

SPAM: Solar Spectrum Prediction for Applications and Modeling

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Introduction

Figures in this Supplementary file show the time series of solar irradiance for each spectral channel of the TIMED SEE instrument, covering the spectral interval from 0 to 190 nm with 1-nm resolution.

The panels on the left demonstrate the TIMED SEE measurements (red and green) for the entire period of spacecraft operation from 2002 to 2022 years. The vertical blue line denotes the date of the last calibration flight of a suborbital rocket on June 1, 2016. Half a year after the last calibration, artificial trends emerged in different spectral lines, which are easy to recognize by the sharp step-like change in the measured values (e.g. 43.5 nm,

46.5 nm, 55.5 nm and others). The data obtained before the sensor degradation is shown in red, and after – in green. The black curve denotes the Solar-SPAM model calculations based on the TIMED SEE Level 3 data shown in red and parameterized by daily F10.7 solar activity index.

The panels on the right show the scatterplots of the TIMED SEE solar irradiance versus the F10.7 solar activity index.

Figures capture. Left panels: time series of solar radiation obtained by the TIMED SEE instrument in each spectral channel from 0 to 190 nm with a resolution of 1 nm. The TIMED SEE measurements shown in red (before) and green (after sensor degradation); black curve is the Solar-SPAM model calculations. Blue vertical line denotes the date of the last absolute detector calibration on June 1, 2016. Right panels show the scatterplots of the radiation flux versus the F10.7 index and the quadratic interpolation line.











































































