

# **New Flare Model Using Recent Measurements of the Solar Ultraviolet Irradiance**

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The Flare Irradiance Spectral Model (FISM) is an empirical model of the solar irradiance spectrum from 0.1 to 193 nm at 1 nm resolution and on a 1-minute time cadence. The goal of FISM is to provide accurate solar spectral irradiances over almost the entire vacuum ultraviolet range (VUV: 0-200 nm) as input for ionospheric and thermospheric models used for space weather research and operations. The FISM is based on solar VUV irradiance measurements from the Solar EUV Experiment (SEE) aboard the Thermosphere, Ionosphere, Mesosphere, Dynamics, and Energetics (TIMED) satellite, the Solar Radiation and Climate Experiment (SORCE) satellite, and the Upper Atmosphere Research Satellite (UARS). The FISM accounts for the significant irradiance changes due to solar flares, which includes orders of magnitude increases in the X-rays to factors of two increases in the extreme ultraviolet wavelengths (EUV: 10-120 nm), as well as the solar cycle and solar rotational variations. The FISM is shown to model the solar cycle and solar rotational variations to within 7% in the VUV wavelengths as well as describe the changes in irradiance due to solar flares to within 15% at most VUV wavelengths. The FISM therefore provides the most accurately available values of the VUV irradiance at this high of temporal resolution from 1986 to the present.