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Modeling the Variations of the Solar EUV Spectrum

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Solar spectral irradiance variations in the UV/EUV are important for the detailed modeling of the Earth's upper atmosphere. For the past decades very valuable data are available, however they lack a full temporal and spatial coverage, which is important for investigating and monitoring its effect on the Earth's atmosphere. Therefore, the need of robust and reliable models to reconstruct the irradiance for the full temporal and spectral range is very important. Here, we present the reconstruction of the EUV for specific time intervals for validation. These intervals will then be extended to the full Solar Cycle 23. First, we employ the decomposition of images taken with the Precision Solar Photometric Telescope (PSPT) and SOHO/EIT, deriving the area coverage of brightness features from the chromosphere to the corona. Second, synthetic spectra are calculated for each component for different positions on the solar disk and weighted by their area coverage. This leads to a time-dependent EUV spectrum which is compared with available observations.