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Reconstruction of the solar EUV irradiance from 1996 to 2012 based on SOHO/EIT images

Margit Haberreiter (1), Veronique Delouille (2), Benjamin Mampaey (2), Cis Verbeeck (2), and Seth Wieman (3)
(1) PMOD/WRC, Davos Dorf, Switzerland (margit.haberreiter@pmodwrc.ch), (2) Royal Observatory Belgium, Brussels, Belgium, (3) Space Science Institute, University of Southern California, Los Angeles, CA, USA

The solar EUV spectrum has important effects on the Earth's upper atmosphere. For a detailed investigation of these effects it is important to have a consistent data series of the EUV spectral irradiance available. We present a reconstruction of the solar EUV irradiance based on SOHO/EIT images, along with synthetic spectra calculated different coronal features representing the brightness variation of the solar atmosphere. The EIT images are segmented with the SPoCA2 tool which separates the features based on a fixed brightness classification scheme. With the SolMod code we then calculate intensity spectra for 10 to 100 nm for each of the coronal features. Weighting the intensity spectra with the area covered by each of the feature yields the temporal variation of the EUV spectrum. The reconstructed spectrum is then validated against the spectral irradiance as observed with SOHO/SEM. Our approach leads to a good agreement between the reconstruction and the observed spectrum. This study is an important step towards the understanding of the variations of the solar EUV spectrum and ultimately its effect on the Earth's upper atmosphere.