POLARIZATION DATA--STATUS OF GSFC ANALYSIS
March 15, 1995

SBRC has delivered 4 sets of polarization data to GSFC.

- Set 1: Bands 1-4,8 at -45, 0, 35 and 45 degrees.
- Set 2: Band 1 at 45 degrees (different gains).
- Set 3: Bands 3-4,8,13,14 at 45 degrees (different gains).
- Set 4: Bands 3,4,8 (taken in March).

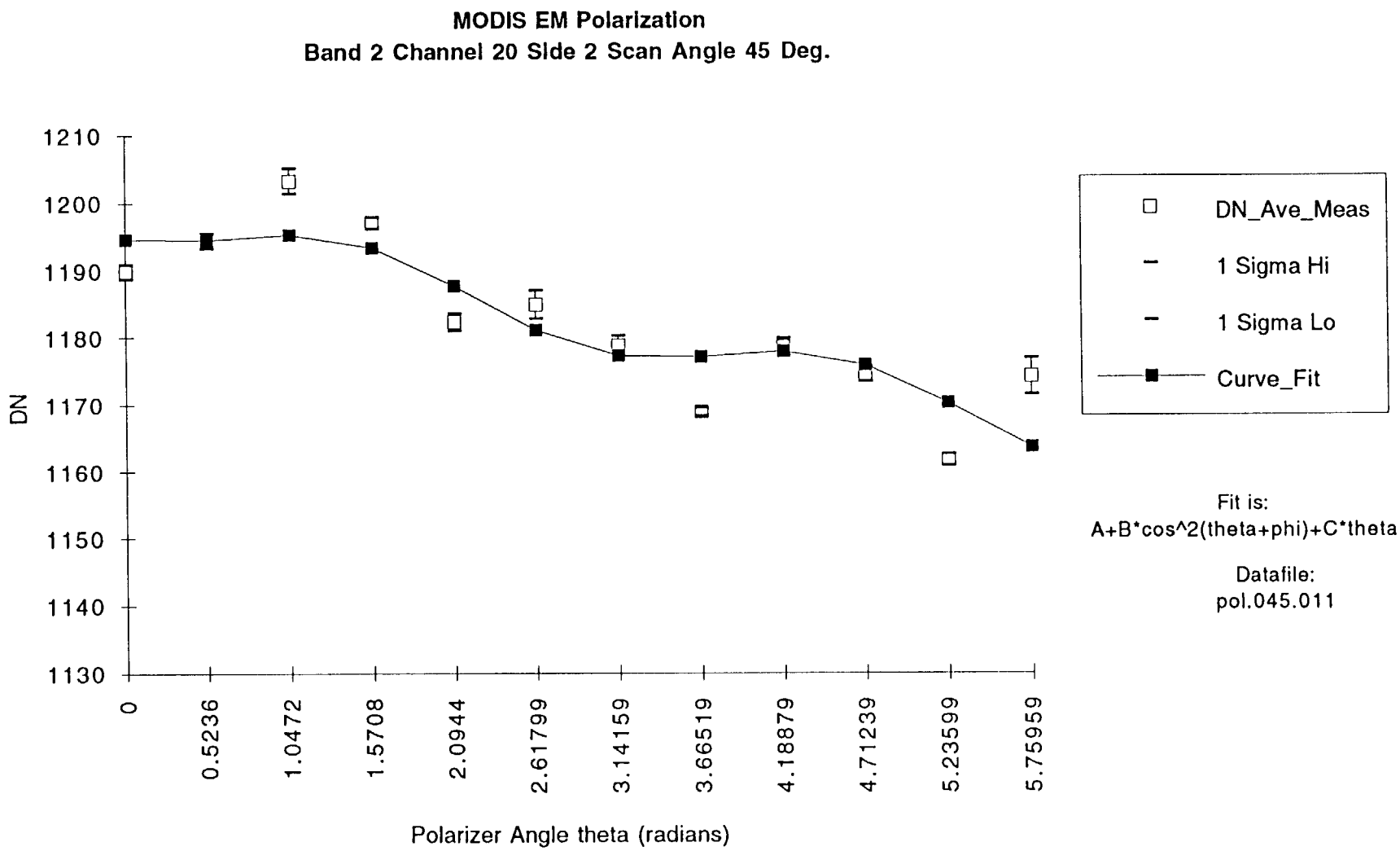
Set 1 has been processed and examined. Sets 2-3 have been processed.

The Raw Data has noise and some yet to be explained features. Taking Peak-To-Peak differences, all detectors in Set 1 have polarization < 3%

To minimize noise, SBRC fits a curve through the data. One expects to see a cos^2 variation; a slope is also observed. SBRC includes the slope in their fits. Using the fit values lowers the polarization factor by ~0.5%.

Differences between channels within a band are observed to be up to 1%. Channels at one end of the track (detectors near 10,20,40) are consistently high.

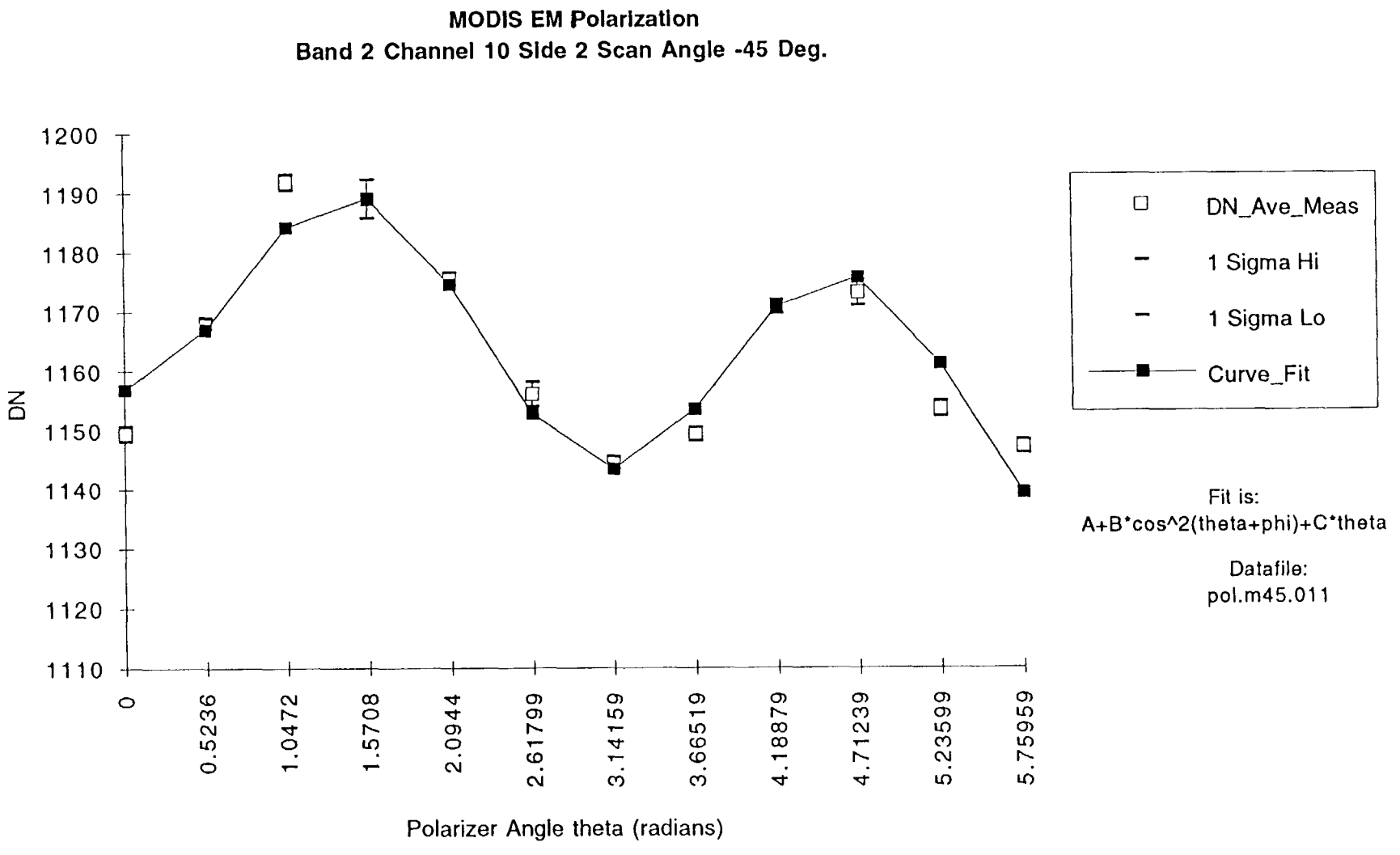
CAVEATS: DATA TAKEN UNDER NON-OPTIMUM CONDITIONS
GSFC HAS CONCERNS ABOUT CURVE FITS
NOT ALL FEATURES HAVE BEEN EXAMINED YET

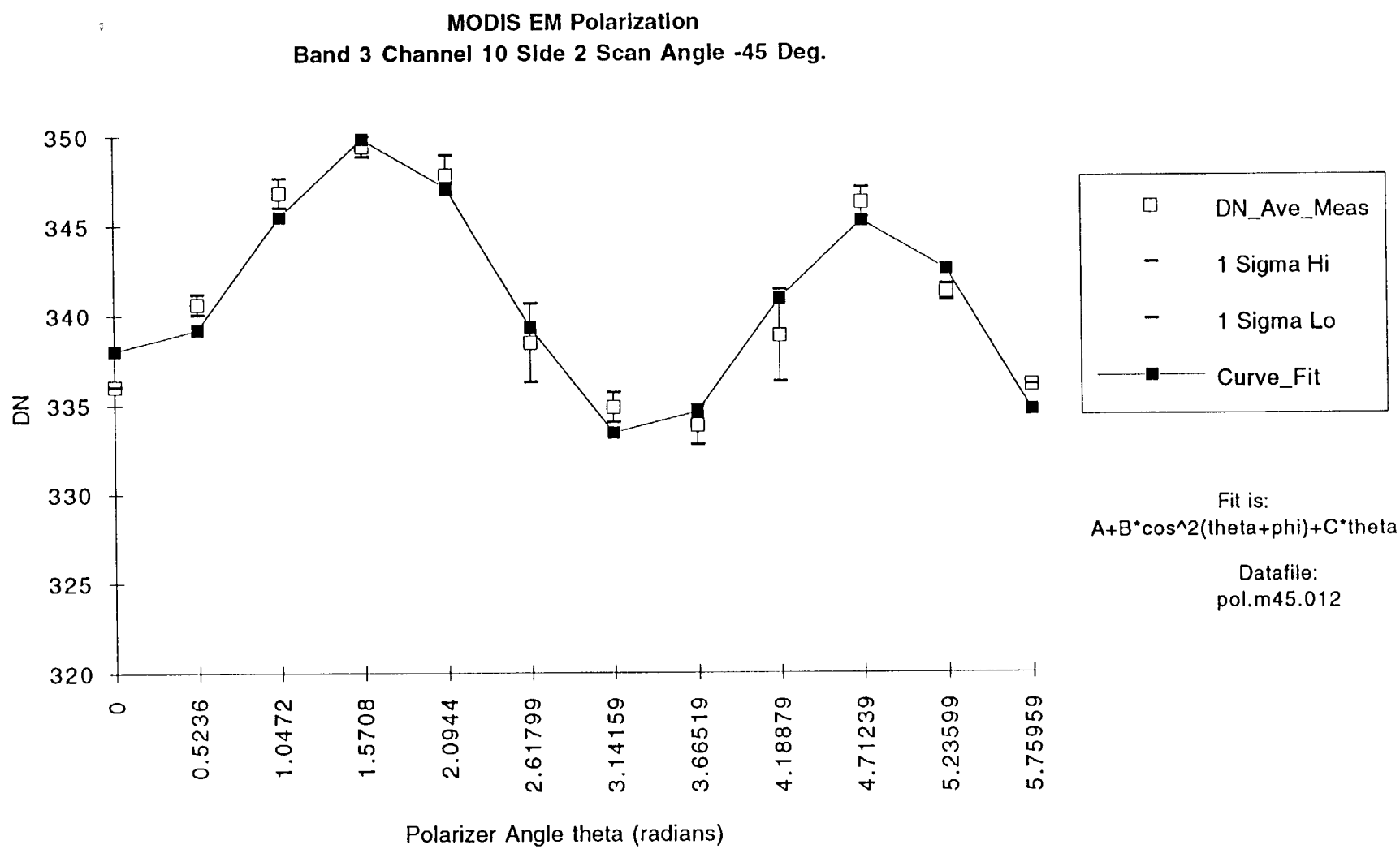


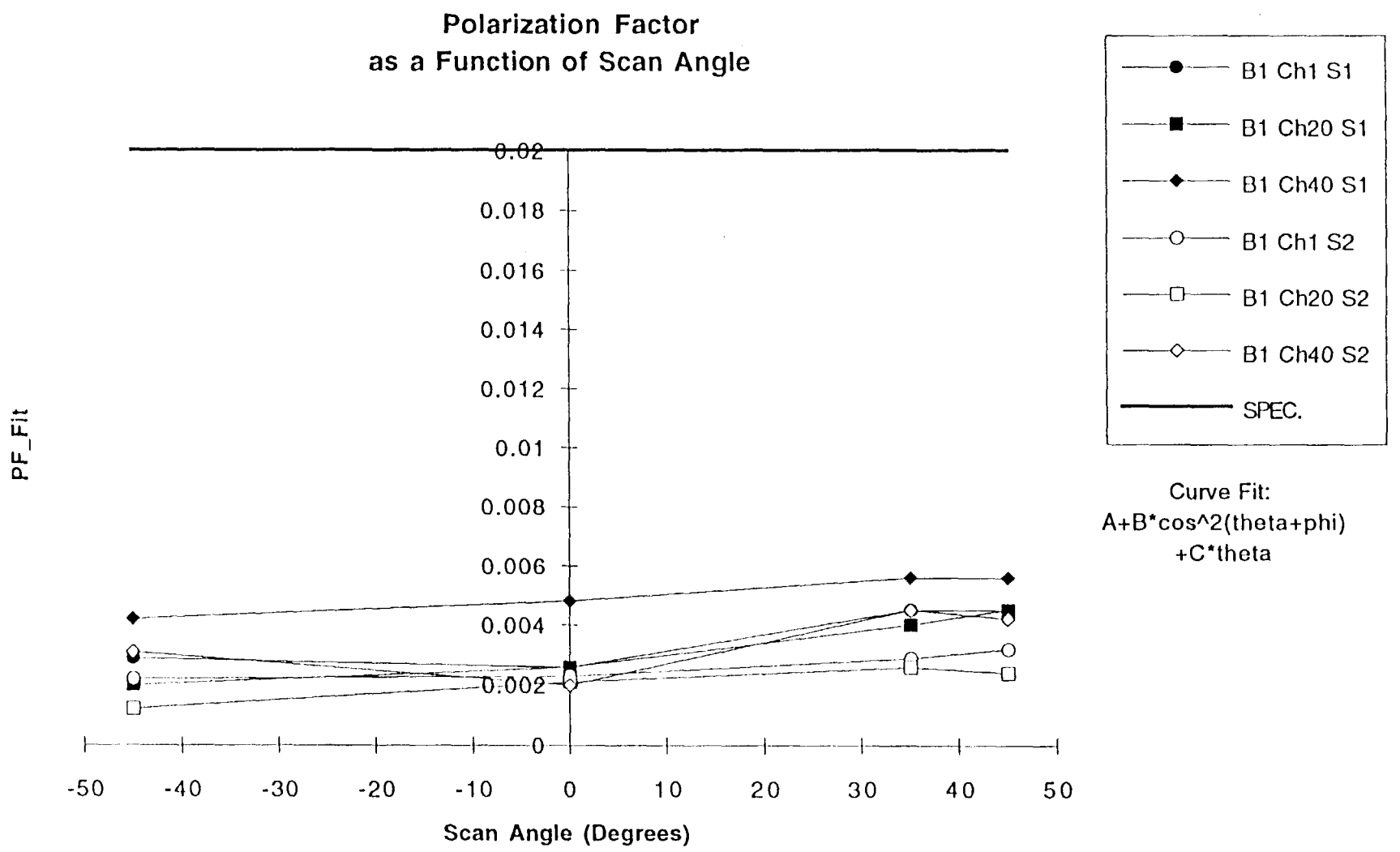
MCST/Knight/Zukowski

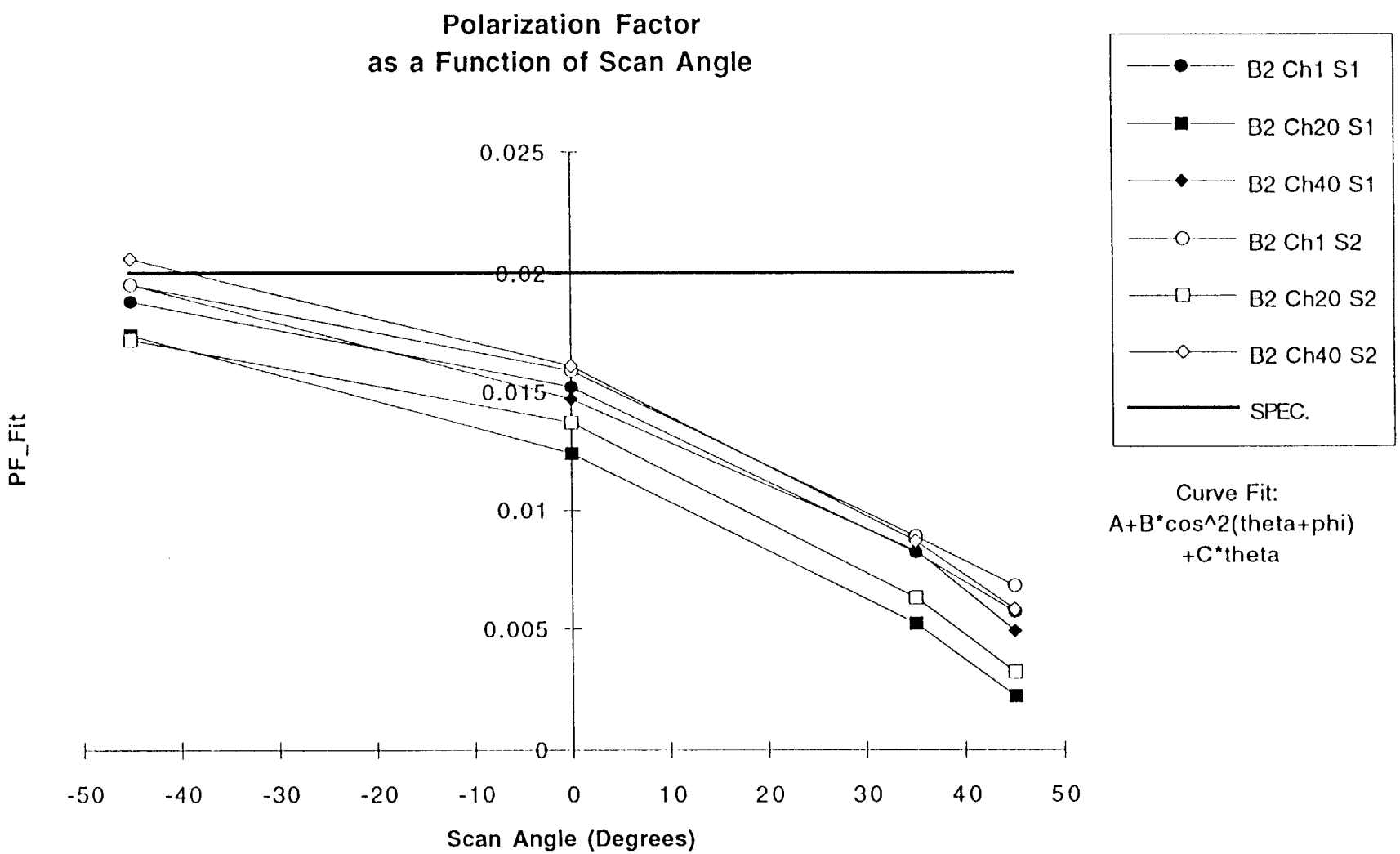
FIGURE 2

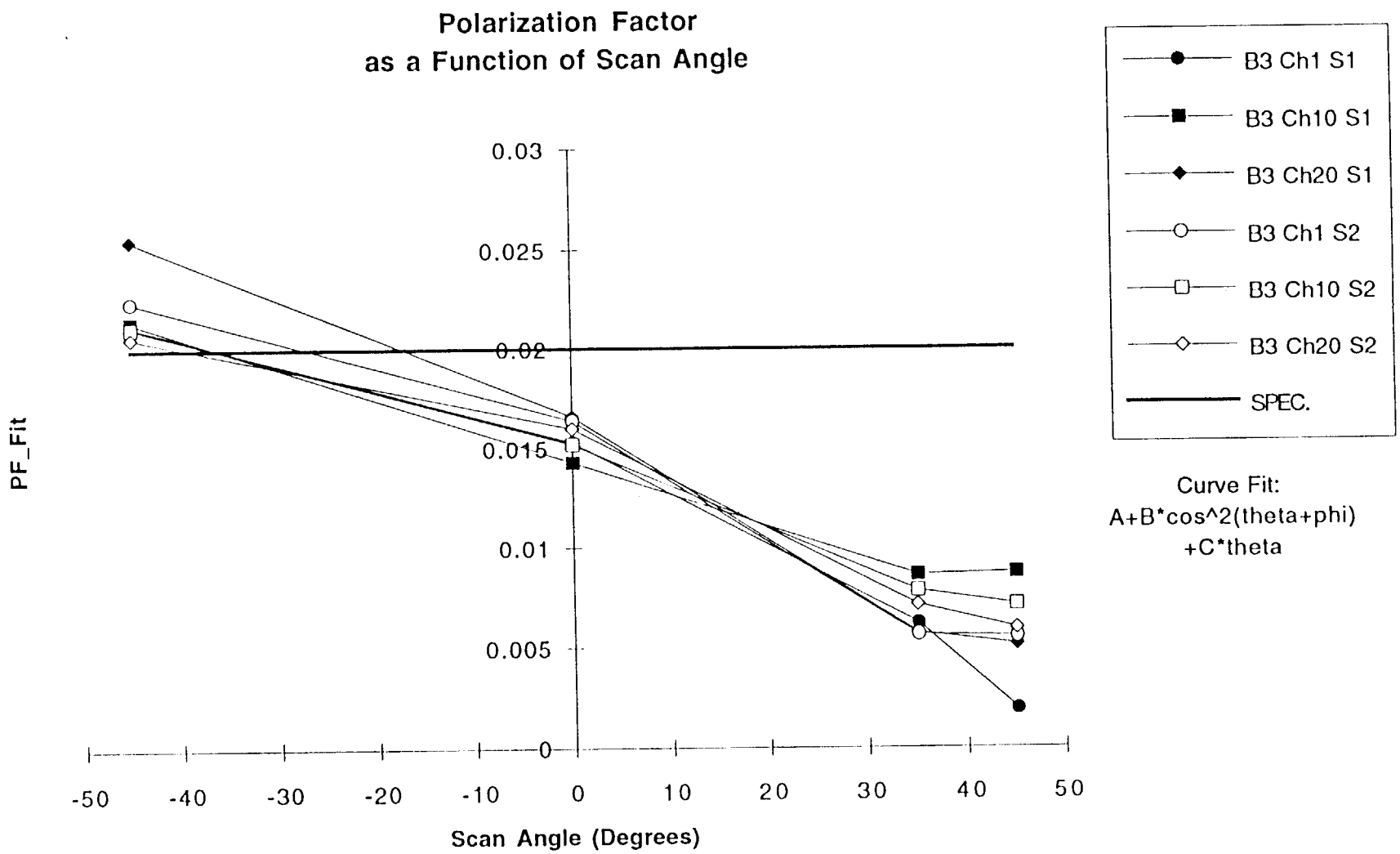
3/15/95 pol.plots.tpl1 Chart 1

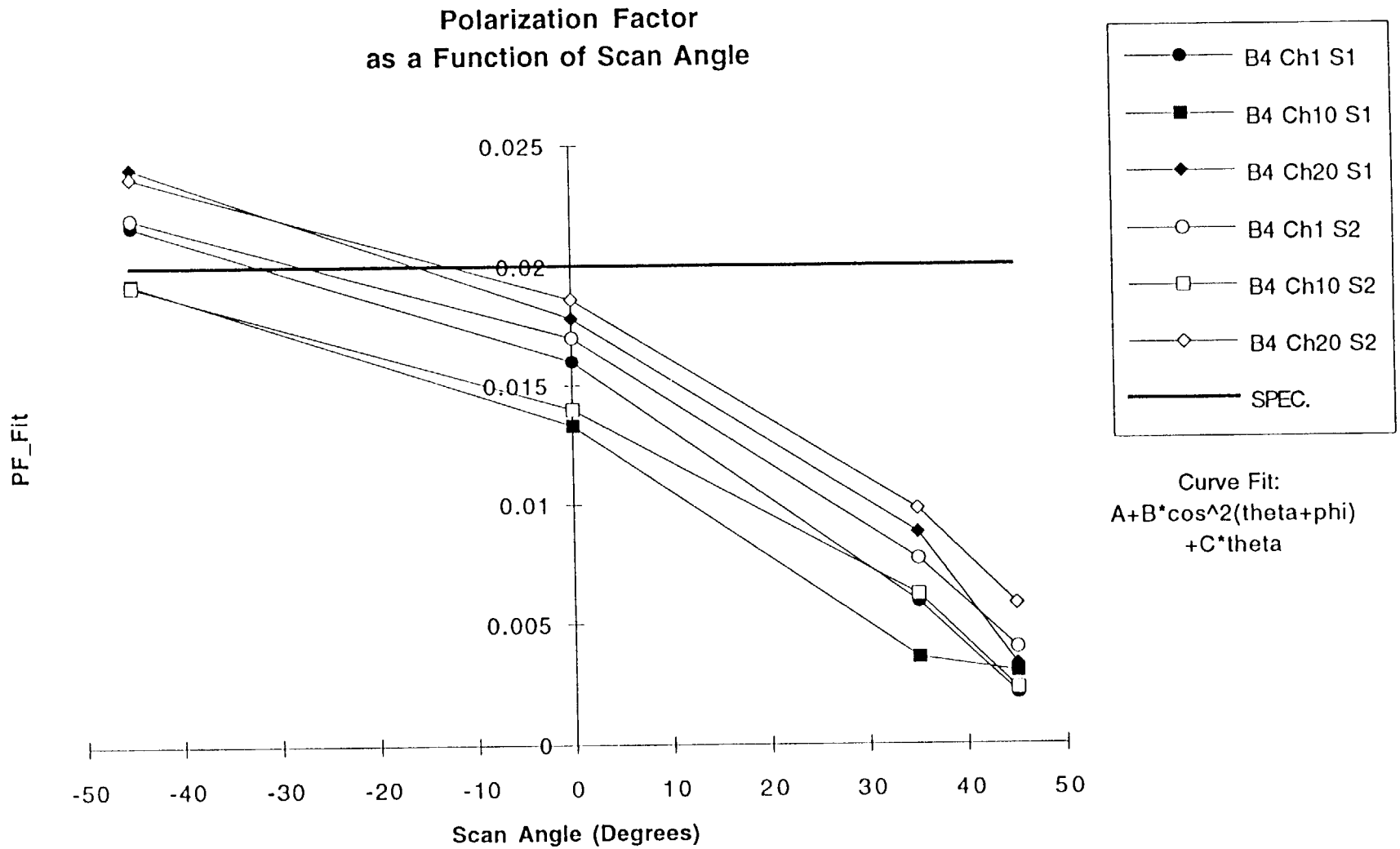

MODIS EM Polarization
Band 2 Channel 10 Side 2 Scan Angle -45 Deg.
DN
1200
1190
1180
1170
1160
1150
1140
1130
1120
1110
0
0.5236
1.0472
1.5708
2.0944
2.61799
3.14159
3.66519
4.18879
4.71239
5.23599
5.75959
Polarizer Angle theta (radians)
DN_Ave_Meas
1 Sigma Hi
1 Sigma Lo
Curve_Fit
Fit is:
A+B*cos^2(theta+phi)+C*theta
Datafile:
pol.m45.011

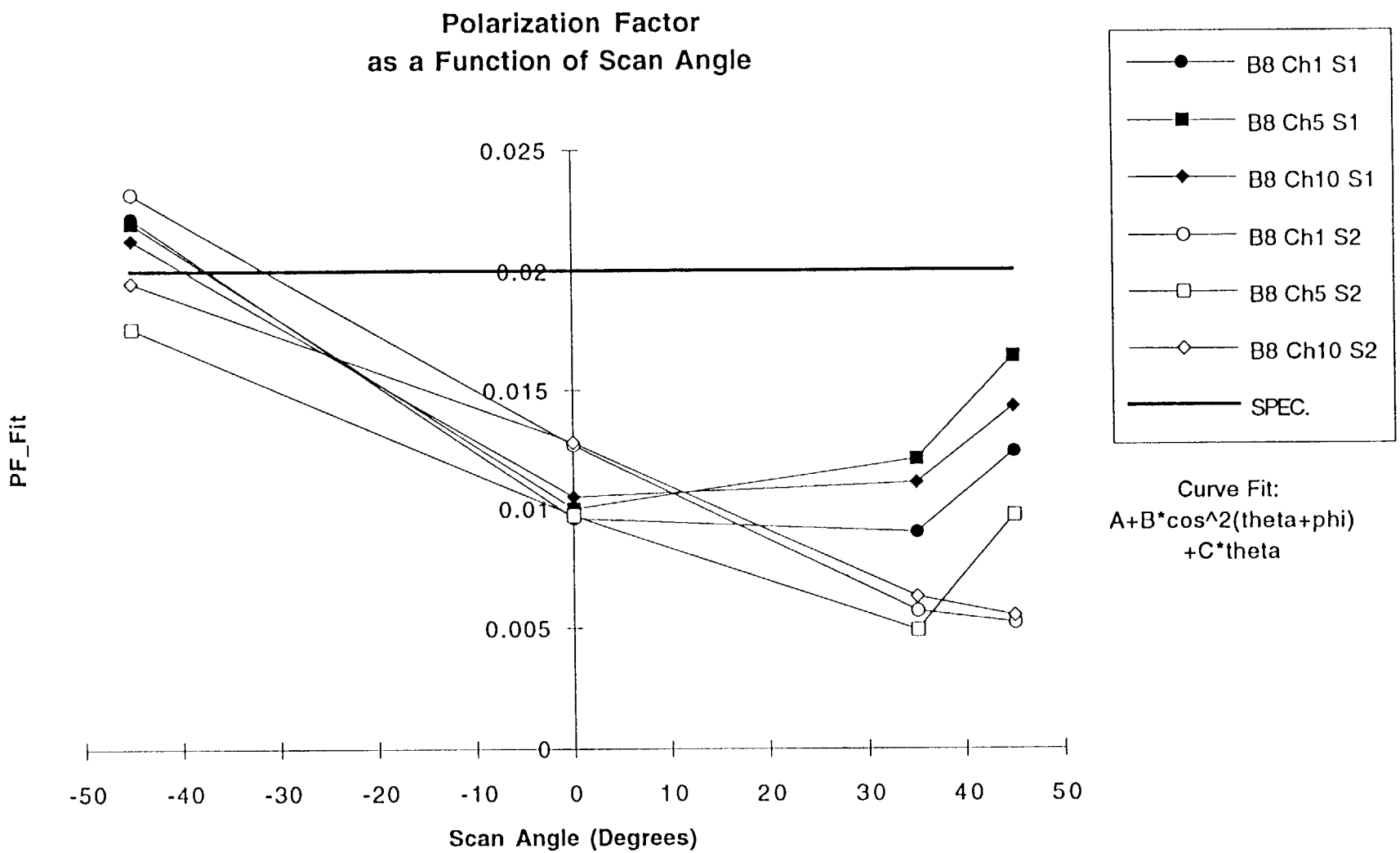

MODIS EM Polarization
Band 3 Channel 10 Side 2 Scan Angle -45 Deg.
DN
350
345
340
335
330
325
320
0
0.5236
1.0472
1.5708
2.0944
2.61799
3.14159
3.66519
4.18879
4.71239
5.23599
5.75959
Polarizer Angle theta (radians)
DN_Ave_Meas
1 Sigma Hi
1 Sigma Lo
Curve_Fit
Fit is:
A+B*cos^2(theta+phi)+C*theta
Datafile:
pol.m45.012


Polarization Factor
as a Function of Scan Angle
PF_Fit
0.02
0.018
0.016
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
-50
-40
-30
-20
-10
0
10
20
30
40
50
Scan Angle (Degrees)
B1 Ch1 S1
B1 Ch20 S1
B1 Ch40 S1
B1 Ch1 S2
B1 Ch20 S2
B1 Ch40 S2
SPEC.
Curve Fit:
A+B*cos^2(theta+phi)
+C*theta


Polarization Factor
as a Function of Scan Angle
PF_Fit
0.025
0.02
0.015
0.01
0.005
0
-50
-40
-30
-20
-10
0
10
20
30
40
50
Scan Angle (Degrees)
B2 Ch1 S1
B2 Ch20 S1
B2 Ch40 S1
B2 Ch1 S2
B2 Ch20 S2
B2 Ch40 S2
SPEC.
Curve Fit:
A+B*cos^2(theta+phi)
+C*theta


Polarization Factor
as a Function of Scan Angle
PF_Fit
0.03
0.025
0.02
0.015
0.01
0.005
0
-50
-40
-30
-20
-10
0
10
20
30
40
50
Scan Angle (Degrees)
B3 Ch1 S1
B3 Ch10 S1
B3 Ch20 S1
B3 Ch1 S2
B3 Ch10 S2
B3 Ch20 S2
SPEC.
Curve Fit:
A+B*cos^2(theta+phi)
+C*theta


Polarization Factor
as a Function of Scan Angle
PF_Fit
0.025
0.02
0.015
0.01
0.005
0
-50
-40
-30
-20
-10
0
10
20
30
40
50
Scan Angle (Degrees)
B4 Ch1 S1
B4 Ch10 S1
B4 Ch20 S1
B4 Ch1 S2
B4 Ch10 S2
B4 Ch20 S2
SPEC.
Curve Fit:
A+B*cos^2(theta+phi)
+C*theta


Polarization Factor
as a Function of Scan Angle
PF_Fit
0.025
0.02
0.015
0.01
0.005
0
-50
-40
-30
-20
-10
0
10
20
30
40
50
Scan Angle (Degrees)
B8 Ch1 S1
B8 Ch5 S1
B8 Ch10 S1
B8 Ch1 S2
B8 Ch5 S2
B8 Ch10 S2
SPEC.
Curve Fit:
A+B*cos^2(theta+phi)
+C*theta