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(NASA-CR-200302) NOAA-11 SBUV/2
MEASUREMENTS OF SOLAR UV VARIATIONS
(NASA, Goddard Space Flight Center)
10 p

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NOAA-11 SBUV/2 Measurements of Solar UV Variations

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The SBUV/2 instrument onboard the NOAA-11 satellite made daily solar spectral irradiance measurements in the wavelength region 160-405 nm at 1.1 nm resolution between January 1989 and October 1994. These observations continued the uninterrupted series of solar measurements begun by the Nimbus-7 SBUV in 1978 and continued by NOAA-9 SBUV/2. While the measurements made by the SBUV-series instruments furnish an excellent data base for studies of solar UV variability, these instruments do not have an internal means to evaluate and correct for long-term instrument sensitivity degradation, needed to evaluate solar cycle timescale irradiance change.

During yearly Shuttle flights the Shuttle SBUV (SSBUV) also performs solar spectral irradiance measurements in the wavelength region 200 to 400 nm with an instrument that is calibrated preflight, inflight, and postflight. Comparisons between the simultaneous NOAA-11 SBUV/2 and SSBUV solar measurements are used to identify and correct long-term sensitivity changes in the satellite instrument. The NOAA-11 data will then be used to evaluate long-term solar change. We present a progress report on the above process. At this preliminary stage uncertainties in the calibration transfer between SSBUV and NOAA-11 SBUV/2 are too large to accurately evaluate long-term solar change near the A1 edge, but solar rotational activity variations can be evaluated. We find that rotational activity declined from roughly 6% peak-to-peak (p-p) near the maximum of solar cycle 22 in 1989-1991 to approximately 3% p-p in mid 1992 and 2% p-p by mid 1994. Emphasizing rotational variations, comparisons between the 200 nm data and the NOAA-11 Mg II proxy index are presented.

1. 1995 Spring Meeting
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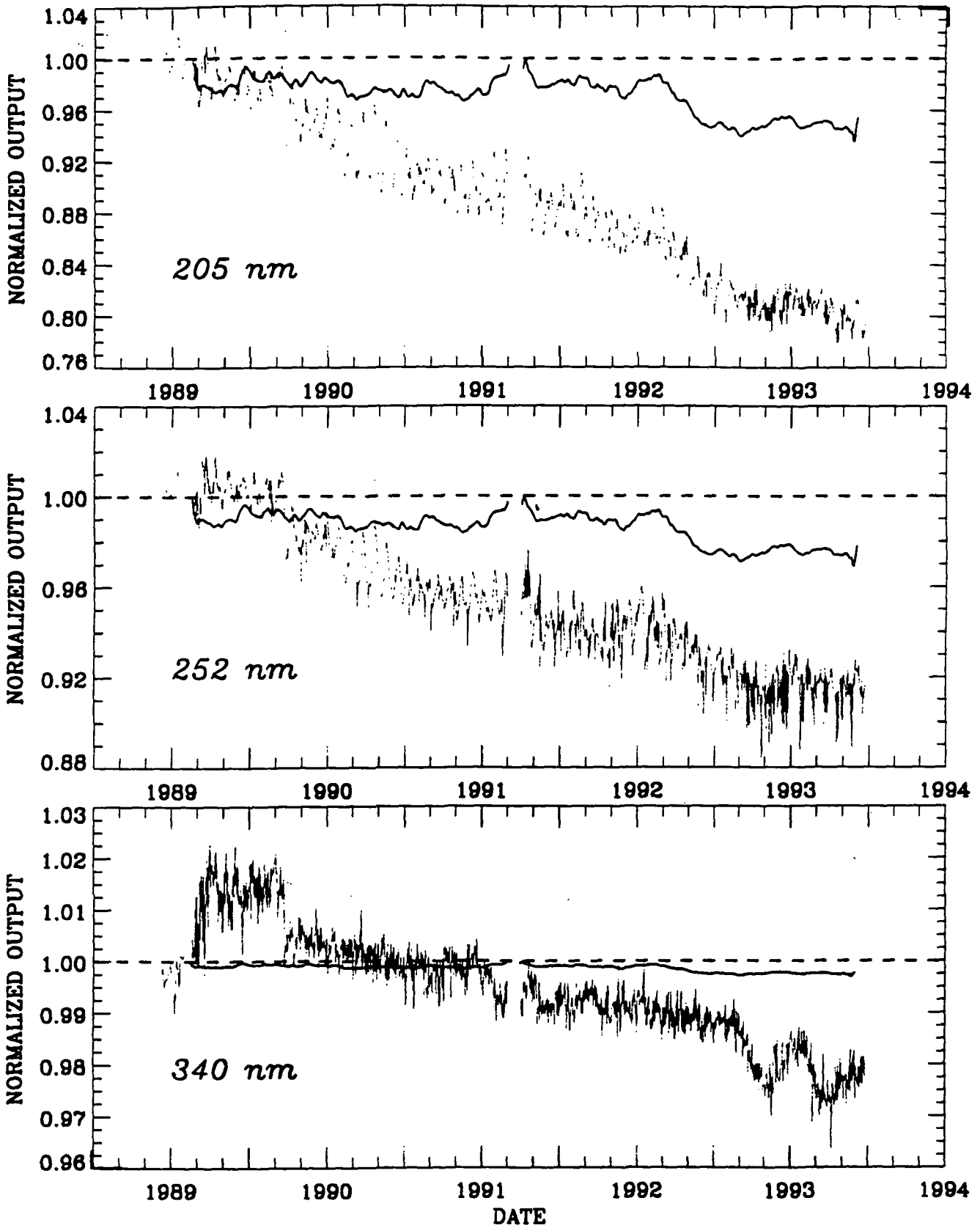
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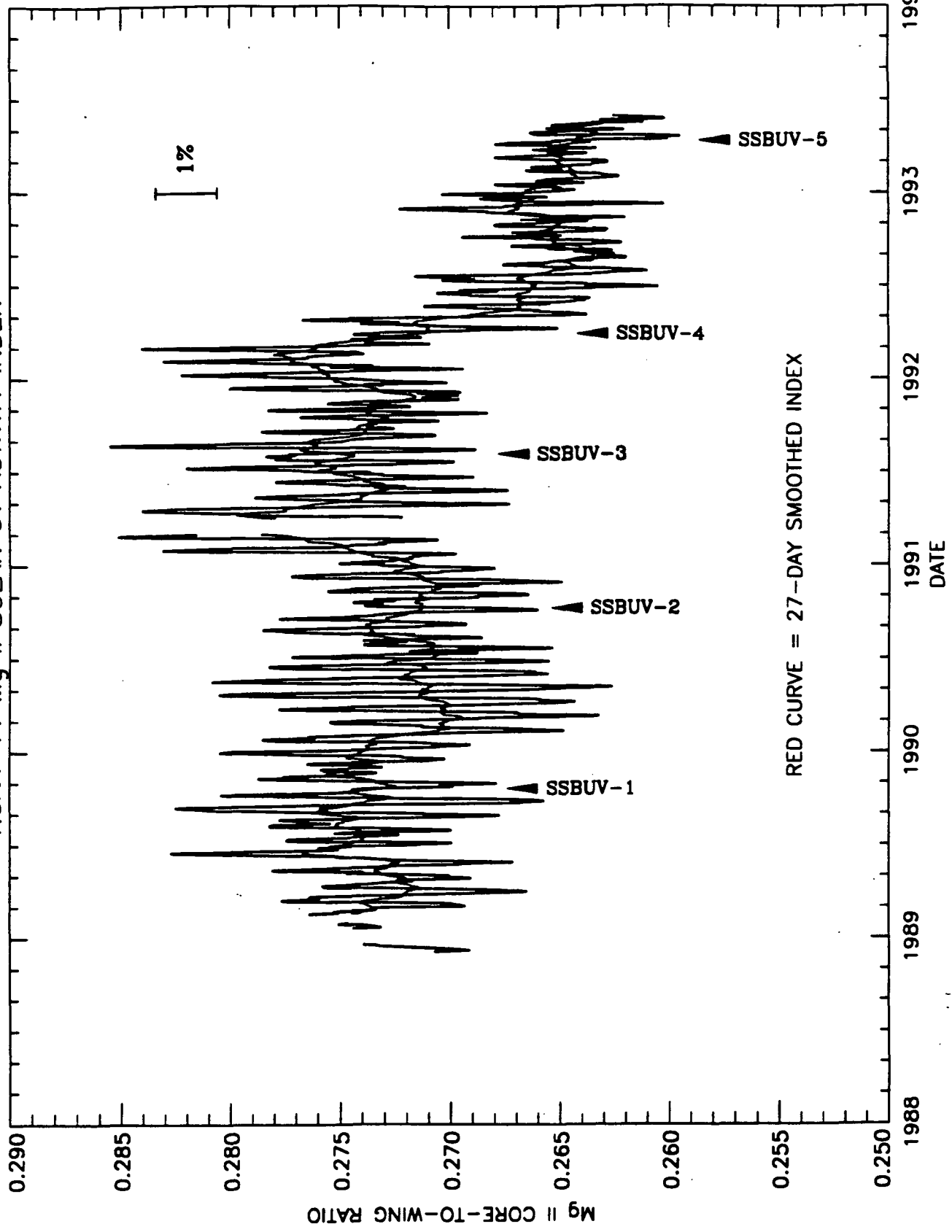
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4. SH
5. (a) SH02 Radiative Inputs of the Sun to the Earth

(b) 7549 Ultraviolet emissions
7594 Instruments and
techniques
0340 Middle atmosphere
composition and chemistry
6. Oral preferred
7. None
8. Charge \$50 to credit card
information on attached sheet
9. C
10. None
11. No

NOAA-11 SOLAR DATA



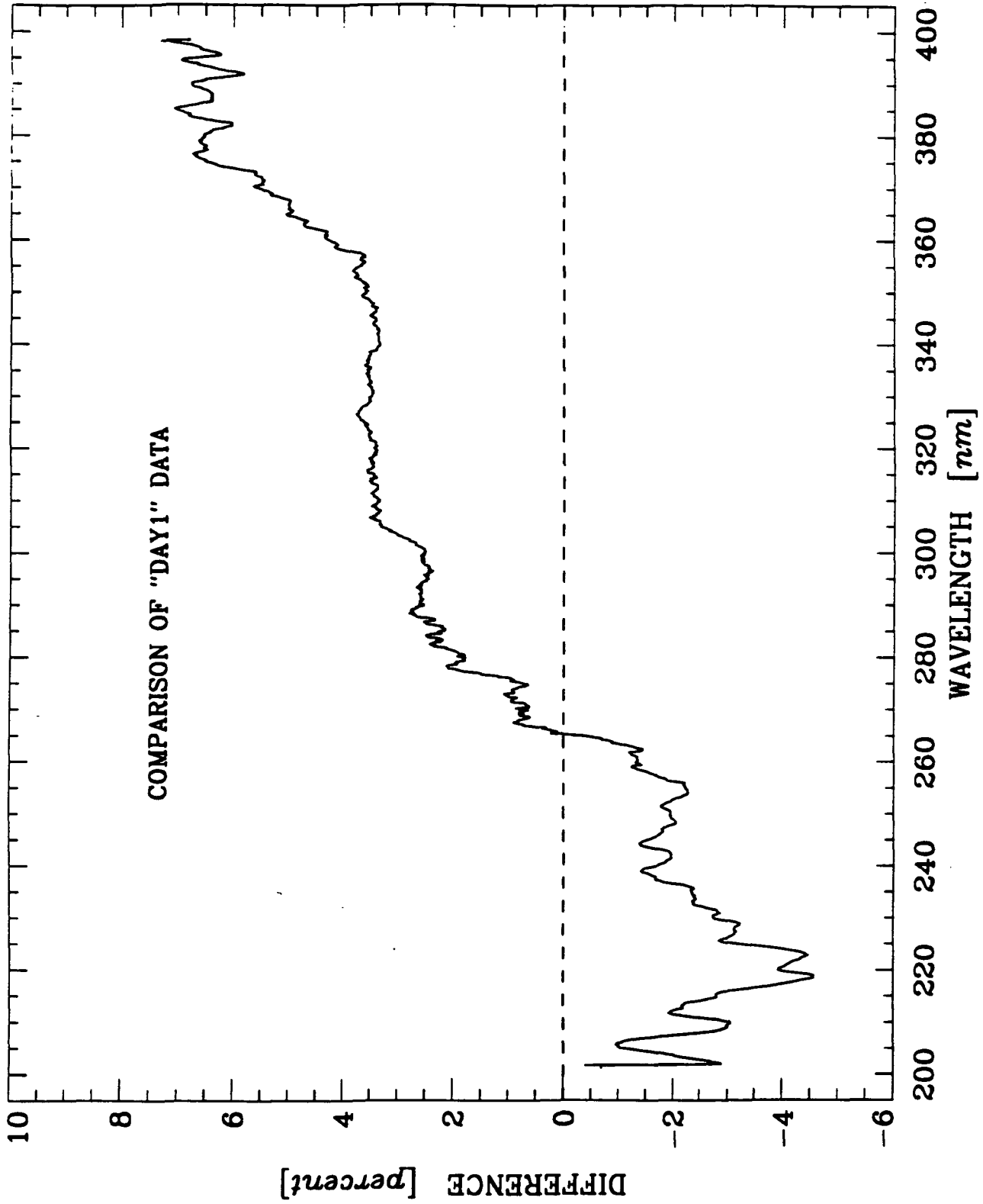
NOAA-11 Mg II SOLAR UV ACTIVITY INDEX



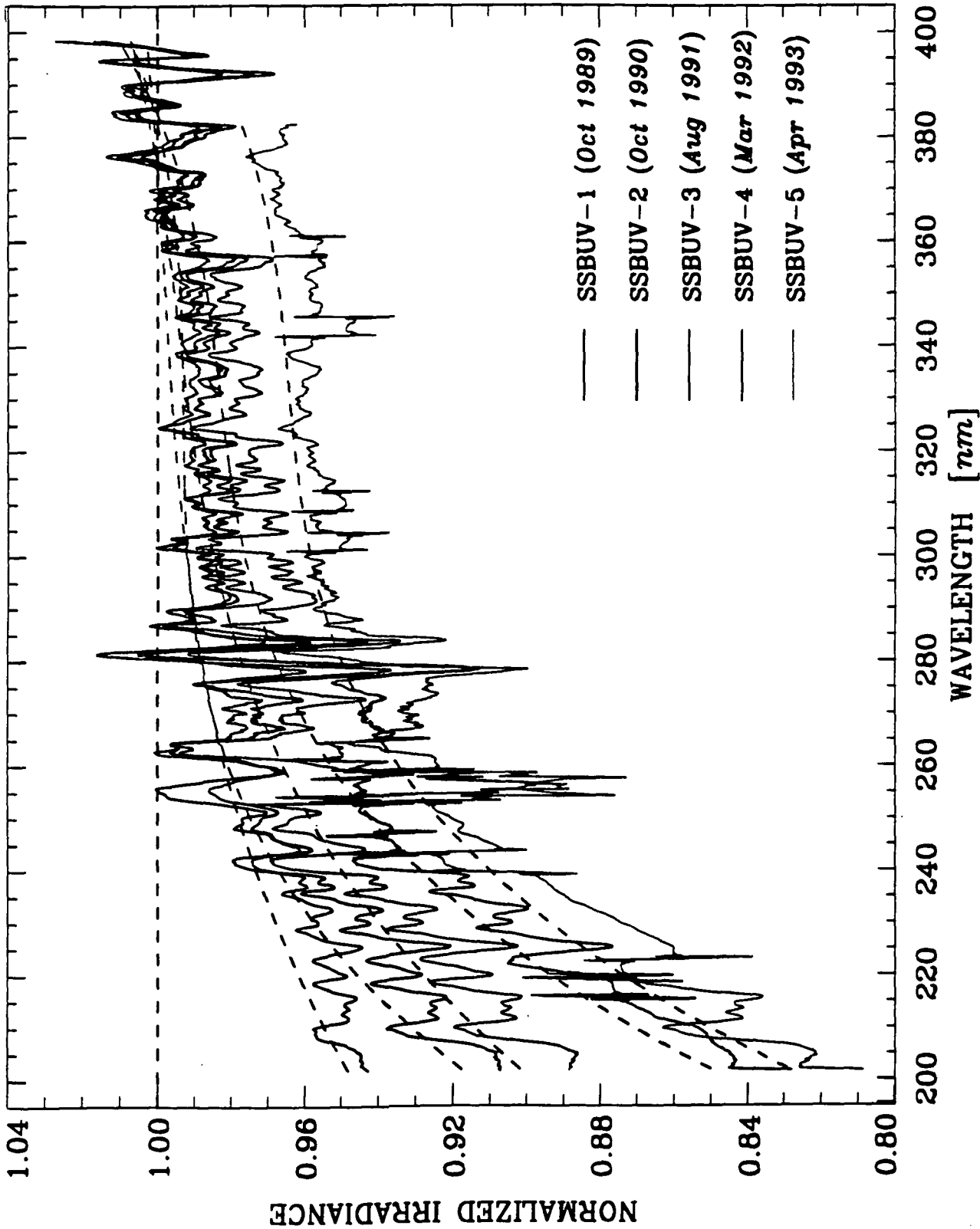
RED CURVE = 27-DAY SMOOTHED INDEX

NOAA-11, SSBUV SOLAR IRRADIANCE

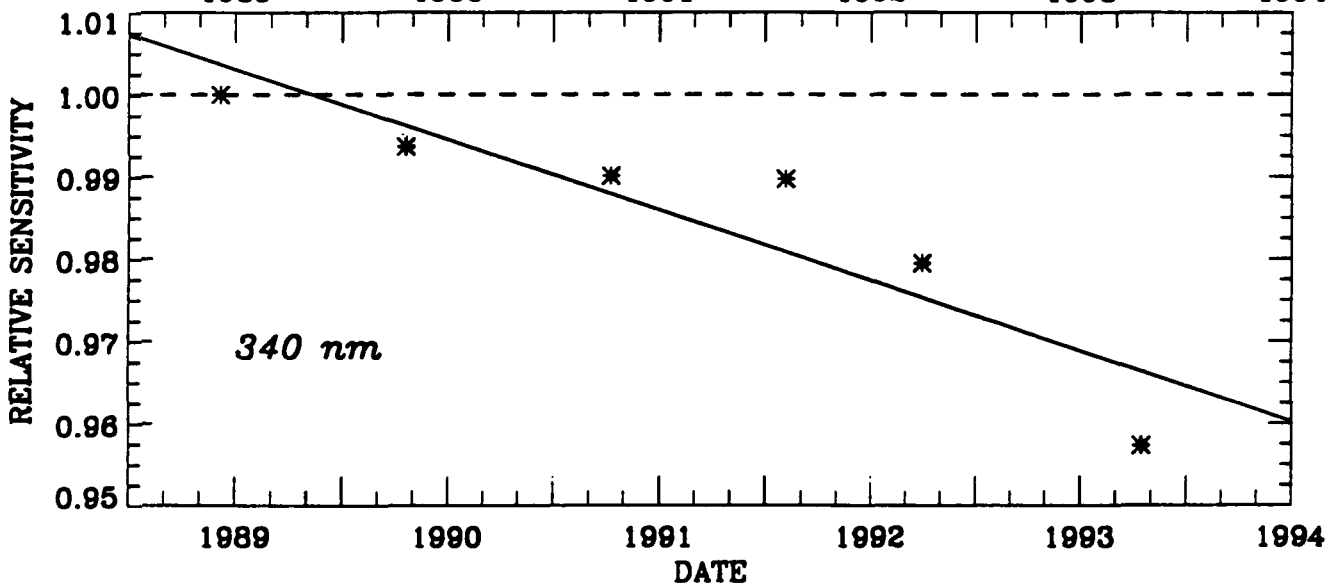
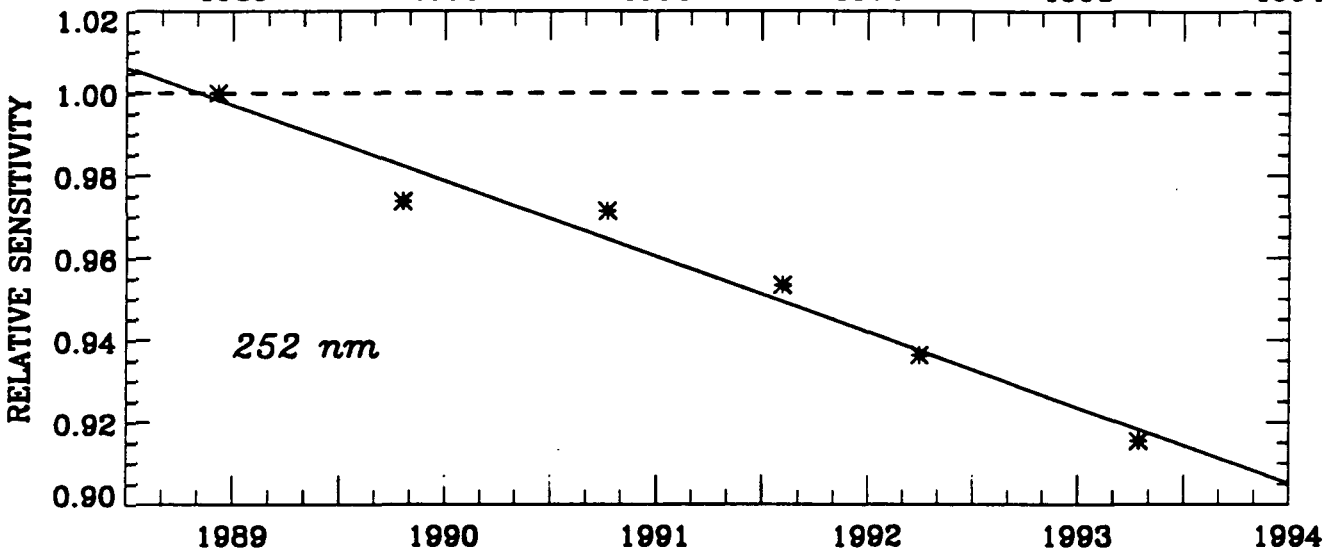
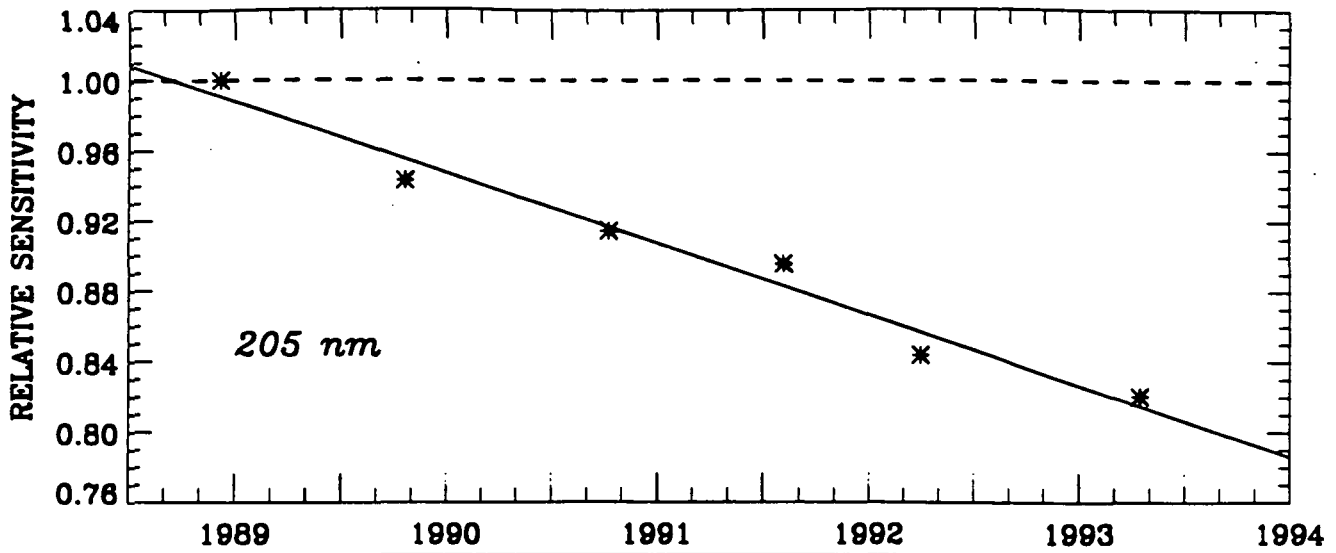
COMPARISON OF "DAY1" DATA



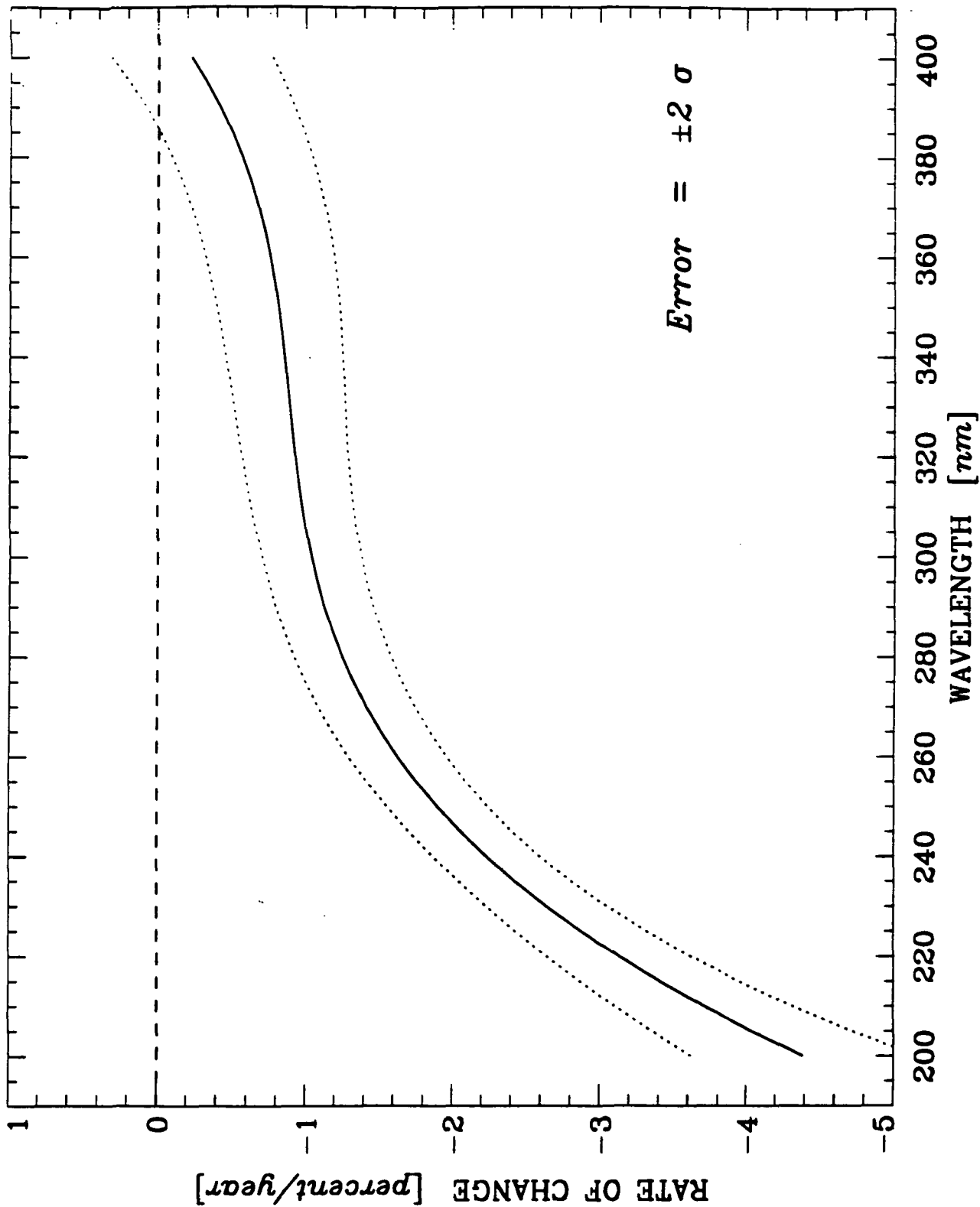
NOAA-11 OBSERVED SENSITIVITY CHANGE via SSBUV



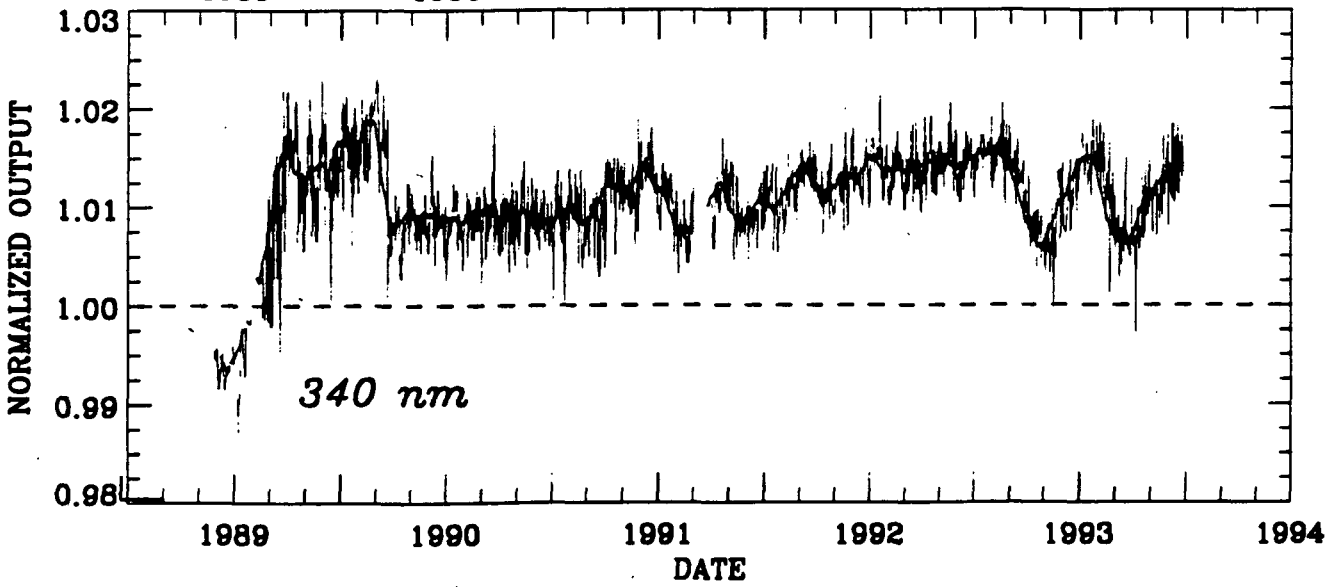
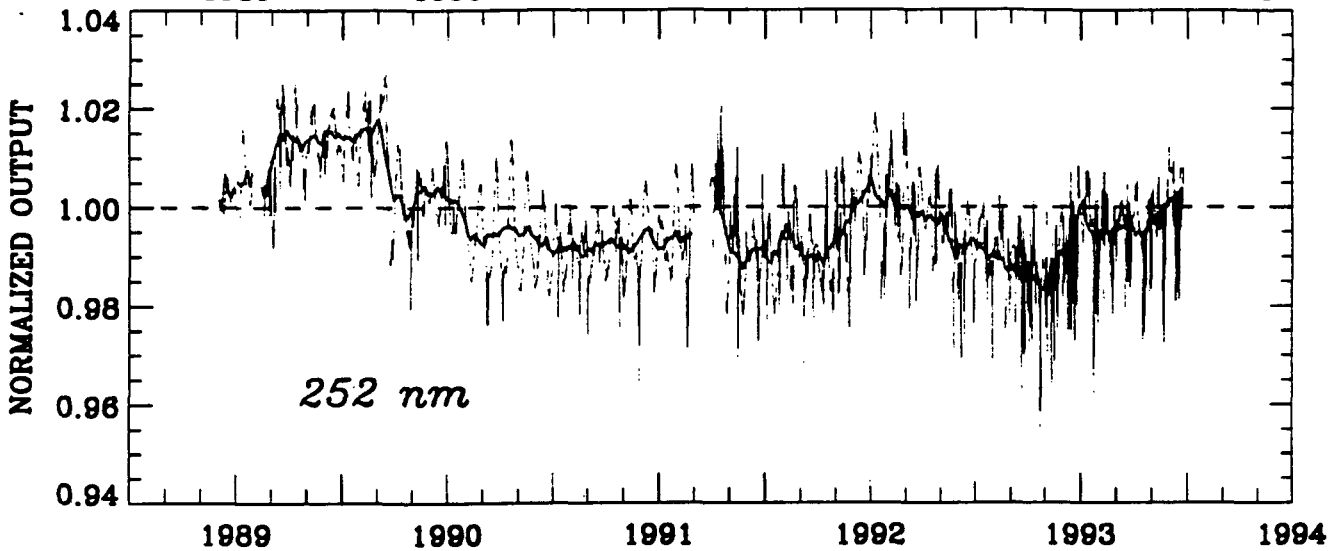
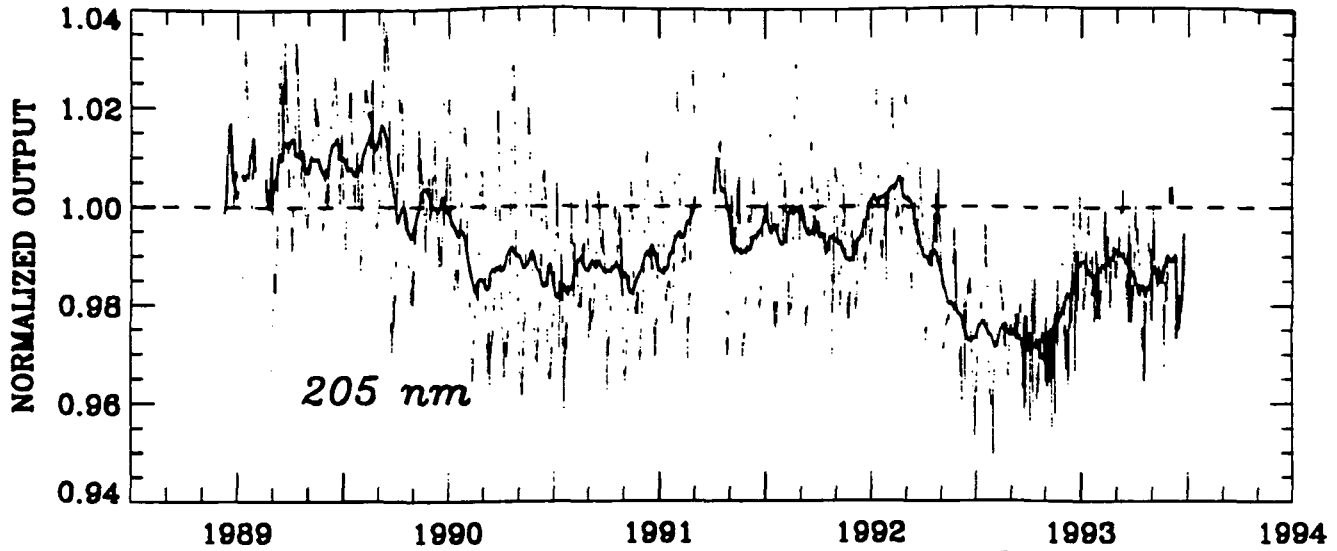
NOAA-11 CALCULATED SENSITIVITY CHANGE via SSBUV



NOAA-11 SPECTRAL SENSITIVITY CHANGE



NOAA-11 MEASURED SOLAR CHANGE



SUMMARY

NOAA-11 SBUV/2 SOLAR DATA: JANUARY 1989 TO OCTOBER 1994

**INSTRUMENT DRIFTS ~ 1-5%/YR - CANNOT USE UNCORRECTED DATA
TO DETERMINE SOLAR CHANGE**

**CORRECT DATA VIA COINCIDENT SSBUV OBSERVATIONS - WORK IN
PROGRESS**

CURRENT ACCURACY ESTIMATES:

**2-3% NEAR 200 NM
2% NEAR 250 NM
1% 300-400 NM**

SOLAR IRRADIANCE CHANGE 1989-1993:

**4% NEAR 200 NM
2% NEAR 250 NM
<1% 300-400 NM**