



## Summary of a Comparative Study on the Trends in Solar Spectral Irradiance in the Ultraviolet, Visible, and Infrared Regions

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Dating back to 1978, there is a long-term record of Solar Spectral Irradiance (SSI) predominantly in the FUV (110-180 nm) and the MUV (180-400 nm), and only since 2001 has there been an adequate record of measured changes in the visible and infrared spectral regions (400-2400 nm). The combined time series of these data sets indicate interesting and conflicting differences for SSI variations between the UARS era (Solar Cycle 22) and the SORCE era (Solar Cycle 23-24). Because of this, a workshop was convened at NIST to understand the origin of these discrepancies. Unlike the Total Solar Irradiance (TSI) or UARS-era SSI studies that concentrated on absolute scale offsets in irradiance, this workshop focused on issues primarily related to differences in understanding degradation trends that affect the measured solar cycle variations in irradiance. This first SSI workshop concentrated on 1) SSI instrument observations, capabilities, and estimated irradiance uncertainties; 2) each instrument team's methodology to analyze the spectral data to separate out instrument effects (e.g. degradation) from intrinsic solar variations; and 3) enhanced understanding of the SSI differences and refining the estimated uncertainties. This evaluation was done as an inter-instrument term-by-term comparison of the measurement equations associated with determining the degradation function. This approach was aided by additional discussion of laboratory and in-flight studies of the physical origin of degradation in space performed at NIST and NASA Goddard Space Flight Center. The workshop also laid the groundwork for a second workshop to determine the SSI requirements for Earth atmospheric and climate studies.