



Solar Irradiance Variability: Comparisons of Observations over Solar Cycles 21-24

T. Woods

University of Colorado, LASP, Boulder, CO, United States (tom.woods@lasp.colorado.edu, 303-492-4224)

The Sun's radiation varies on all time scales: a few minutes in the case of solar flares, the 27-day solar rotation period, the 11-year solar activity (sunspot) cycle, and extended periods of centuries and longer. While much of the solar visible light varies by a small amount, about 0.1% over the 11-year solar cycle as does the total solar irradiance (TSI), the ultraviolet radiation varies much more, ranging from 10% for the Sun's chromosphere emissions in the middle and far ultraviolet to more than a factor of 10 for the hot coronal emissions in the extreme ultraviolet. While the solar visible light primarily deposits its energy at Earth on its surface or in the oceans, the ultraviolet radiation shorter than 300 nm is completely deposited into Earth's atmosphere. Recent solar ultraviolet observations from NASA's Solar Radiation and Climate Experiment (SORCE) and Solar Dynamics Observatory (SDO) satellites will be presented, highlighting the long cycle minimum in 2008-2009 and the rise of activity during the new solar cycle 24. These results are also compared to other satellite observations during the previous solar cycles 21-23, dating back to the early 1980s.