

Attachment B

# TOTAL AND SPECTRAL SOLAR IRRADIANCE

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## 1. SOLAR TOTAL IRRADIANCE (SOLAR CONSTANT)

- RECENT SPACECRAFT OBSERVATIONS
- TOTAL IRRADIANCE VARIATIONS  
SHORT TERM VARIATIONS (DAYS)  
11-YEAR VARIABILITY

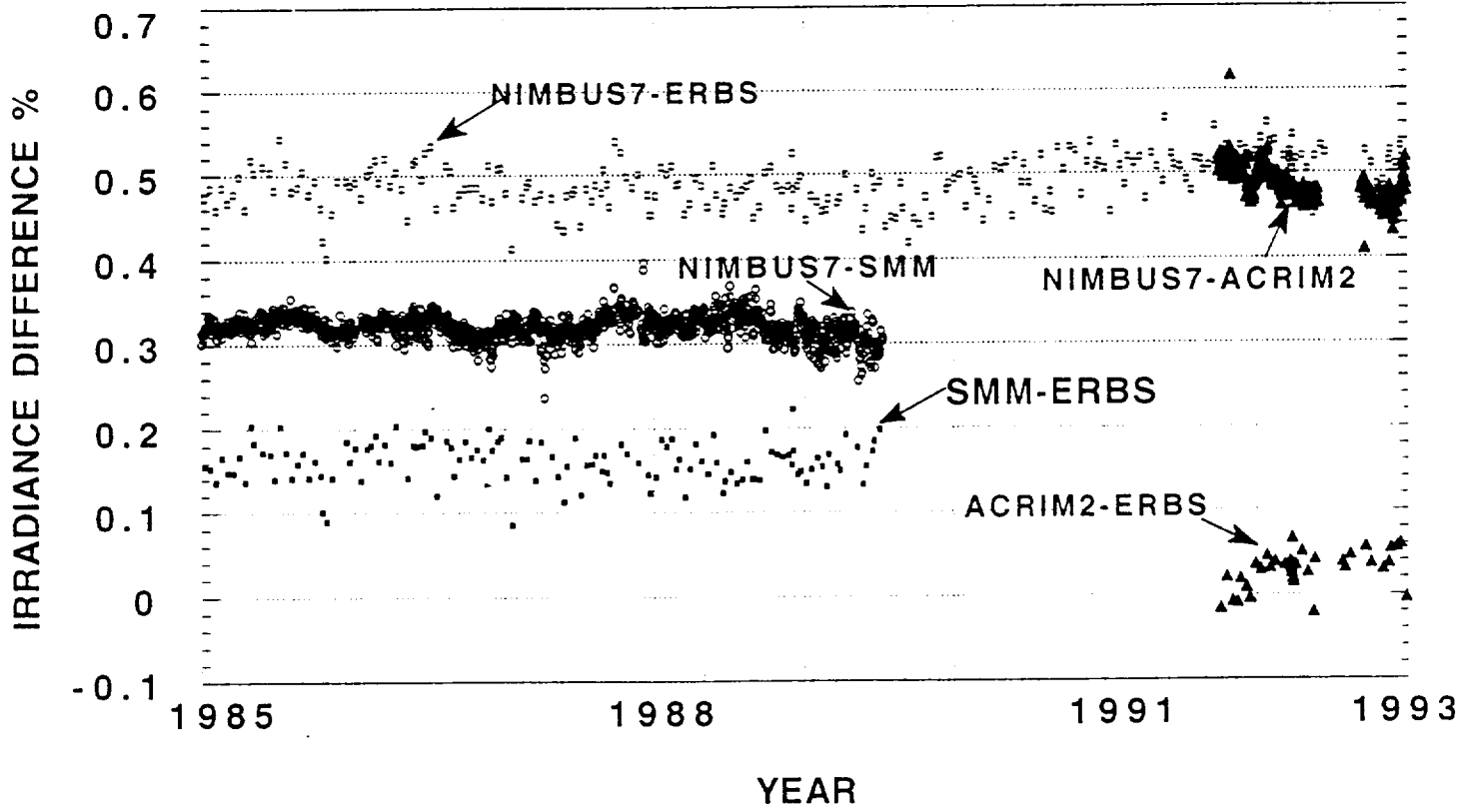
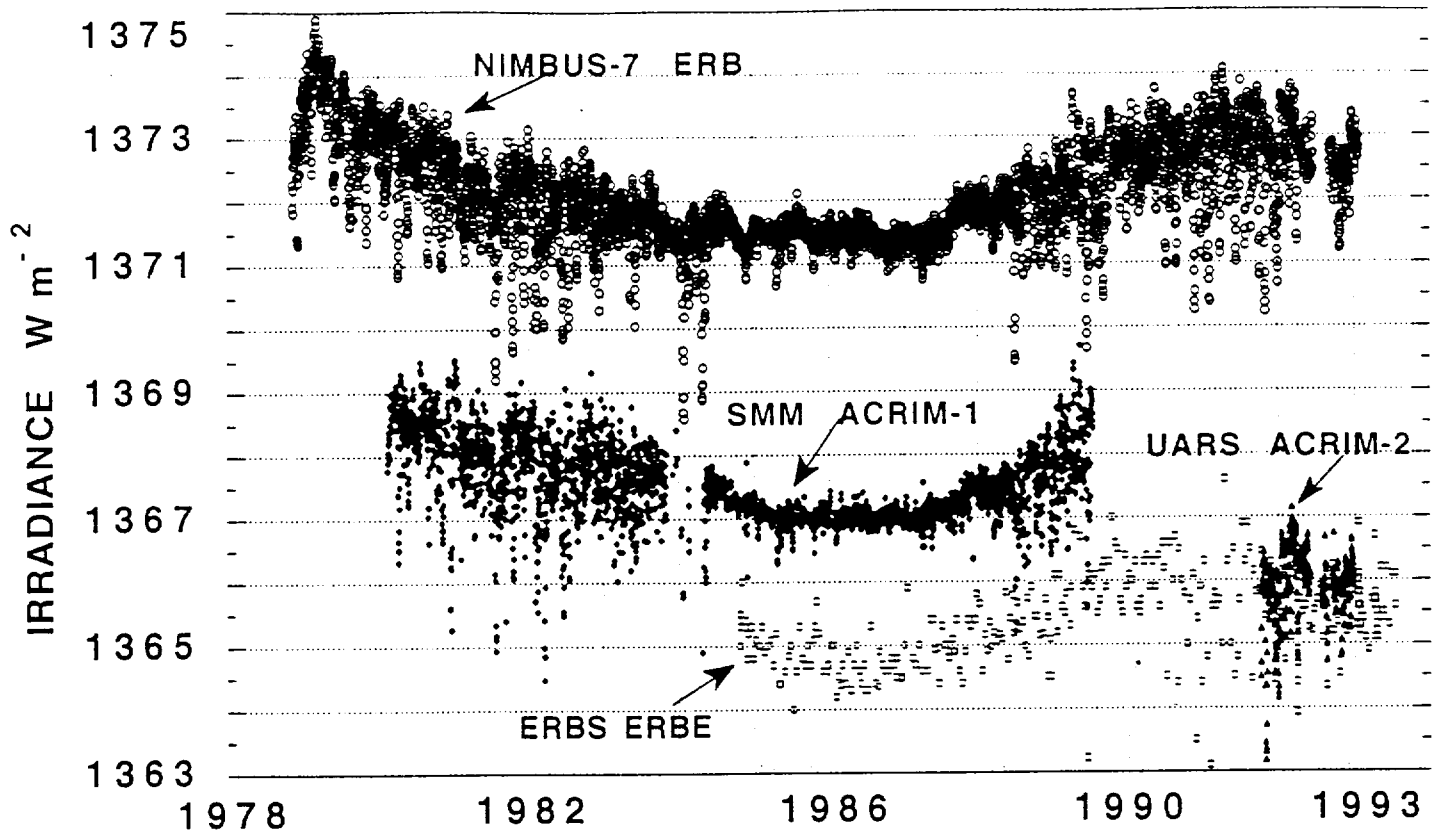
## 2. SOLAR SPECTRAL IRRADIANCE

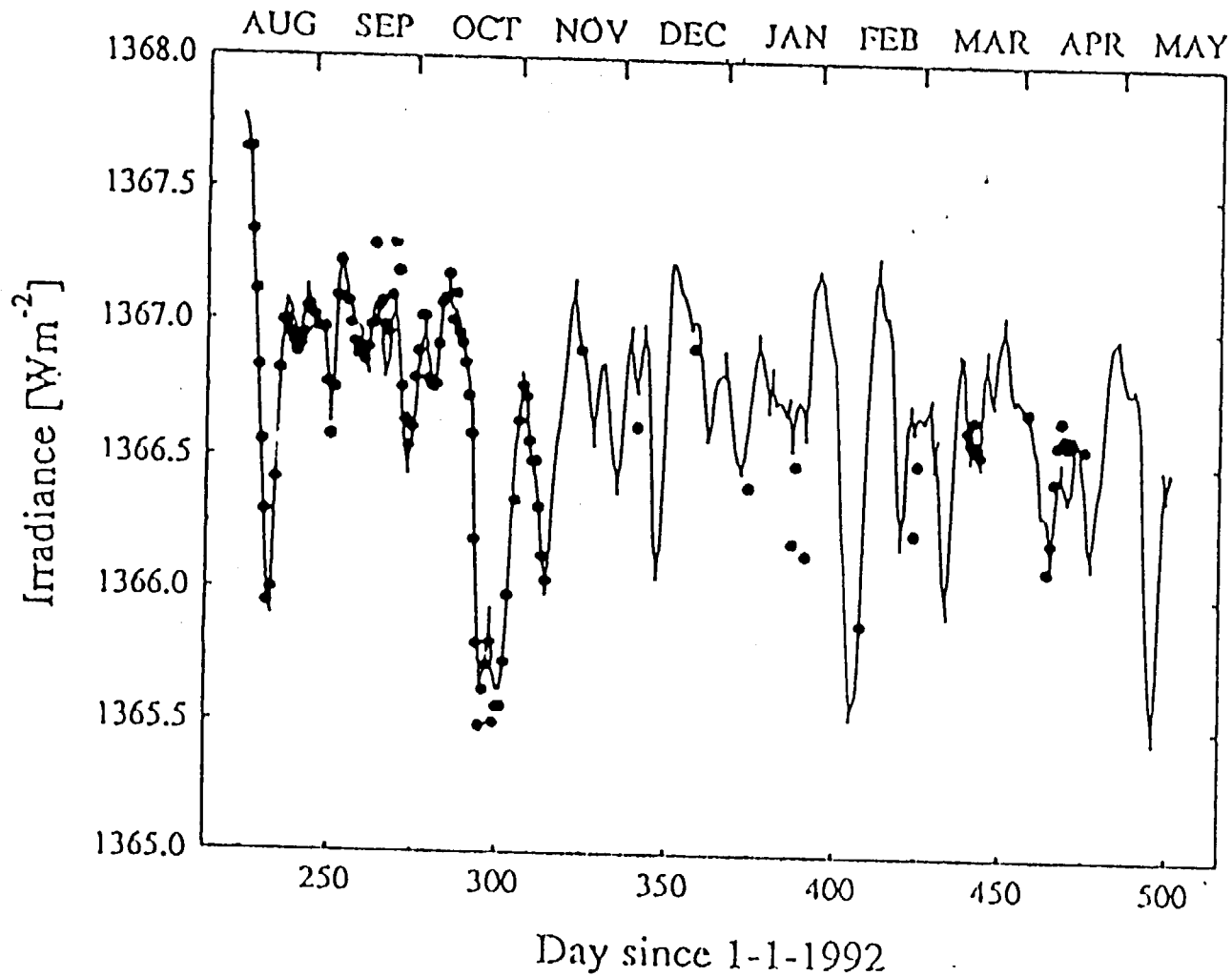
- SPECTRAL IRRADIANCE VARIABILITY  
ULTRAVIOLET  
FRAUNHOFER LINE
- VARIATIONS IN THE VISIBLE AND IR
- RECENT SPACECRAFT MEASUREMENTS
- DATA AVAILABLE - AT PRESENT

## 3. SUMMARY AND RECOMMENDATION

## SOLAR TOTAL IRRADIANCE-SPACECRAFT OBSERVATIONS

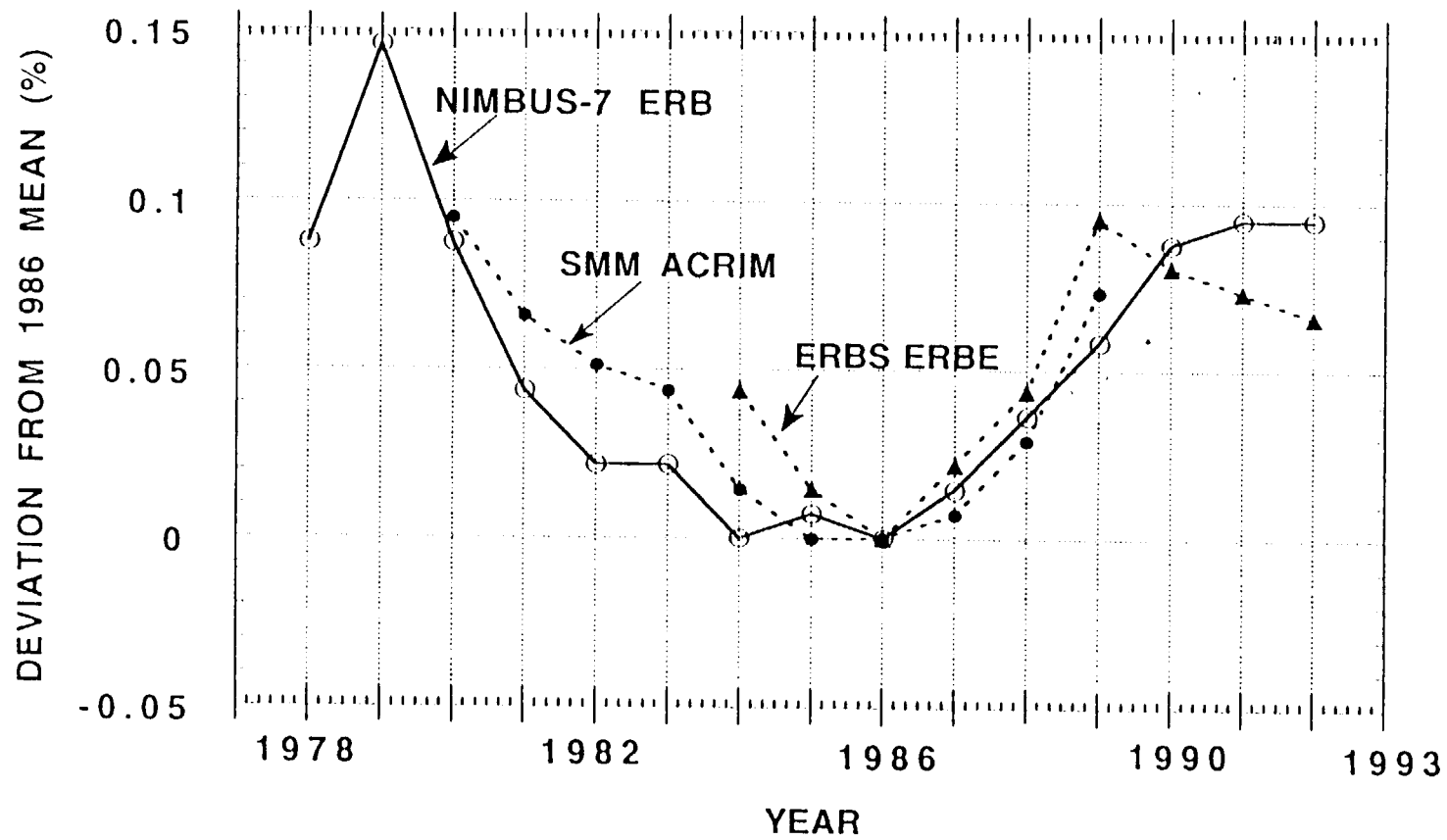
SPACECRAFT	RADIOMETER/ABSOLUTE ACCURACY	OBSERVATION PERIOD
NIMBUS-7	HICKEY-FRIEDEN (H-F) / 0.5%	NOV.1978- JAN 1993
SMM	ACRIM-1 (ACR 0.2%)	FEB.1980-JULY 1989
ERBS	ERBE (ACR 0.2%)	OCT.1984-PRESENT
UARS	ACRIM-2 (ACR 0.2%)	OCT.1991-PRESENT
EURECA	SOVA-1 (CROM) SOVA-2 (PM06)	AUG 10,'92-MAY 16,'93
<b>SPACE SHUTTLE</b>		
ATLAS-1 & ATLAS-2	ACR & SOLCON	23 MARCH-2 APRIL 1992  March 1993

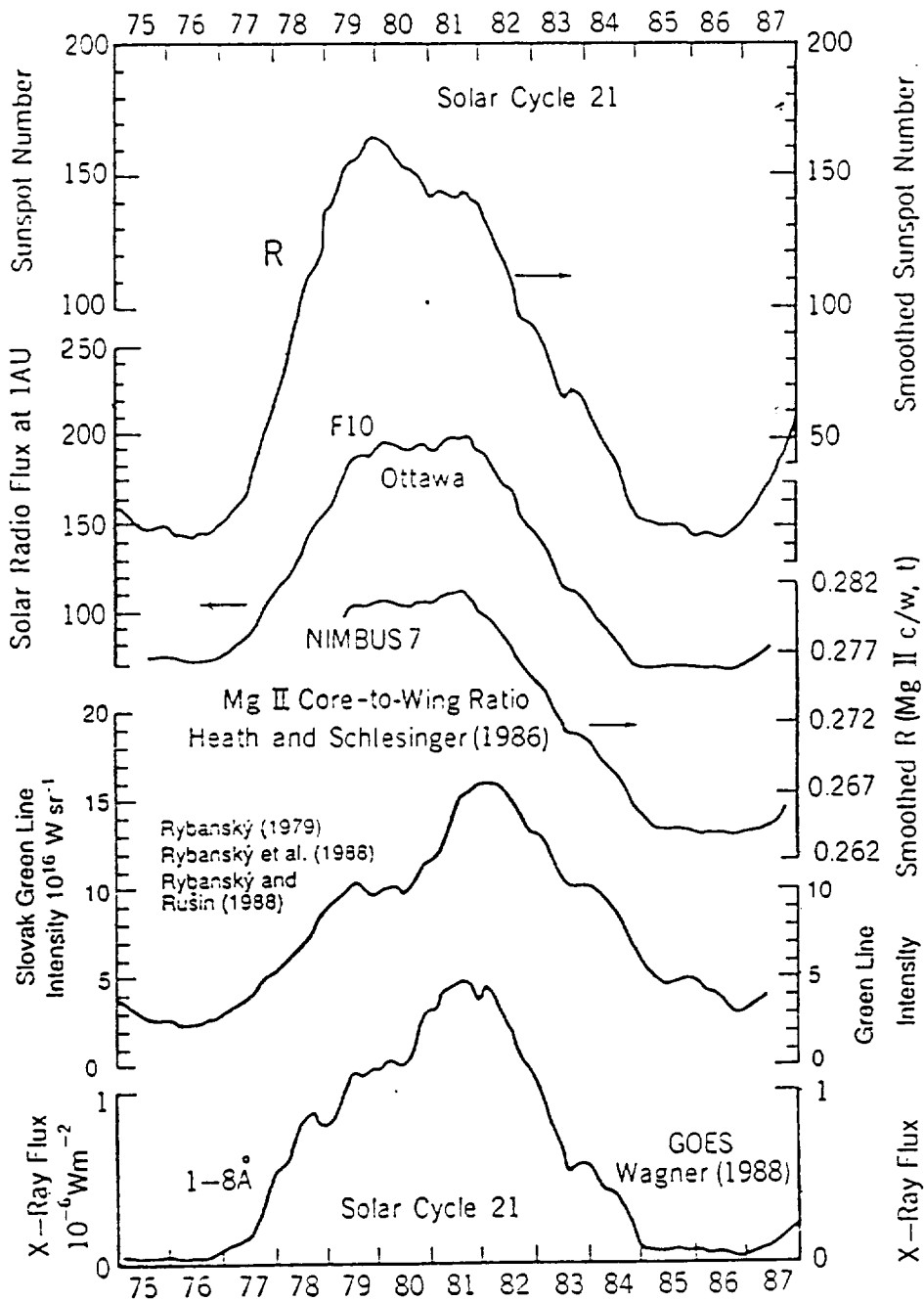




Daily mean values of the total solar irradiance during the EURECA mission as measured by the 'active' (continuous line) and 'back-up' (dots) radiometers of SOVA 2.

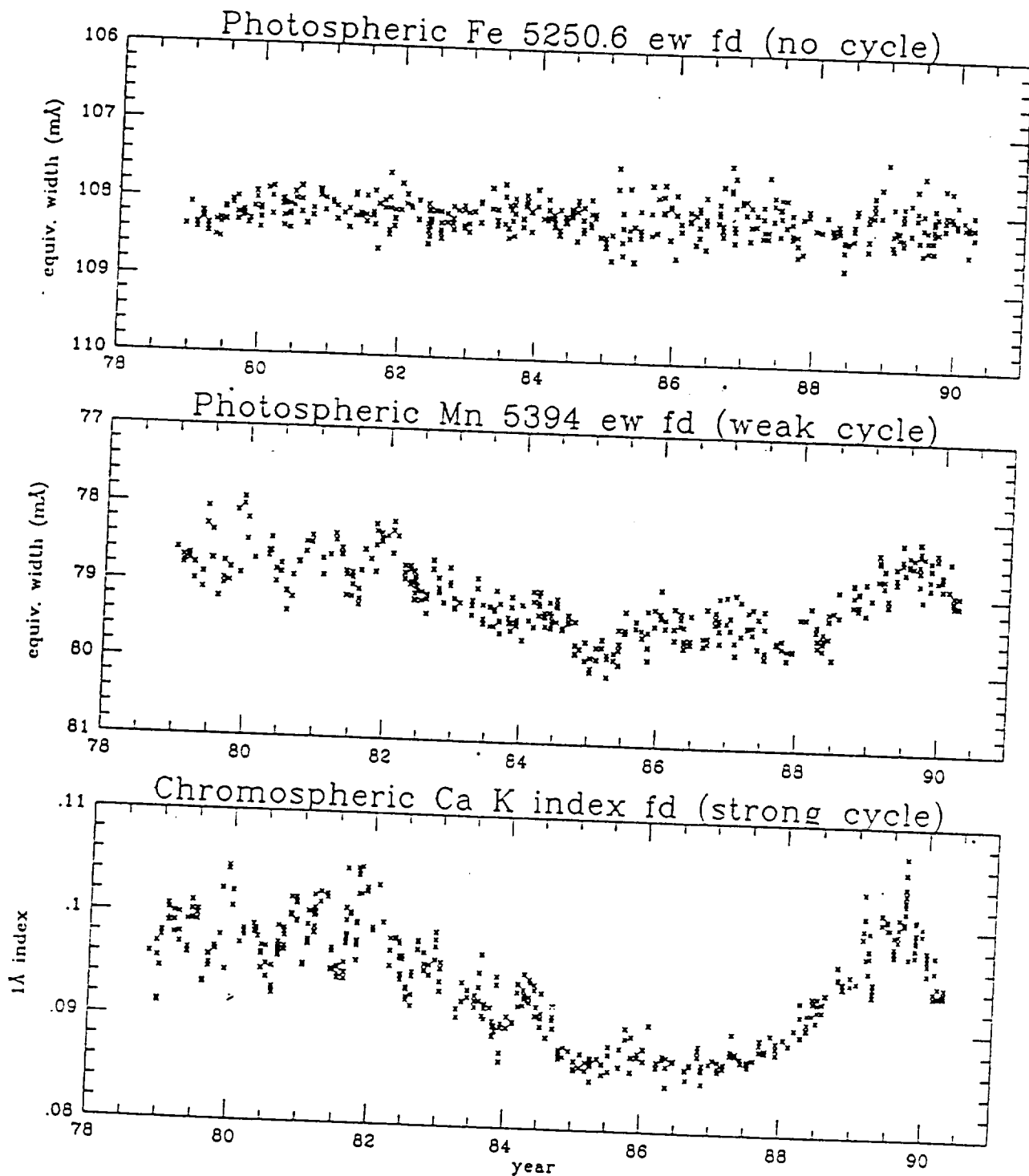
Solar Physics 152: 23-29, 1994





Smoothed solar cycle 21 variations for the photospheric sunspot number, F10 solar radio flux, chromospheric MgII core-to-wing ratio, coronal green-line effective intensity (CI), and the very hot and active coronal 1-8 Å flux. The 10.7 cm solar radio flux units (sfu) are  $10^{-22} \text{ W m}^{-2} \text{ Hz}^{-1}$  (Donnelly, 1990).

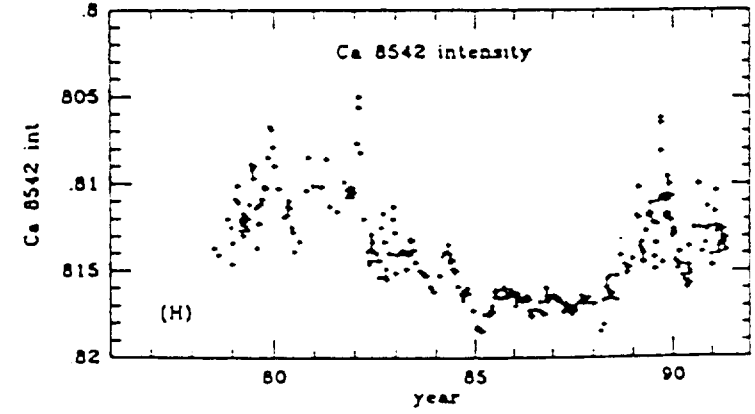
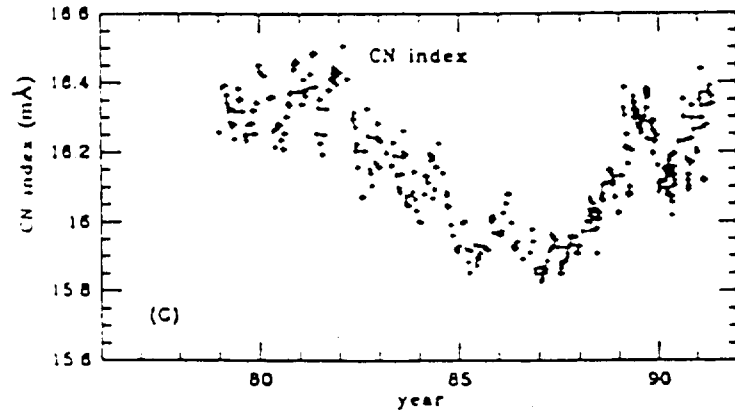
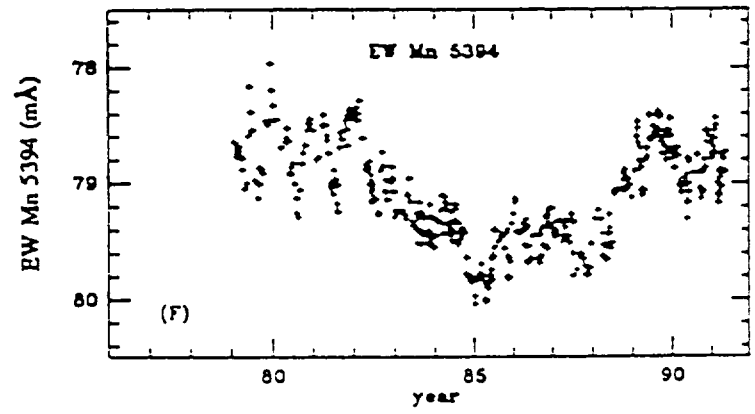
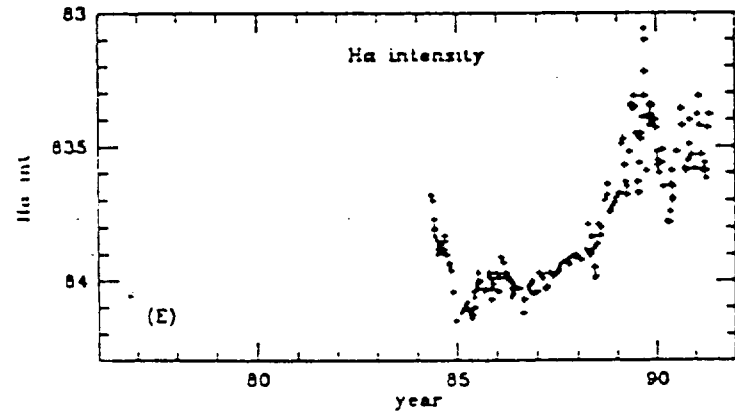
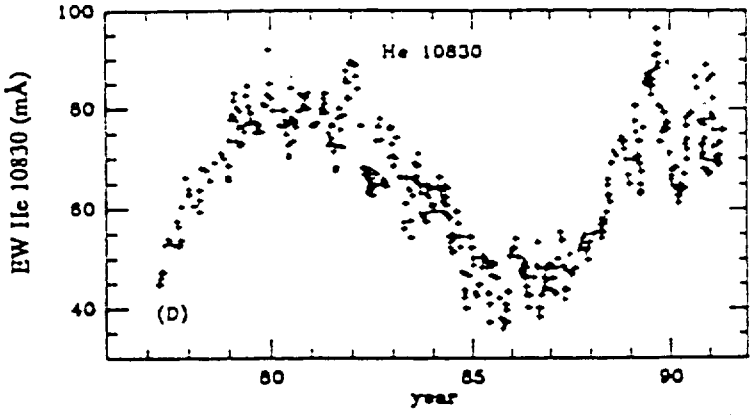
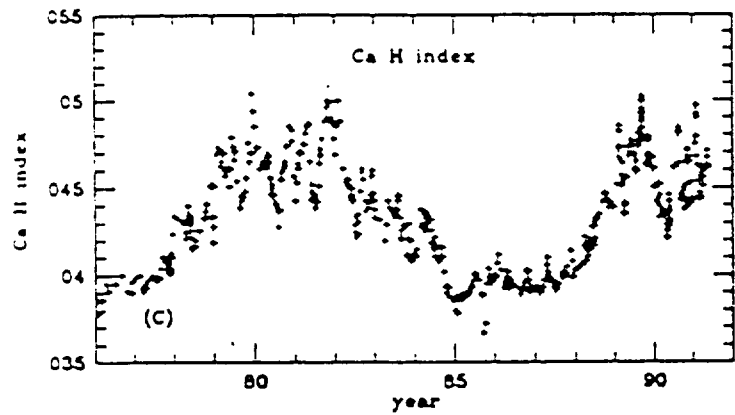
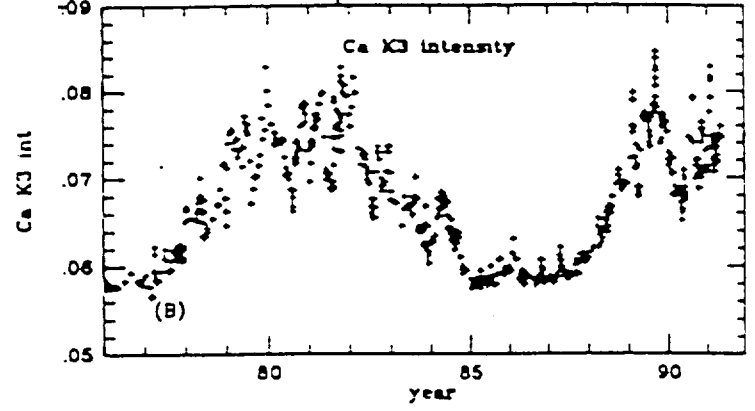
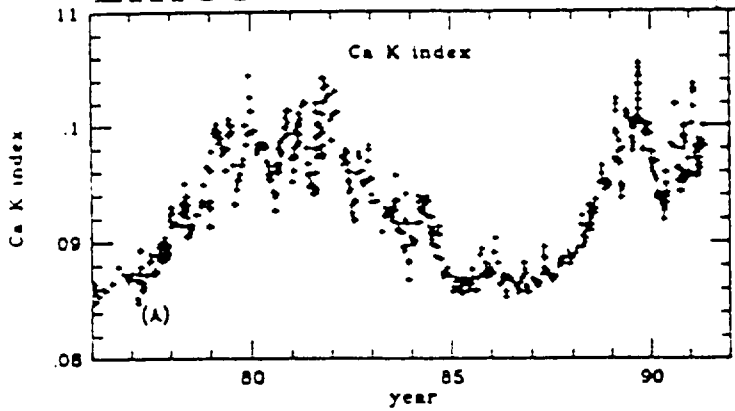
*Proceedings of the Workshop on the Solar Electromagnetic Radiation Study for Solar Cycle 22 p. 177*



Examples of solar cycle behavior of selected lines in Fig. 1. The Mn 5394 plot is inverted to agree in sense with Ca K.

Livingston W.C. 1990 NASA CP p. 336 - 340.

# Lines with a strong cycle response



Time series for lines which respond strongly to solar cycle activity.





**DATA AVAILABLE - AT PRESENT**

1. **H.NECKEL AND D. LABS, THE SOLAR RADIATION BETWEEN 3300-12500 A,  
SOLAR PHYSICS, 90 (1984), 205**
2. **A.Keith Pierce, R.G.ALLEN, The SOLAR SPECTRUM BETWEEN  
0.3 AND 10  $\mu$ m, IN SOLAR OUTPUT AND ITS VARIATION,  
EDITED BY O.R.WHITE , COLORADO ASSOCIATED UNIVERSITY PRESS 1977**

## **SUMMARY AND RECOMMENDATION**

### **SOLAR ELECTROMAGNETIC RADIATION STUDY FOR SOLAR CYCLE 22(SOLERS22)**

- **INTERNATIONAL PROGRAM FOR COLLABORATIVE RESEARCH**

#### **MAIN GOAL, TO DETERMINE:**

- **THE DAILY FLUX VALUES OF TOTAL SOLAR IRRADIANCE**
- **SOLAR SPECTRAL IRRADIANCE IN THE IR, VISIBLE UV, EUV, X-RAY WAVELENGTH RANGES FOR SOLAR CYCLE 22**

#### **FOR USE IN RESEARCH OF THE TERRESTRIAL EFFECTS OF SOLAR ACTIVITY**

**RECOMMEND: THE DATA AVAILABLE IN THE LITERATURE- FOR THE PRESENT**