Trends in the Short-Term SSI variability over 100 Carrington Rotations from the UV through the Near IR

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The Spectral Irradiance Monitor (SIM) instrument onboard SOlar Radiation and Climate Experiment (SORCE) has been measuring the spectral irradiance (I, units=W m^{-2} nm^{-1}) from 200 to 2400 nm since mid 2003. In this project, we used these spectra to compute the fractional difference in irradiance ($\frac{I_{max} - I_{min}}{I_{min}}$) as a function of wavelength between 200 and 1630 nm for 109 Carrington Rotations from early 2004 through early 2012. The maximum and minimum spectra per Carrington Rotation were identified with a Magnesium II index (near λ 280 nm), which is a measure of chromospheric activity. We qualitatively correlated the fractional differences to the presence and location of sunspots and faculae based on synoptic maps of solar magnetic field from SOHO (Solar and Heliospheric Observatory), measurements of total solar irradiance (TSI, units = W m^{-2}) from TIM (Total Irradiance Monitor) onboard SORCE, irradiance measurements between 200 and 320 nm from SOLSTICE (SOlar STellar Irradiance Comparison Experiment), and a solar spectral irradiance prediction model. We focused on several case studies where there were changes in the hemisphere of dominant solar activity, indicated by variability in the periodicity of the MgII index. We found that the fractional differences in solar spectral irradiance between 250 and 400 nm is predominantly positive, indicating dominance by chromospheric plage brightening. In constrast, between 400 and 1600 nm the fractional differences ranged from negative to positive indicating a balance between chromospheric plage brightening and photospheric sunspot darkening.