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Solar irradiance variability

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The variable radiative output from the Sun influences the Earth's atmosphere in a myriad ways. To judge exactly how large the influence is on different atmospheric layers, it is important to know not just the variation of the total solar irradiance (TSI), but also its spectral dependence, the spectral solar irradiance (SSI). Measurements of both quantities are now available for nearly 4 decades, although for SSI the coverage becomes increasingly patchy as one goes further back in time and even now the reliability of measurements longwards of 300 nm is contentious.
A number of models have been developed with various aims. One set of models aims to reproduce the data and to fill in the gaps in coverage. Other models aim mainly at reconstructing the irradiance at earlier times before measurements were available. In this talk a critical overview of the measurements and models of solar irradiance will be given.