

Towards the Next Generation of Solar Irradiance Reconstruction Models

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The first generation of models of solar irradiance were proxy-based, i.e. purely empirical. These were followed by models that combine spectra computed from semi-empirical model atmospheres, with a measure of solar activity variations. A successful example of this second generation of irradiance models is SATIRE (Spectral And Total Irradiance REconstruction). Thus the version of this model family valid for the satellite era, SATIRE-S, uses magnetograms and continuum images to determine the solar surface coverage by magnetic features and atmospheres computed by Unruh et al. (1999). The use of the semi-empirical models requires the introduction of a free parameter, which is one of the main shortcomings of this model. The next generation of irradiance reconstructions must go beyond this, using more realistic, purely theoretical model atmospheres obtained from 3D radiation MHD simulations. Here we briefly introduce the MHD simulations, the spectrum computations and the combination with magnetograms that is being implemented to get the next generation of SATIRE-S models.