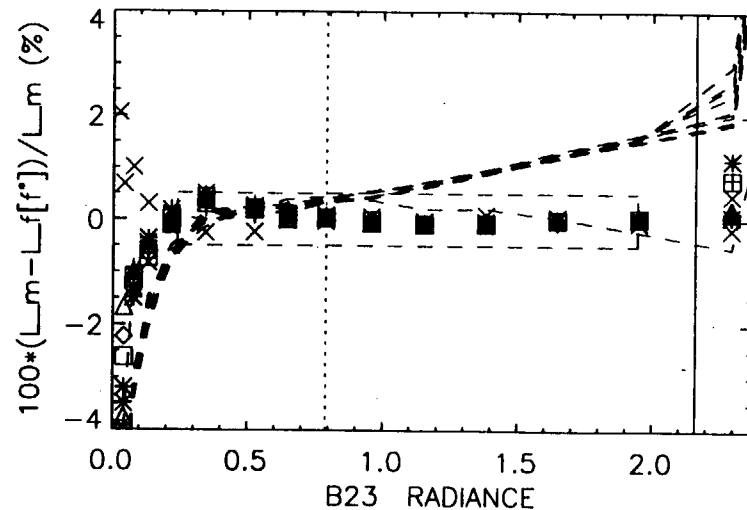
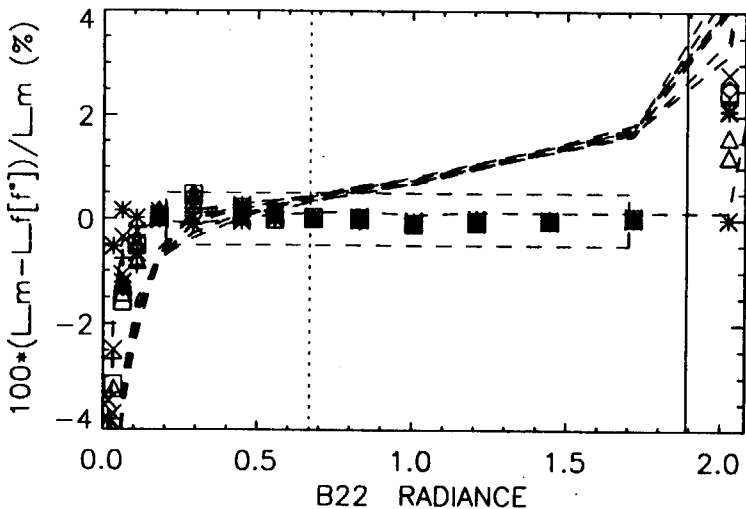
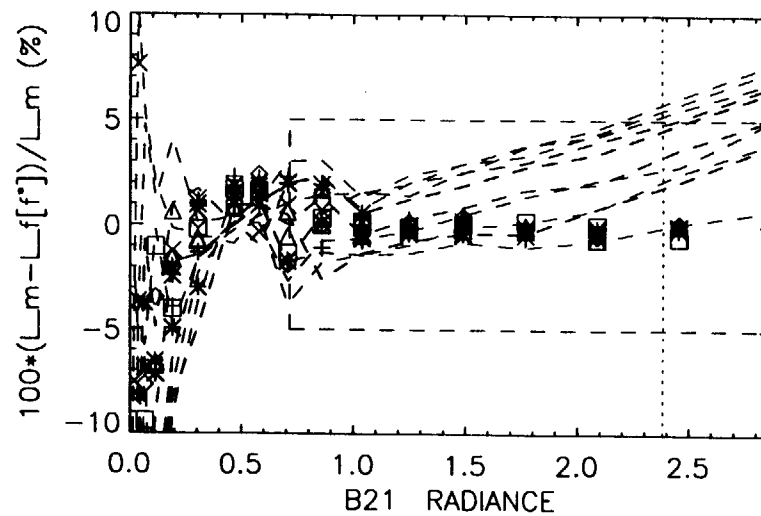
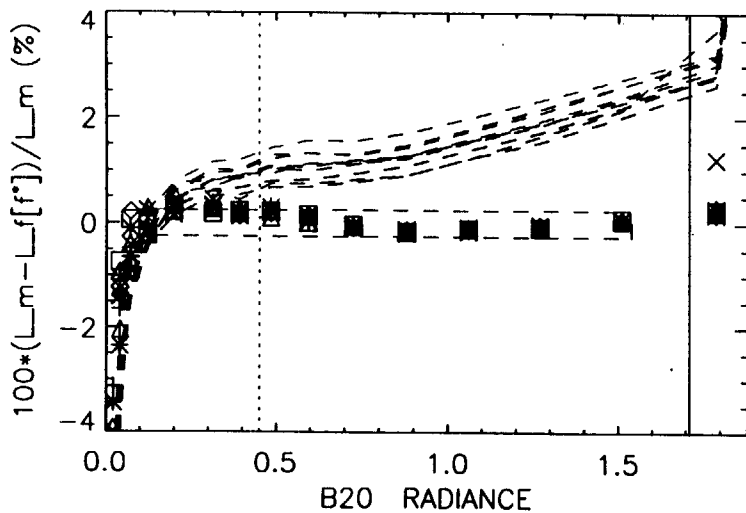


Ch1: Red x   Ch2: Blu +   Ch3: Blk \*   Ch4: Blk Δ   Ch5: Red ◇  
 Ch6: Grn □   Ch7: Grn x   Ch8: Grn +   Ch9: Blu \*   Ch10: Red Δ  
 Ltyp: Green Dotted Line;   Lmax: Red Solid Line; Box  
 Dashed Line Box:  $(0.3L_{typ} - 0.9L_{max}) \times (\pm)1/2$  Goal\*

Radiance:  $[W / (m^2 \cdot sr \cdot \mu m)]$   
 $L_m$ : Measured Radiance  
 $L_f$ : Fitting Rad. (symbols)  
 $L_f^*$ :  $L_f$  with fixed  $a_0^{nom}$ ,  $a_2^{nom}$  (dashed lines)

# Demonstration of Using Temperature Dependent Fitting Coefficients

UAID: 1402-1426 (HOT); T(instr)~283

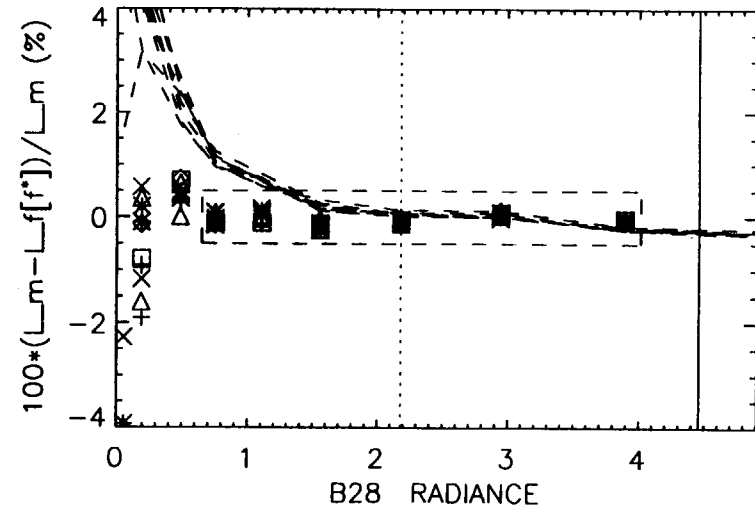
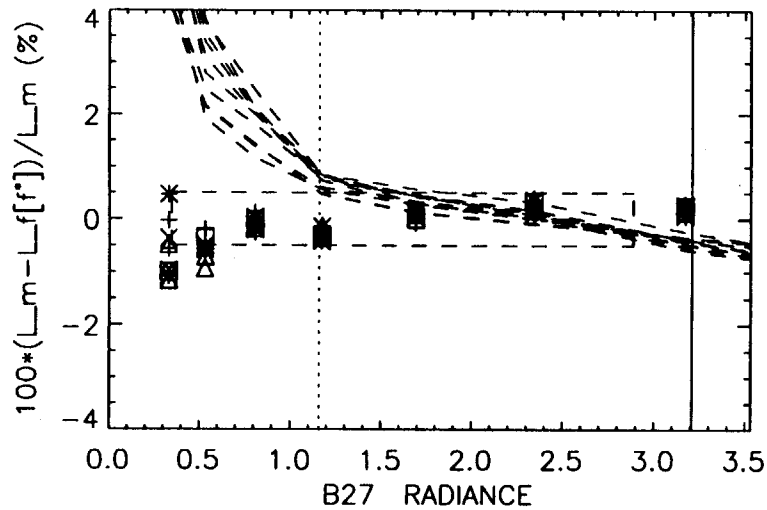
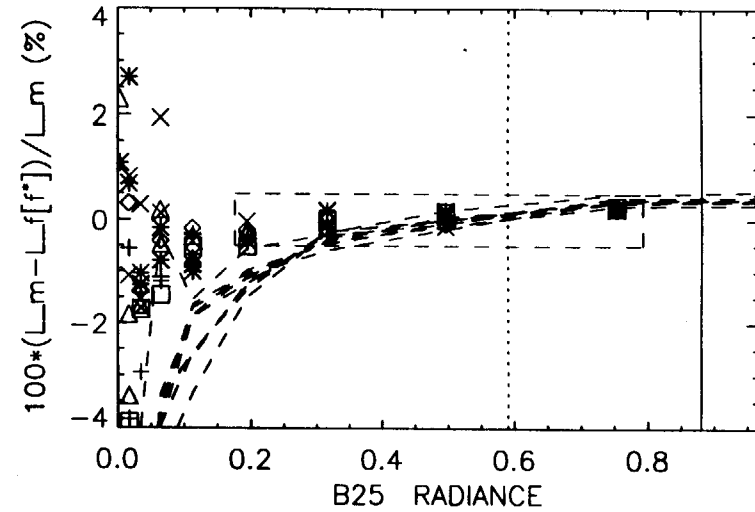
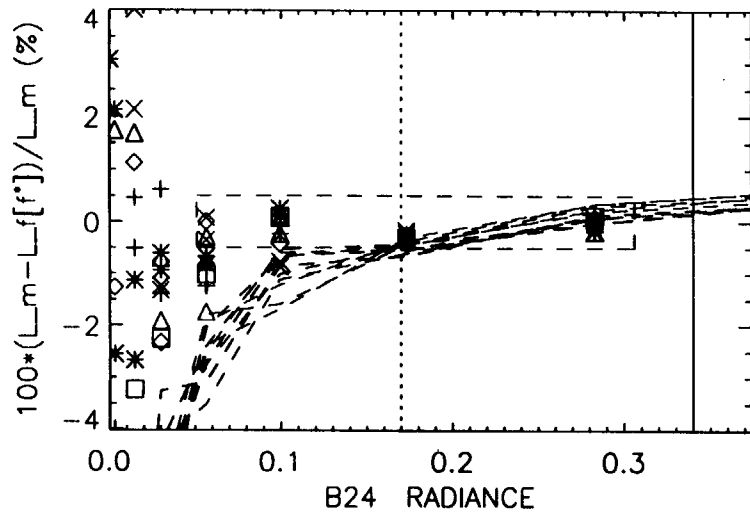


Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp: Green Dotted Line; Lmax: Red Solid Line; Box  
 Dashed Line Box:  $(0.3L_{typ} - 0.9L_{max}) \times (\pm)1/2$  Goal\*

Radiance:  $[W / (m^2-sr-\mu m)]$   
 $L_m$ : Measured Radiance  
 $L_f$ : Fitting Rad. (symbols)  
 $L_f^*$ :  $L_f$  with fixed  $a_0^{nom}$ ,  $a_2^{nom}$  (dashed lines)

# Demonstration of Using Temperature Dependent Fitting Coefficients

UAID: 1402-1426 (HOT); T(instr)~283

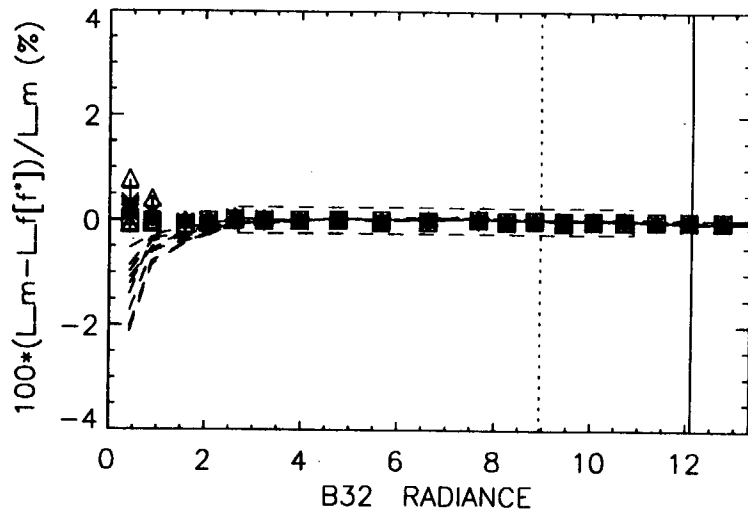
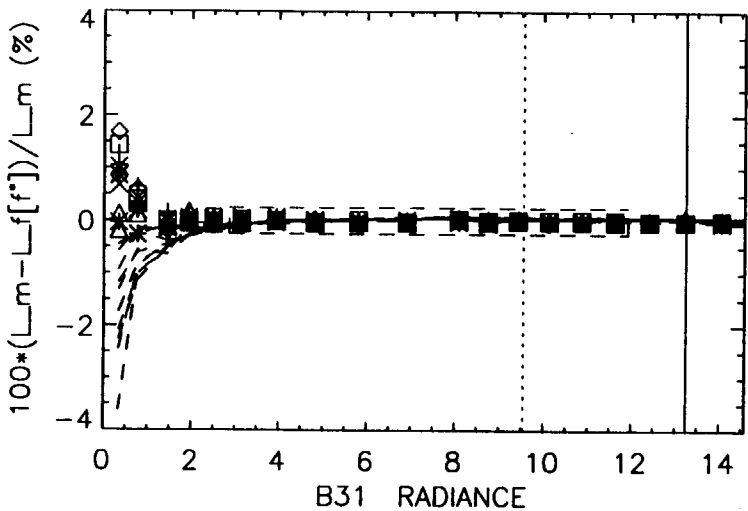
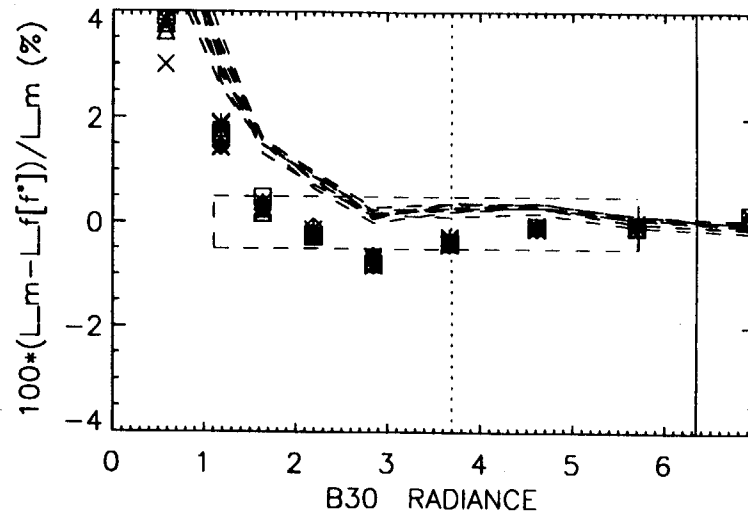
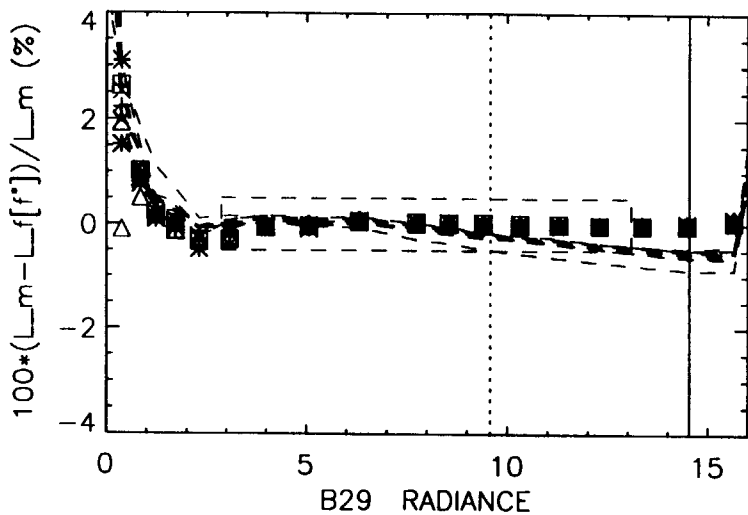


Ch1: Red x Ch2: Blu + Ch3: Blk \* Ch4: Blk Δ Ch5: Red ◇  
 Ch6: Grn □ Ch7: Grn x Ch8: Grn + Ch9: Blu \* Ch10: Red Δ  
 Ltyp: Green Dotted Line; Lmax: Red Solid Line; Box  
 Dashed Line Box:  $(0.3L_{typ} - 0.9L_{max}) \times (\pm)1/2$  Goal\*

Radiance:  $[W / (m^2-sr-\mu m)]$   
 $L_m$ : Measured Radiance  
 $L_f$ : Fitting Rad. (symbols)  
 $L_f^*$ :  $L_f$  with fixed  $a_0^{nom}$ ,  $a_2^{nom}$  (dashed lines)

# Demonstration of Using Temperature Dependent Fitting Coefficients

UAID: 1402-1426 (HOT);  $T(\text{instr}) \sim 283$

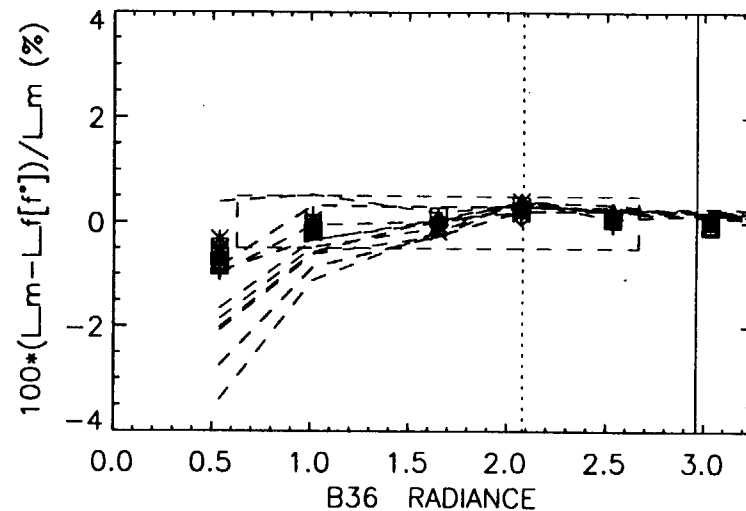
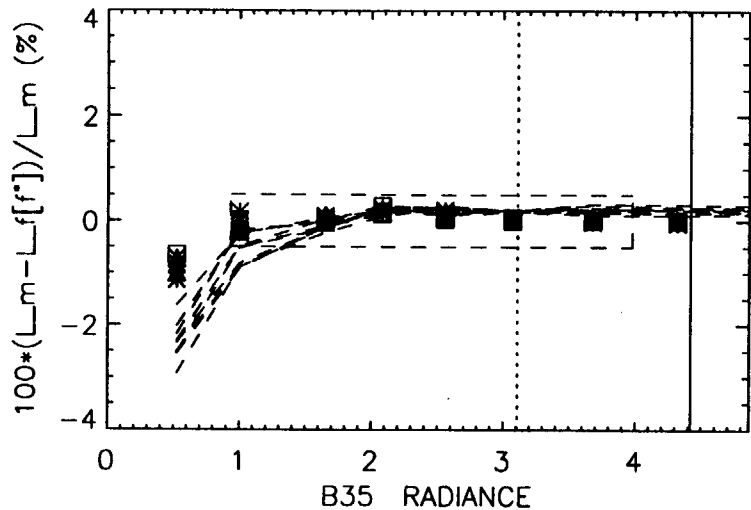
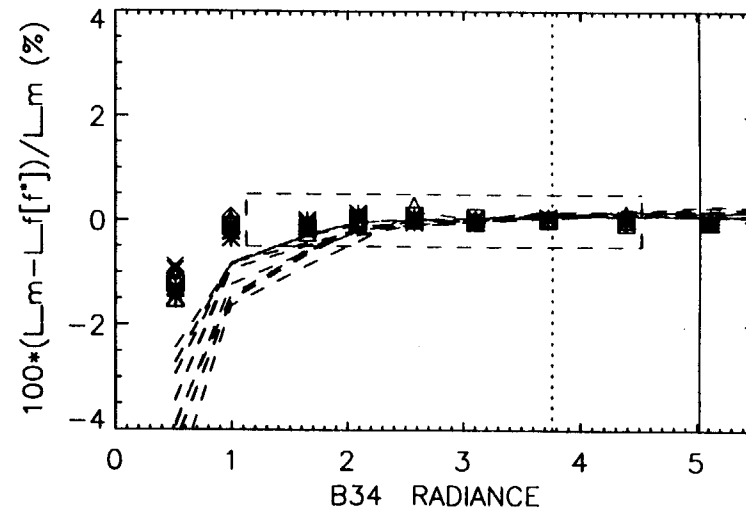
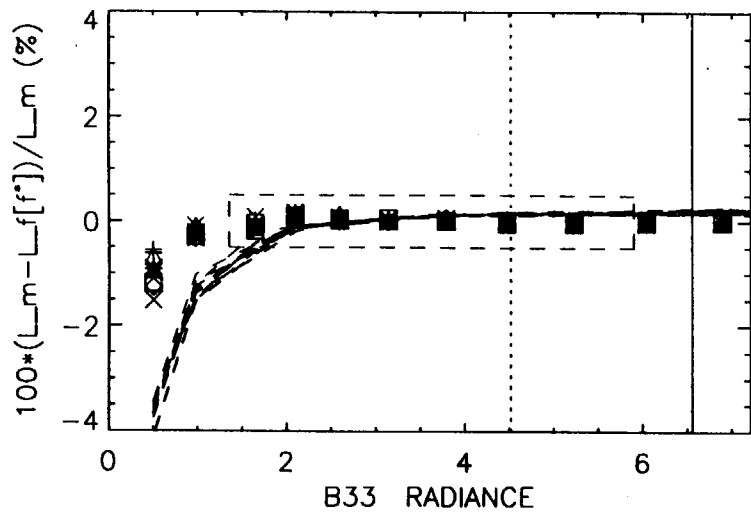


Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ    Ch5: Red ◇  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*    Ch10: Red Δ  
 Ltyp: Green Dotted Line;    Lmax: Red Solid Line; Box  
 Dashed Line Box:  $(0.3L_{tpy} - 0.9L_{max}) \times (\pm)1/2$  Goal\*

Radiance:  $[W / (m^2-sr-\mu m)]$   
 $L_m$ : Measured Radiance  
 $L_f$ : Fitting Rad. (symbols)  
 $L_f^*$ :  $L_f$  with fixed  $a_0^{nom}$ ,  $a_2^{nom}$  (dashed lines)

# Demonstration of Using Temperature Dependent Fitting Coefficients

UAID: 1402-1426 (HOT);  $T(\text{instr}) \sim 283$

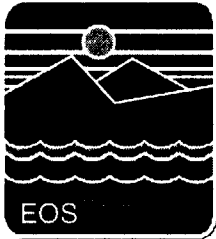


Ch1: Red x    Ch2: Blu +    Ch3: Blk \*    Ch4: Blk Δ    Ch5: Red ◇  
 Ch6: Grn □    Ch7: Grn x    Ch8: Grn +    Ch9: Blu \*    Ch10: Red Δ  
 Ltyp: Green Dotted Line;    Lmax: Red Solid Line; Box  
 Dashed Line Box:  $(0.3L_{\text{typ}} - 0.9L_{\text{max}}) \times (\pm)1/2 \text{ Goal}^*$

Radiance:  $[W / (m^2-sr-\mu m)]$   
 $L_m$ : Measured Radiance  
 $L_f$ : Fitting Rad. (symbols)  
 $L_f^*$ :  $L_f$  with fixed  $a_0^{\text{nom}}$ ,  $a_2^{\text{nom}}$  (dashed lines)

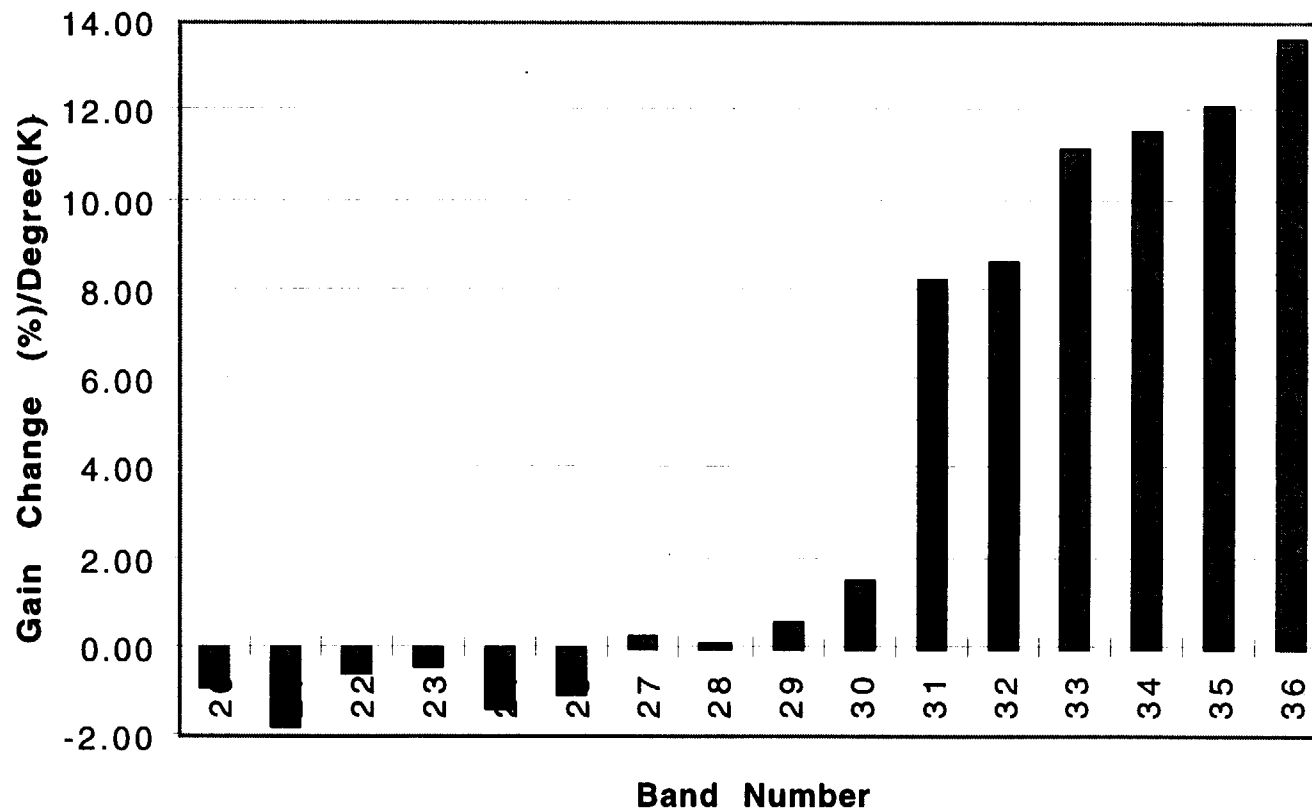
# FPA Temperature Effects

(@77K, 83K and 85K

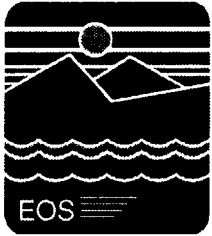


# Focal Plane Temperature Effect on Gain

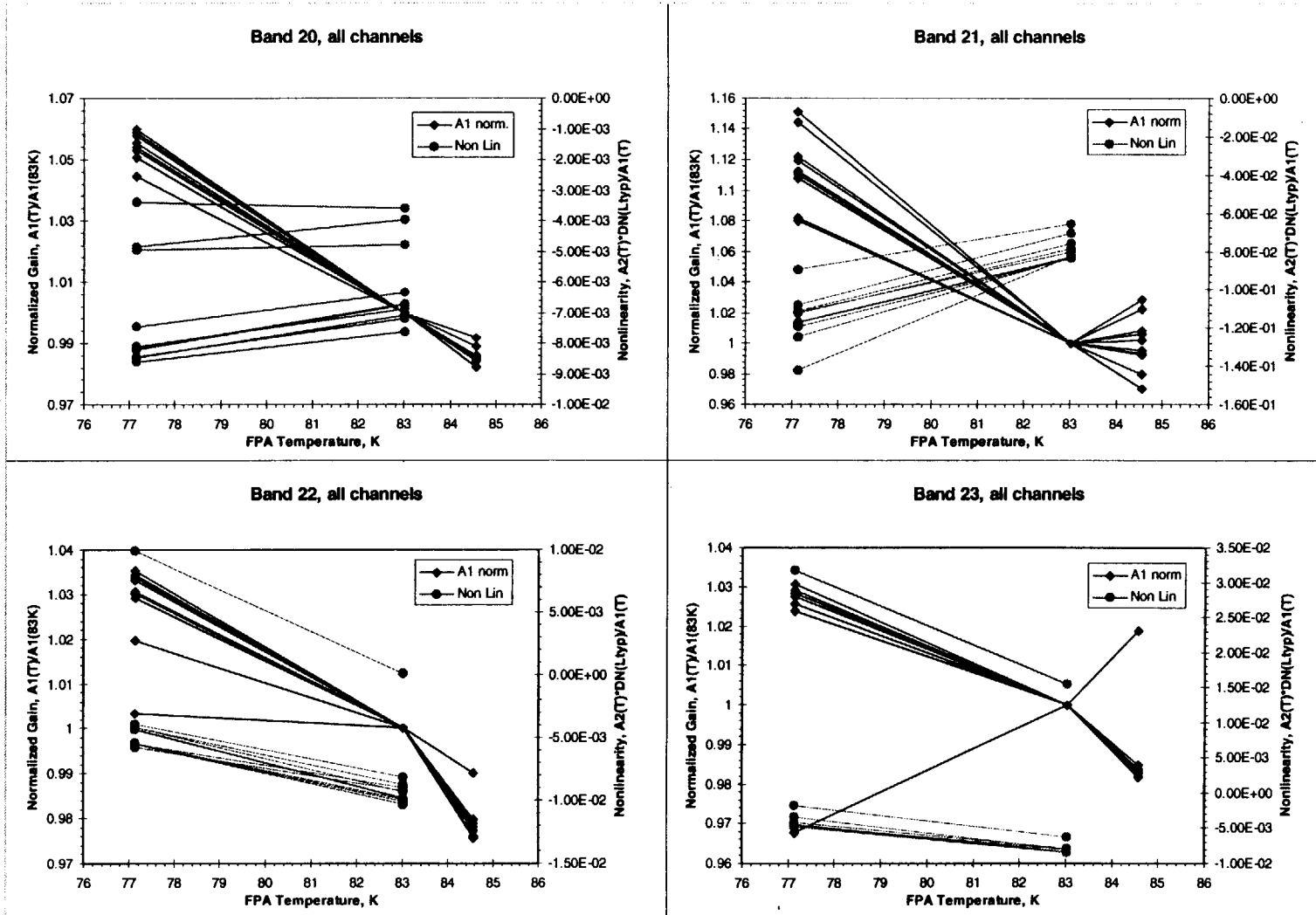
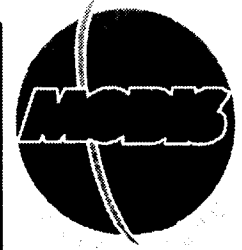
(with decreasing FPA temperature: 83K to 77K)

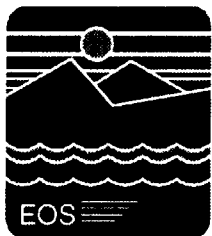




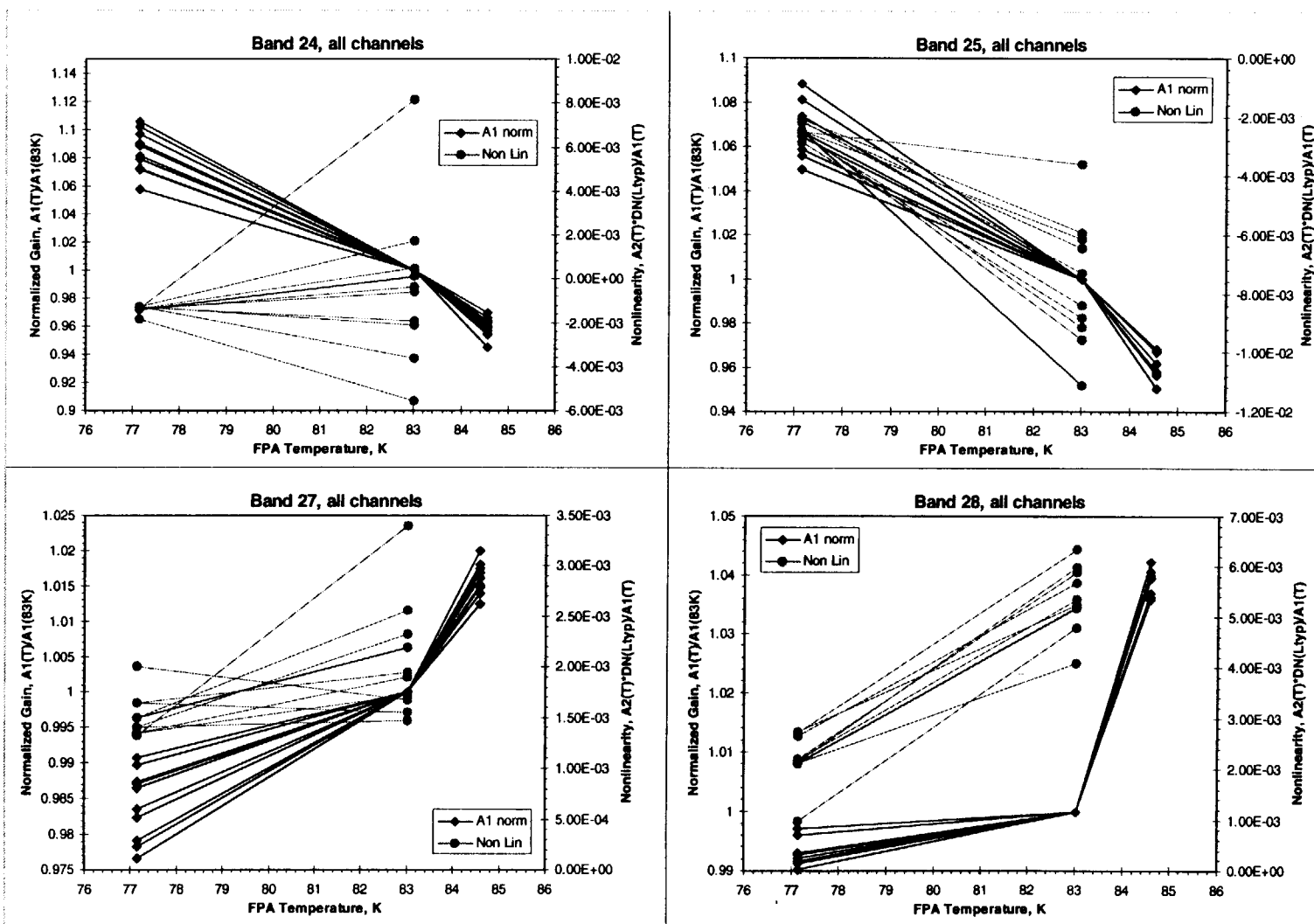


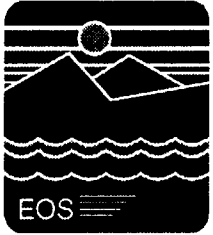
# Effect of FPA Temperature on First Order Coefficient and Nonlinearity (1 of 4)



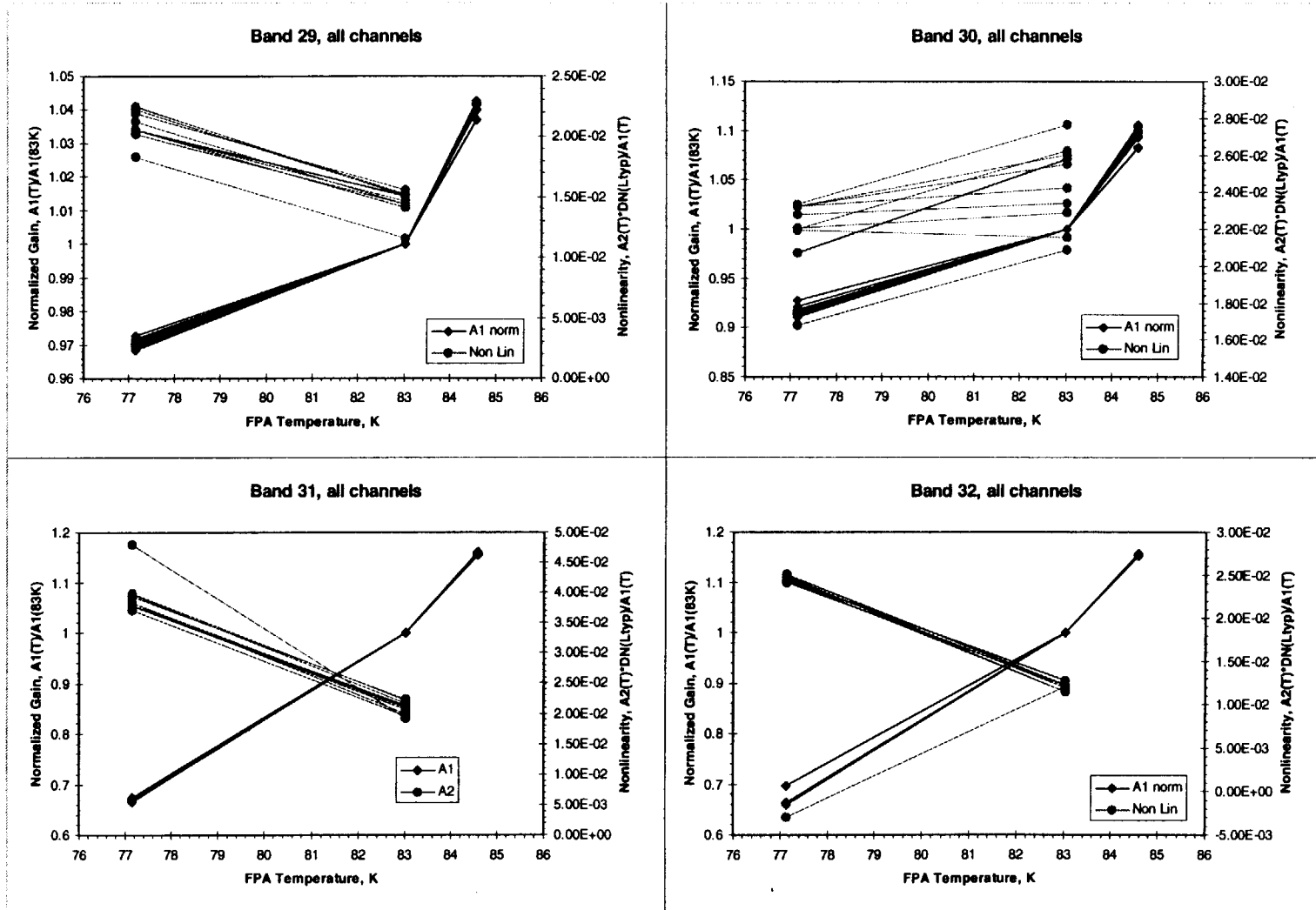
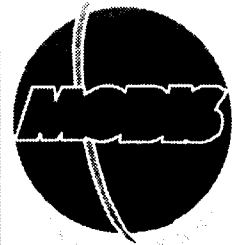


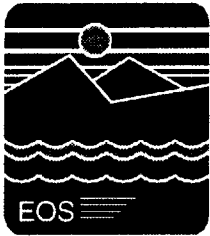
# Effect of FPA Temperature on First Order Coefficient and Nonlinearity (2 of 4)



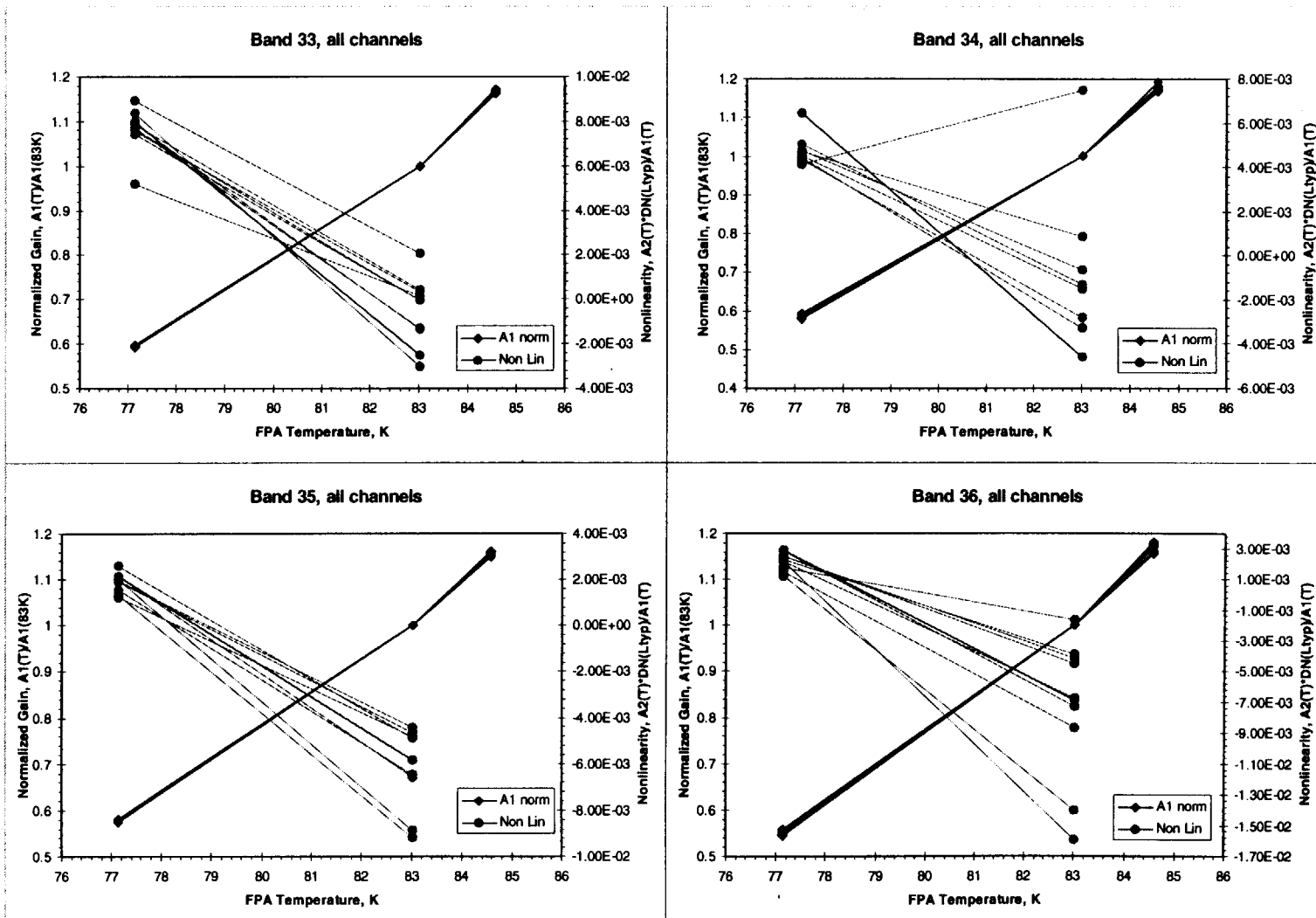
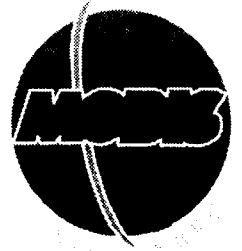


# Effect of FPA Temperature on First Order Coefficient and Nonlinearity (3 of 4)

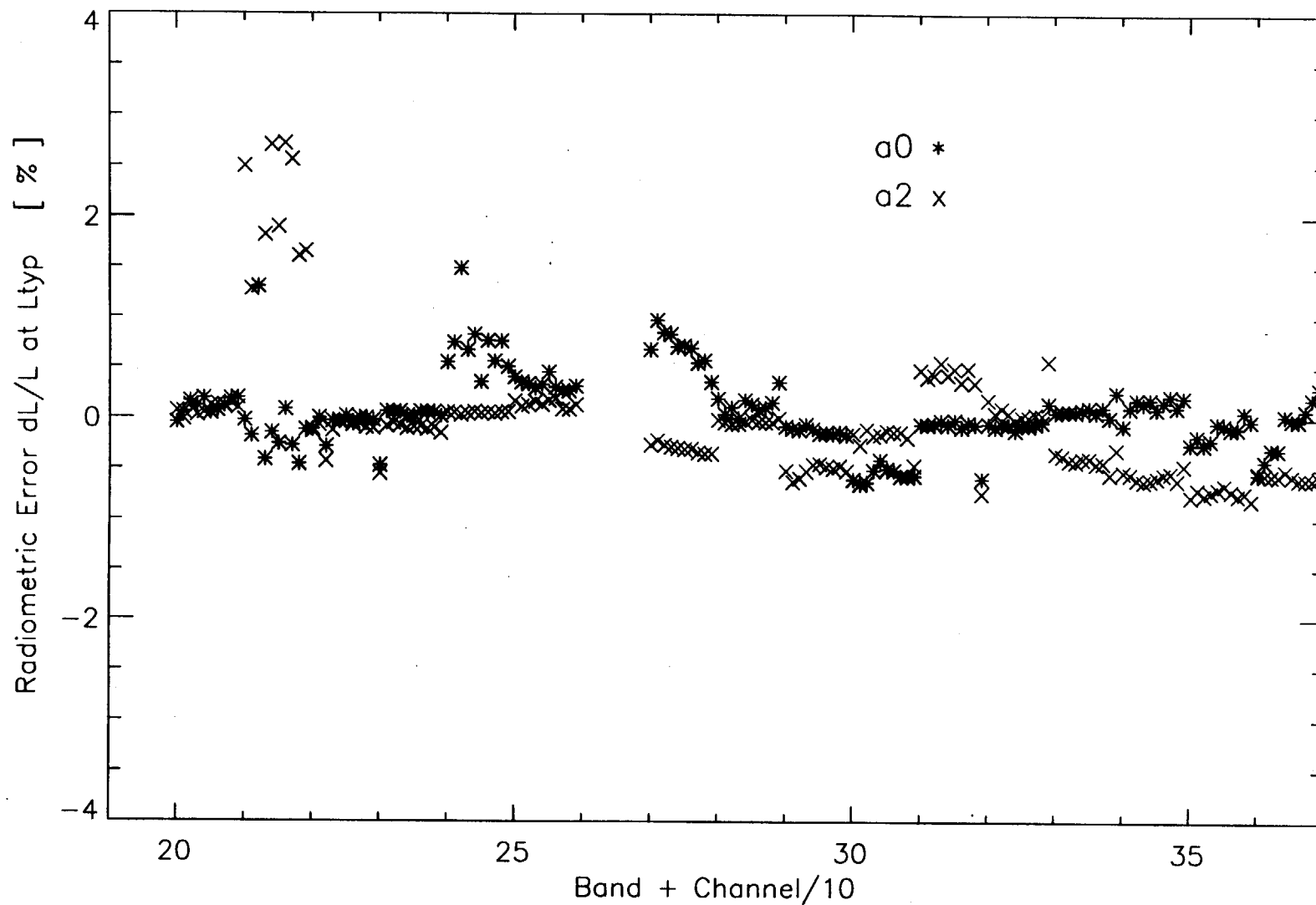




# Effect of FPA Temperature on First Order Coefficient and Nonlinearity (4 of 4)



Radiometric Error Due to FPA Temperature Change from 77 K to 83 K  
Nominal Plateau (273K); UAID 1595–1618 (83 K) and UAID 1644–1654 (77 K)

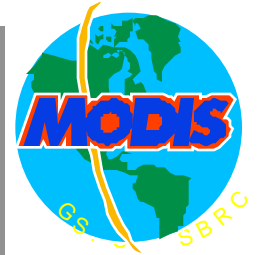


Quadratic Fitting:  $L = a0 + a1dn + a2dn^2$

# Comparisons of BCS and OBC Blackbody Calibration Coefficients



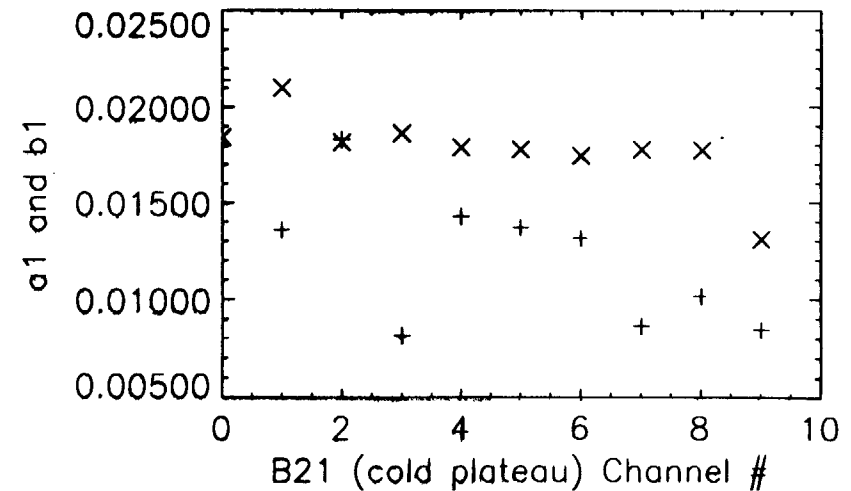
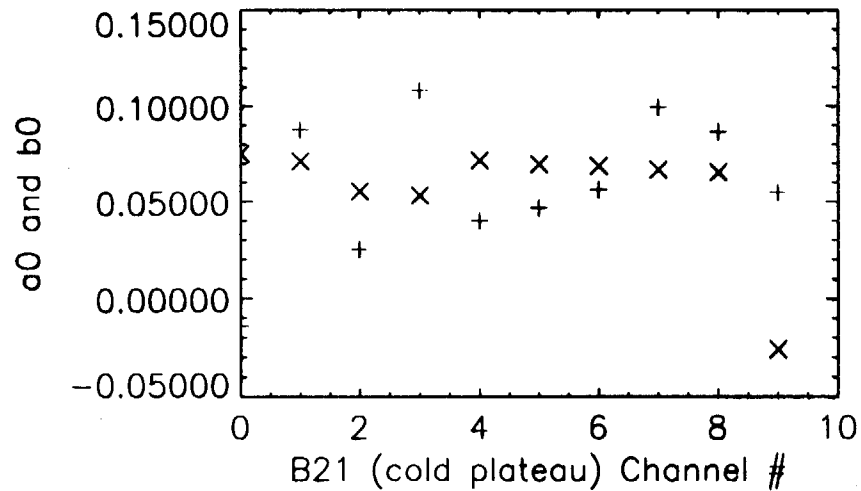
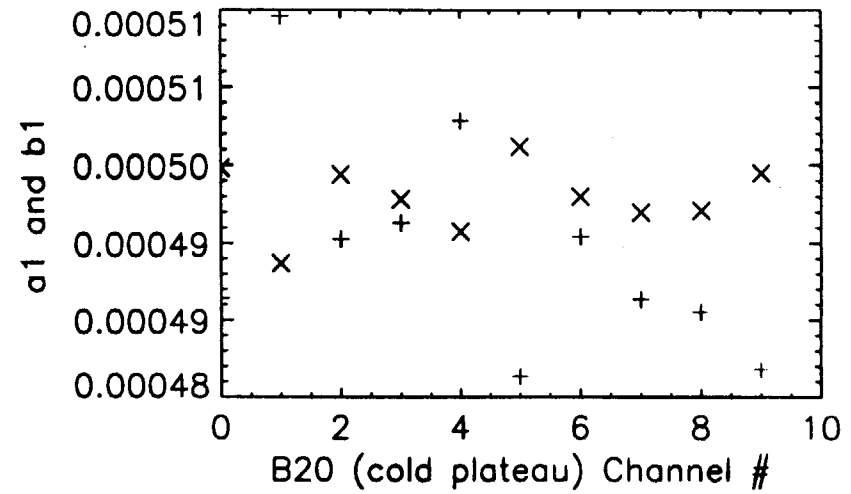
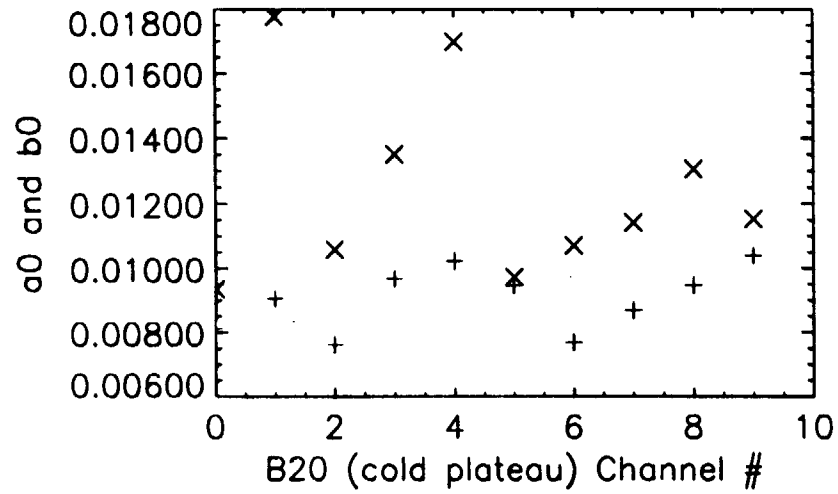
# OBC Blackbody Warm Up and Cool Down Data Collects (MFI-09)



Instrument Temperature	Blackbody Warmup	Blackbody Cooldown	Data Limitations
<b>Cold Plateau</b> $T_{instr} = 256K$		UAID 1340 BB temp range 292-273K	No Warmup data.
<b>Nominal Plateau</b> $T_{instr} = 273K$	UAIDs 1524,1543 BB temp range 284.9-305K	UAID 1544 BB temp range 312-282K Heater off	Due to incorrect setting of gains the PV bands are not useable for this dataset. Space view DNs are set to zero for several bands.
<b>Hot Plateau</b> $T_{instr} = 283K$	UAID 1454 BB temp range 287-315K Heater off	UAID 1455 BB temp range 312-290K	

Fitting coefficients for RC02 and MF109 data;

$E = 0.997$ ;  $dT_{obc} = 0.0K$

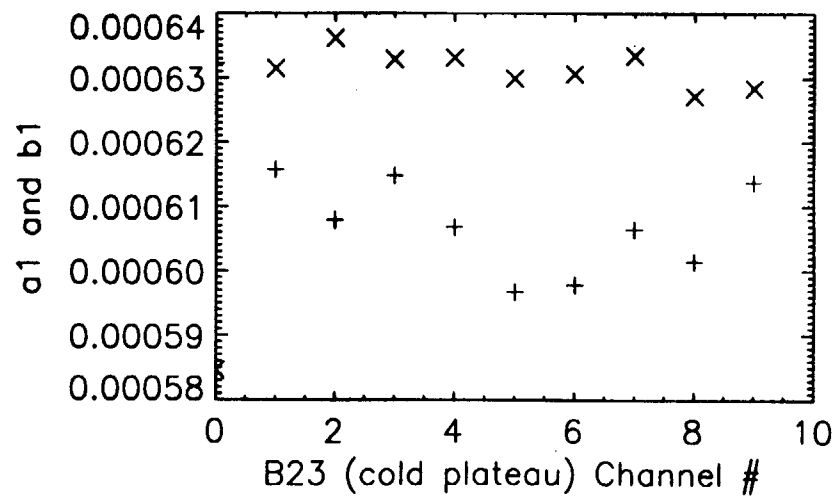
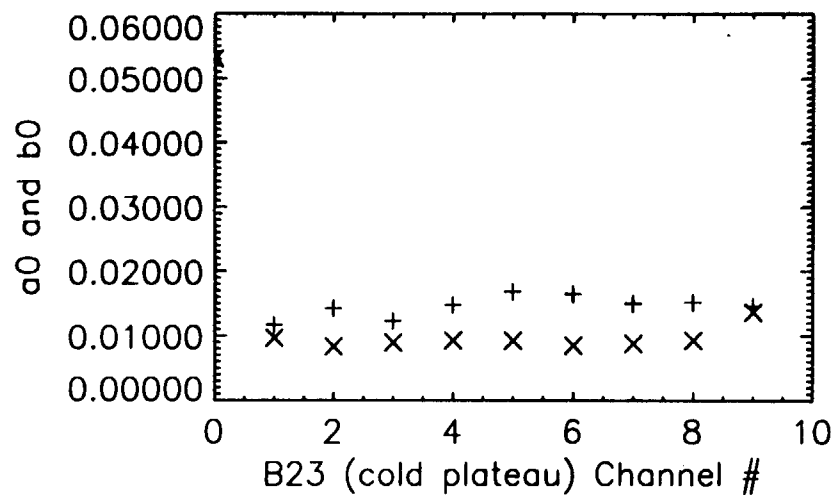
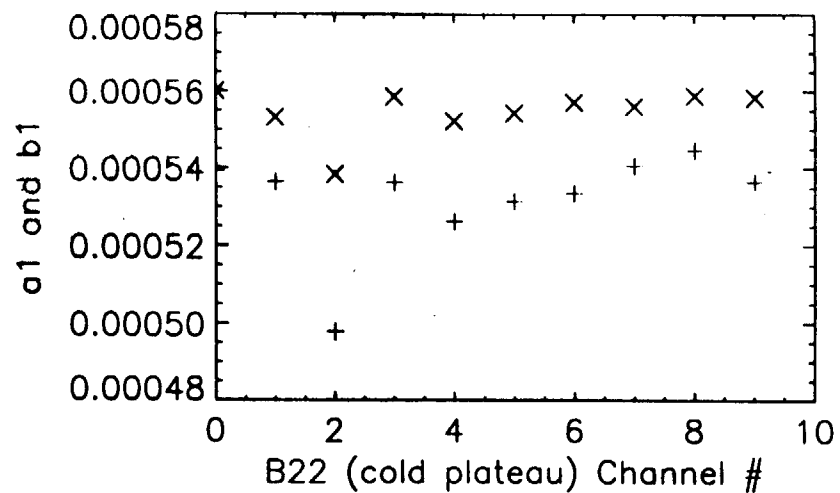
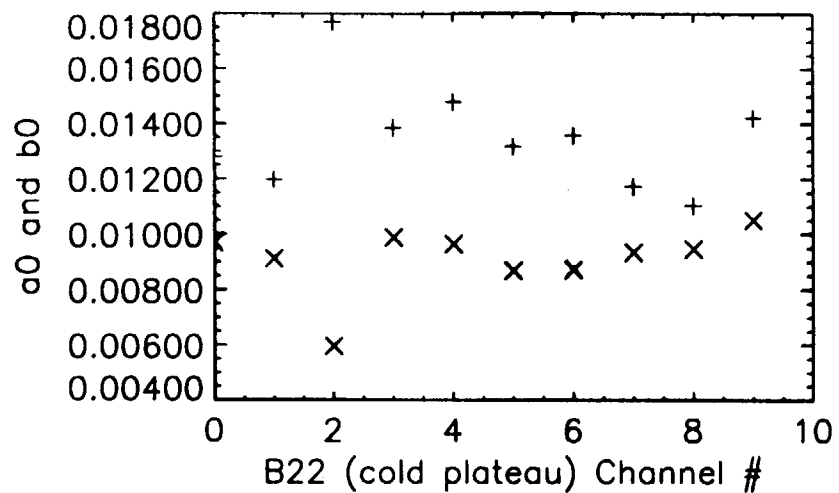


Note:  $a_0, a_1$  denoted by (x) from RC02 data;  $b_0, b_1$  denoted by (+) from MF109 data



Fitting coefficients for RC02 and MFI09 data;

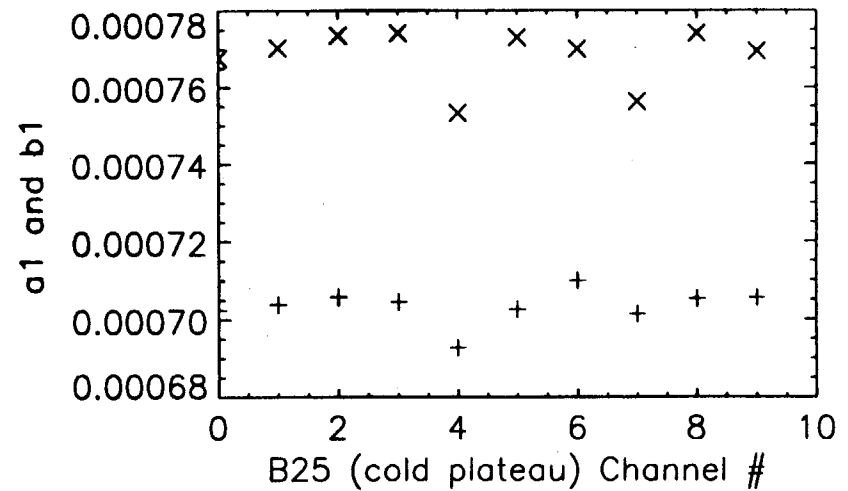
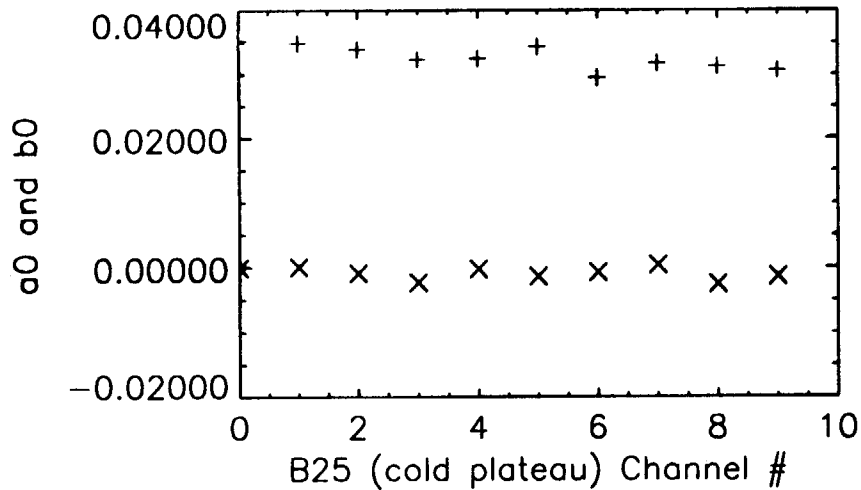
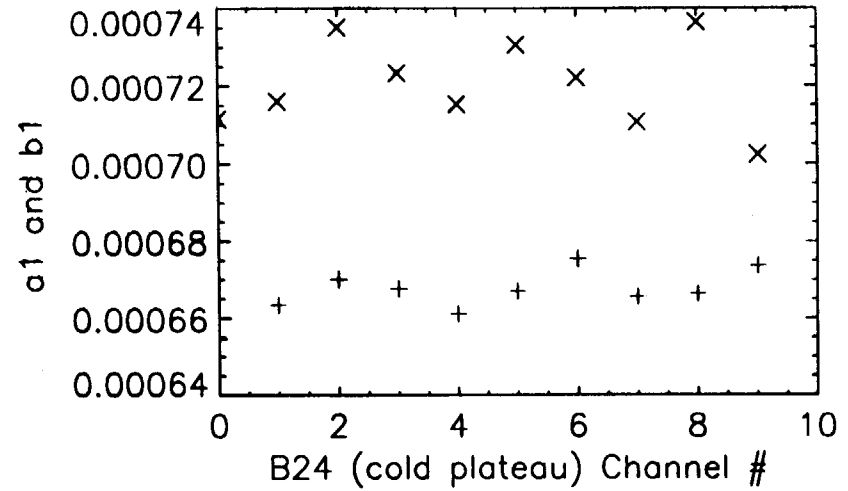
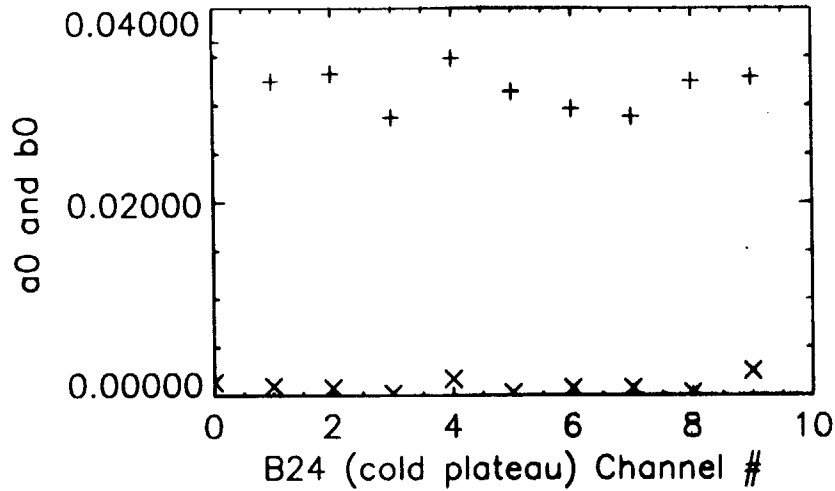
$E = 0.997$ ;  $dT_{obc} = 0.0K$



Note:  $a_0, a_1$  denoted by (x) from RC02 data;  $b_0, b_1$  denoted by (+) from MFI09 data

Fitting coefficients for RC02 and MFI09 data;

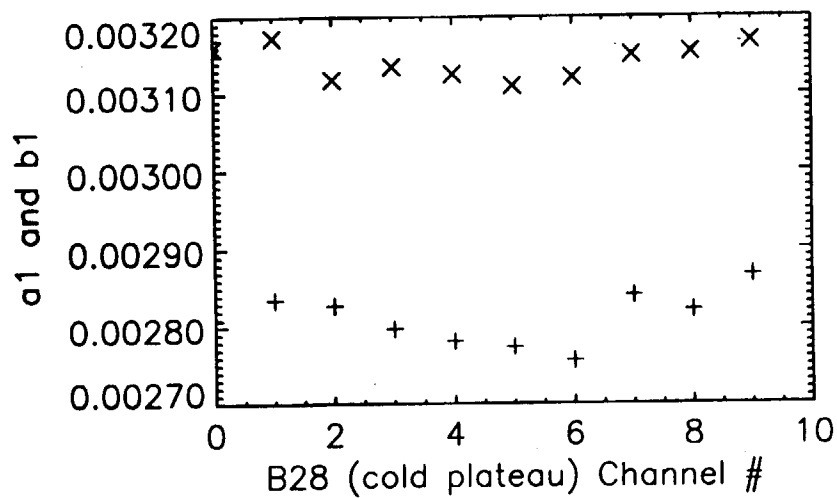
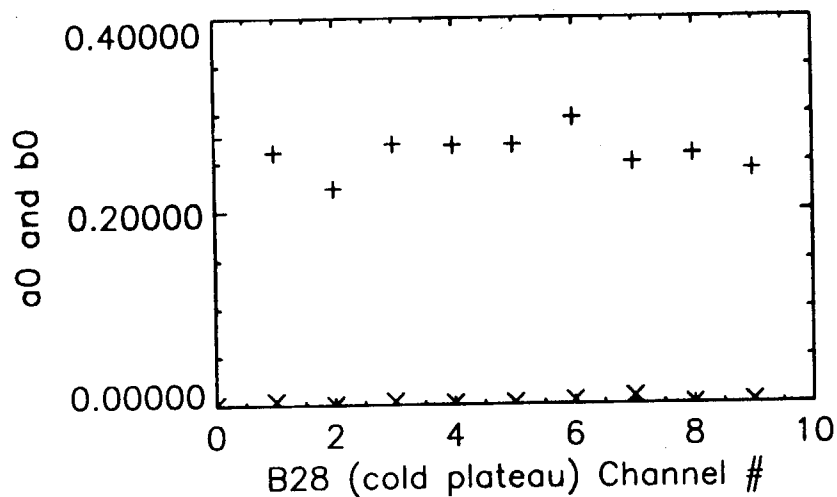
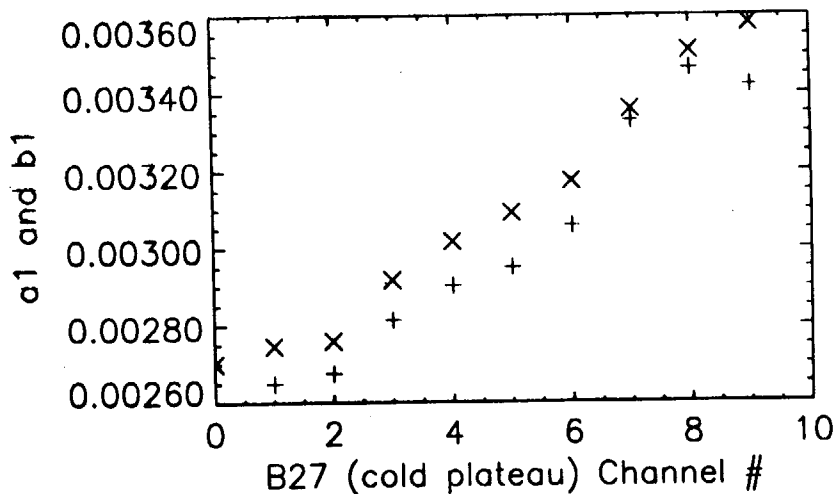
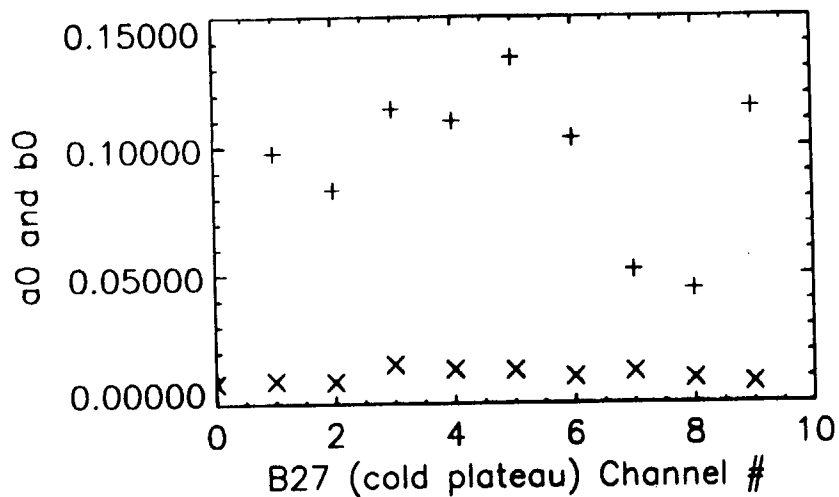
$E = 0.997$ ;  $dT_{\text{obc}} = 0.0\text{K}$



Note:  $a_0, a_1$  denoted by (X) from RC02 data;  $b_0, b_1$  denoted by (+) from MFI09 data

Fitting coefficients for RC02 and MFI09 data;

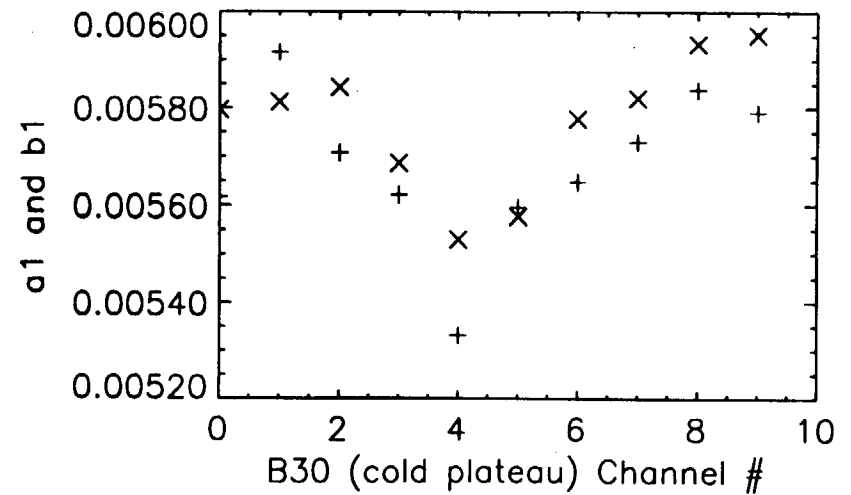
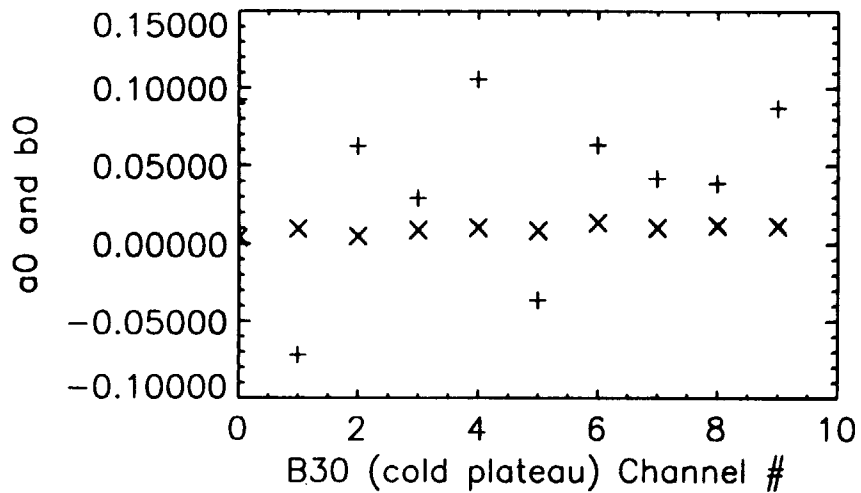
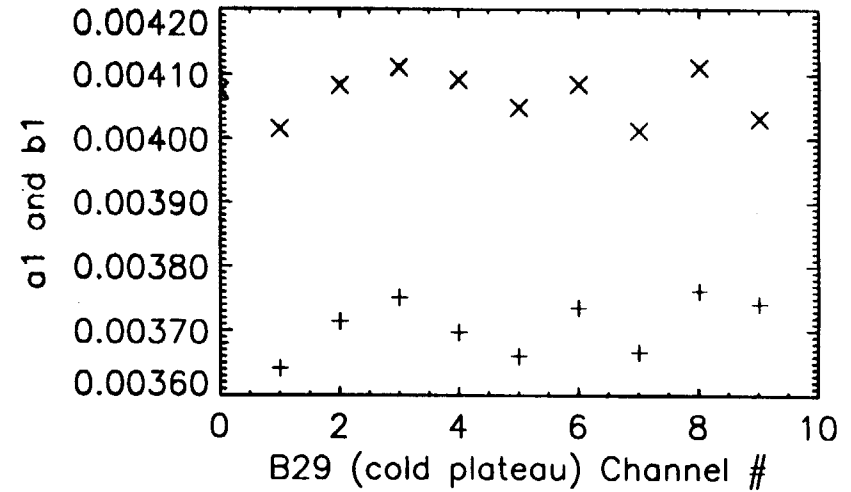
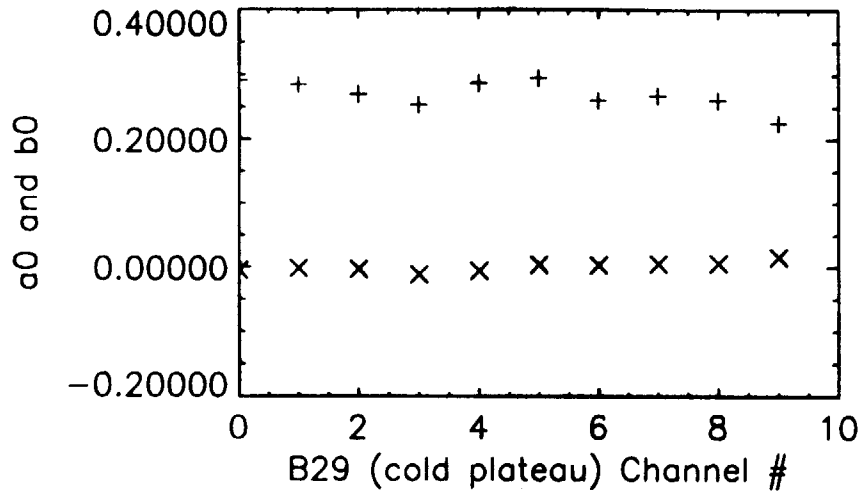
$E = 0.997$ ;  $dT_{obc} = 0.0K$



Note:  $a_0, a_1$  denoted by (x) from RC02 data;  $b_0, b_1$  denoted by (+) from MFI09 data

Fitting coefficients for RC02 and MFI09 data;

$E = 0.997$ ;  $dT_{\text{obc}} = 0.0\text{K}$

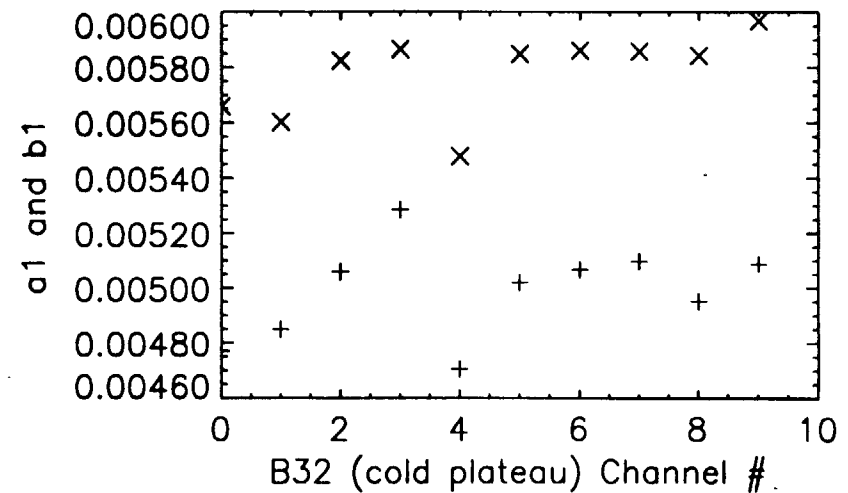
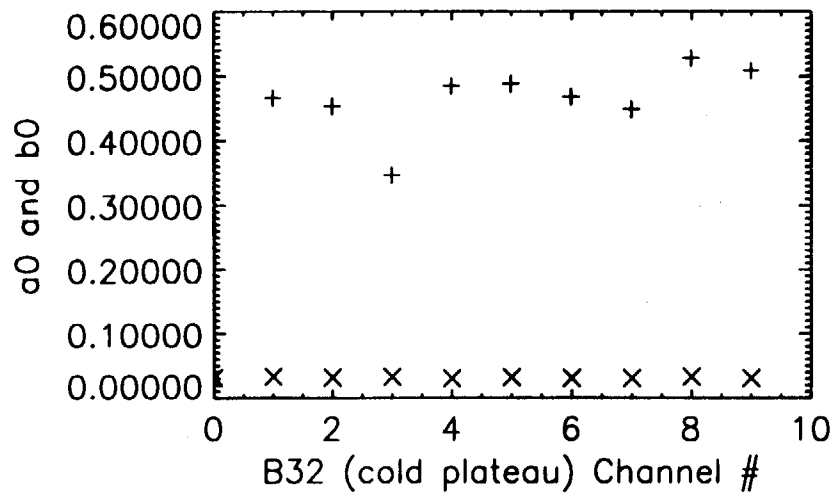
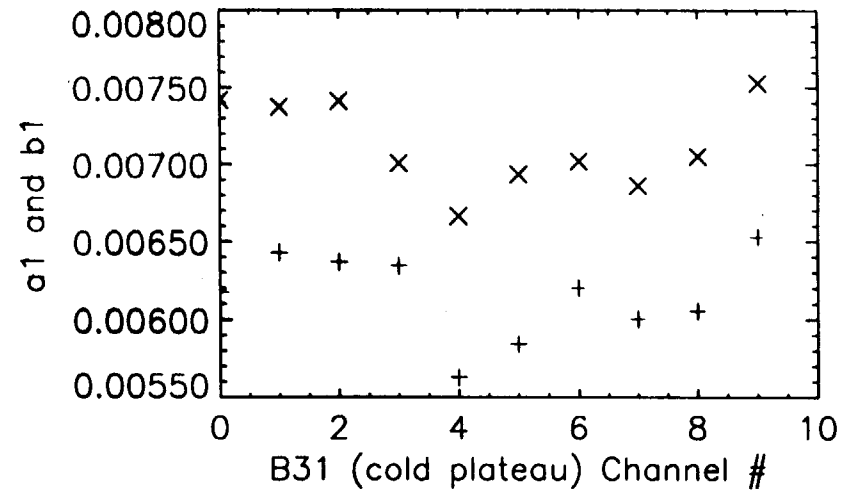
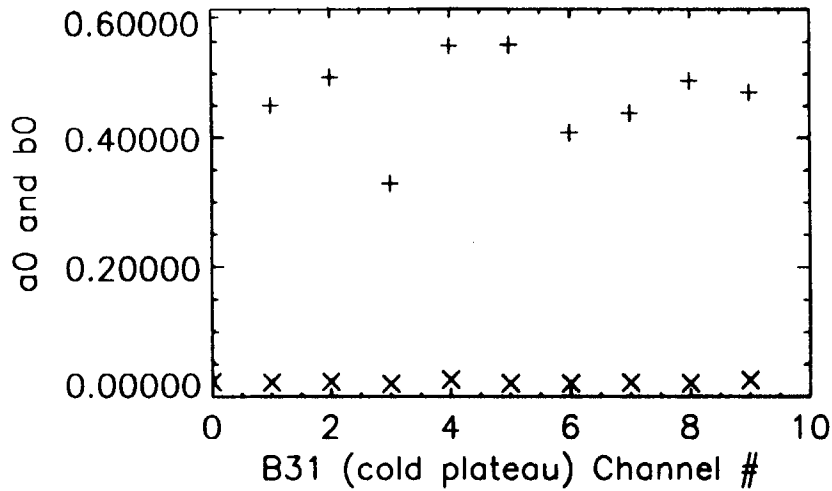


Note:  $a_0, a_1$  denoted by (x) from RC02 data;  $b_0, b_1$  denoted by (+) from MFI09 data

5-204

Fitting coefficients for RC02 and MFI09 data;

$E = 0.997$ ;  $dT_{obc} = 0.0K$

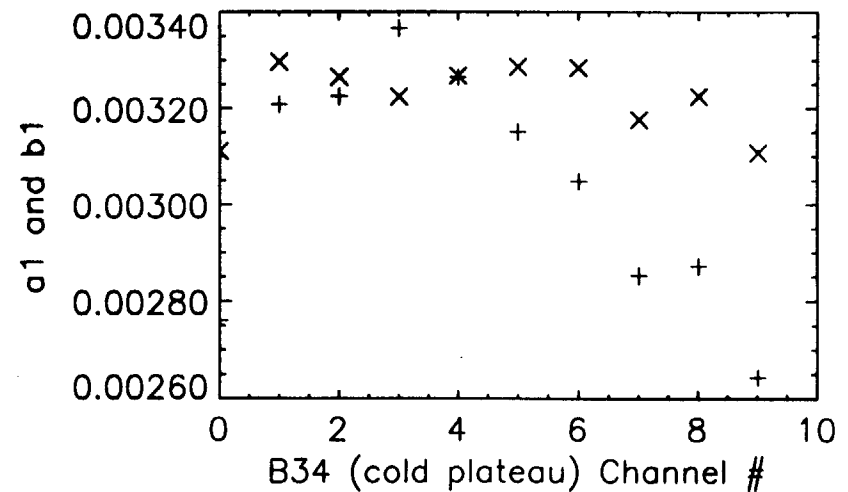
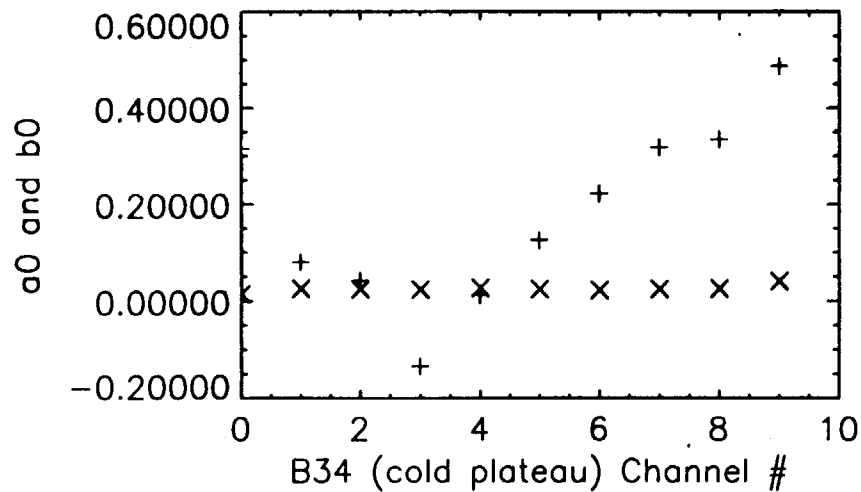
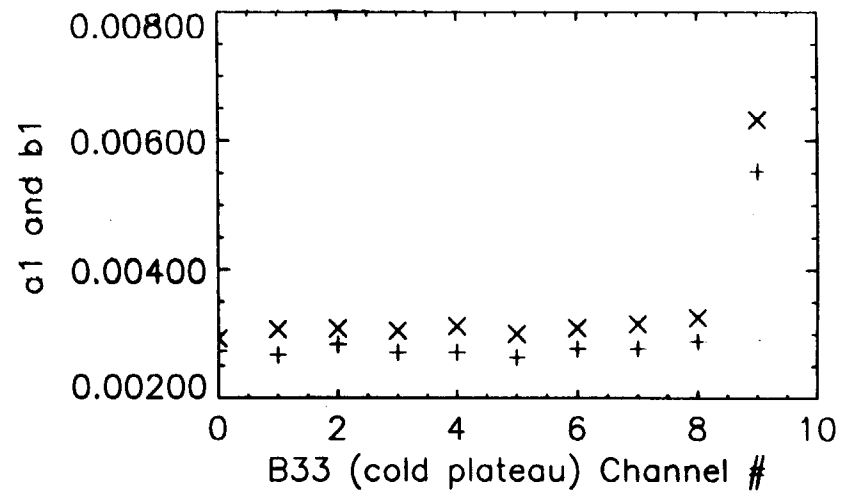
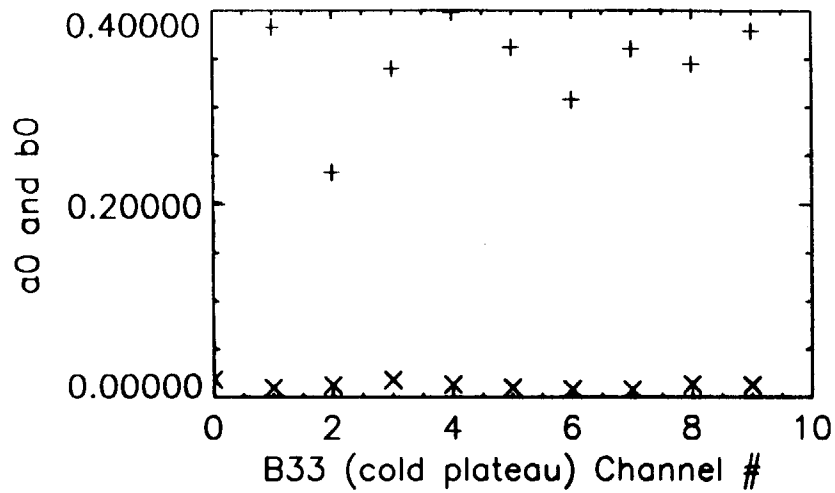


Note:  $a_0, a_1$  denoted by (X) from RC02 data;  $b_0, b_1$  denoted by (+) from MFI09 data

5-205

Fitting coefficients for RC02 and MFI09 data;

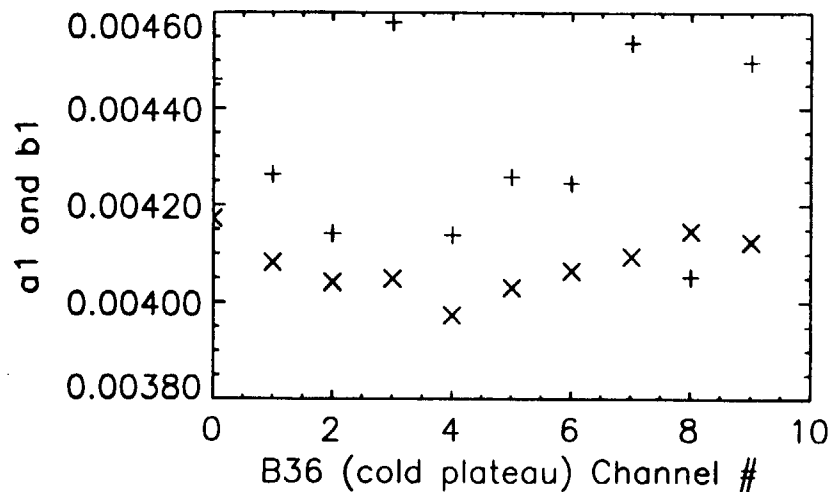
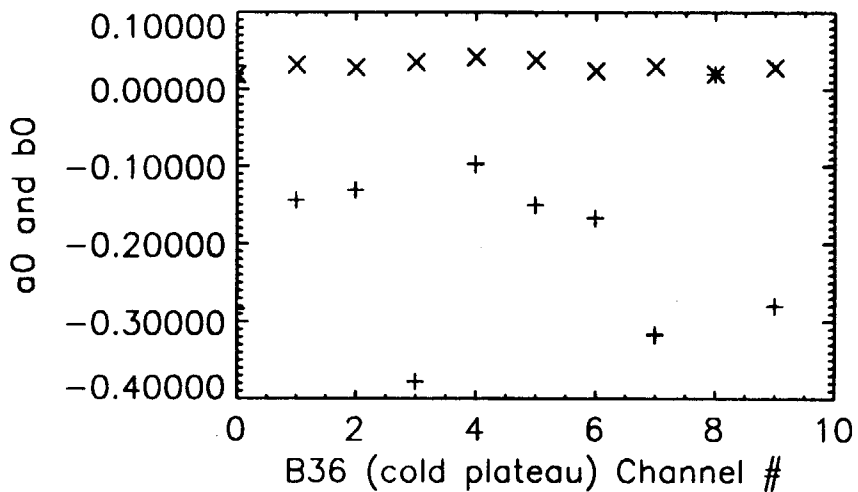
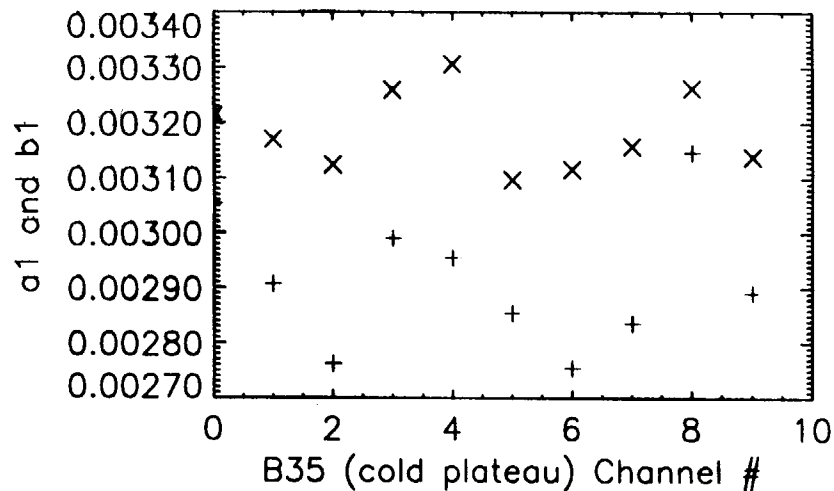
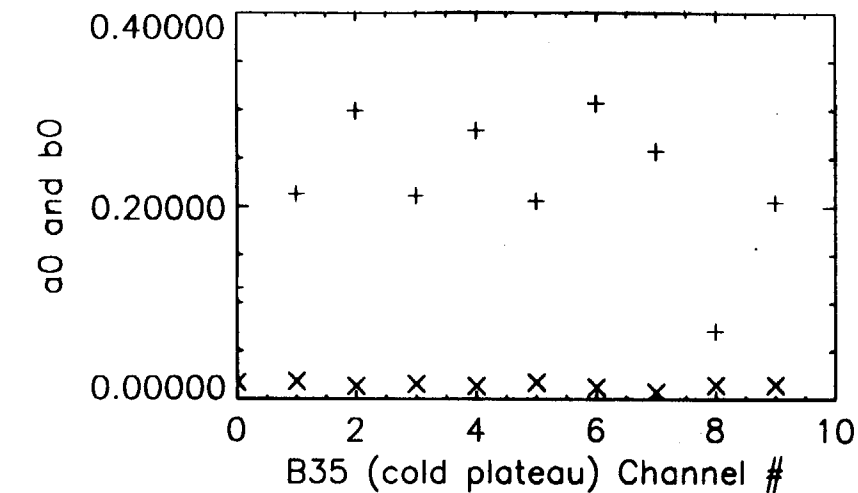
$E = 0.997$ ;  $dT_{obc} = 0.0K$



Note:  $a_0, a_1$  denoted by (x) from RC02 data;  $b_0, b_1$  denoted by (+) from MFI09 data

Fitting coefficients for RC02 and MFI09 data;

$E = 0.997$ ;  $dT_{obc} = 0.0K$



Note:  $a_0, a_1$  denoted by (x) from RC02 data;  $b_0, b_1$  denoted by (+) from MFI09 data

# Comparability Assessments

Primary electronics vs Redundant Electronics  
Mirror Side A vs Mirror Side B



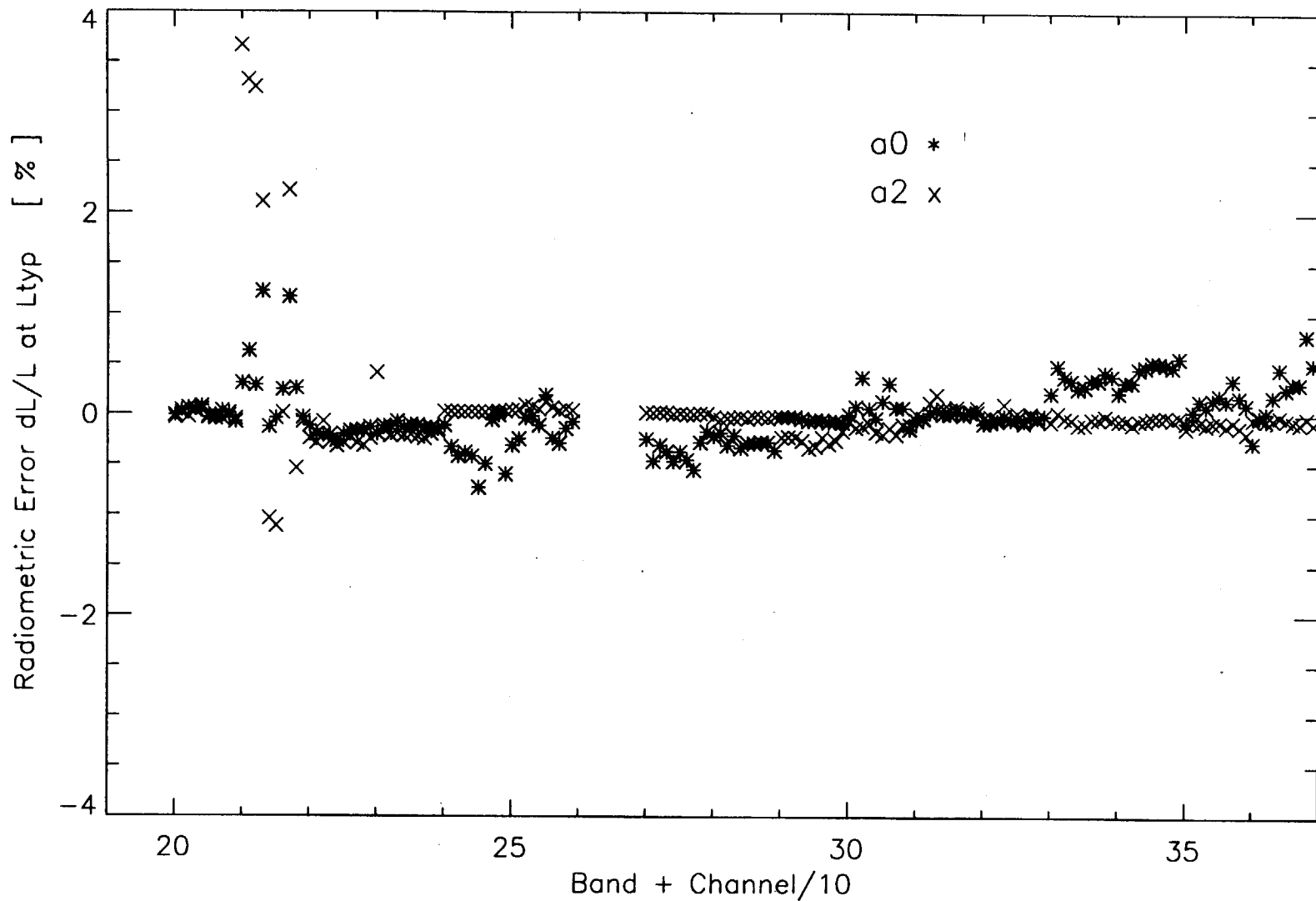
# Comparability Assessment

Primary Electronics

VS

Secondary (Redundant) Electronics

Radiometric Error Due to Elec. Change from Primary to Redundant  
Nominal Plateau (273K); UAID 1506-1526 and UAID 1528-1538



Quadratic Fitting:  $L = a_0 + a_1dn + a_2dn^2$



# L vs DN Calibration Conclusions



- Quadratic algorithm achieves reasonable fitting errors for most bands
- Cubic algorithm recommended for Bands 20, 22 and 23
- BCS to OBC Blackbody calibration transfer requires consideration of variable scan mirror reflectances
- Short term stability is  $<0.5\%$  for all bands (except Band 21)
- L1B algorithm must account for temperature dependence of calibration coefficients
- Operating CFPAs at NLT (control heater off) changes gain of the PV bands by about 5%, and the PC bands by about 50-60%
- Changing electronics from Primary to Redundant will cause a small offset change, perhaps requiring separate calibration coefficients
- There is a detectable difference between mirror sides for all bands. This must be accounted for in the L1B algorithm coefficient set.