

**Solar Flare Effects in the Thermosphere and the Ionosphere**

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Solar flares produce a large and rapid increases of solar irradiance in the X-ray and Extreme Ultra-Violet (EUV) ranges. This rapid increase of X-ray and EUV radiance instantly enhances ionization in the upper atmosphere and causes sudden ionospheric disturbances that affects radio communications and navigation systems. In the magnetic equator region, solar flares can cause prolonged F2-region disturbance and TEC enhancement. On the other hand, the enhanced ionization results in sudden heating that increases thermosphere neutral density. Through modeling and observational studies, we examine these solar flare effects and how flare characteristics influence these effects. In addition, we will present new results using SDO/EVE measurements.