

GNSS AND RISING ACTIVITY IN SOLAR CYCLE #25

February 2023 solar storms

Heightened solar flaring activity produced a pair of solar storms which began impacting Earth on February 26, 2023 (UTC). Radiation from solar storms follows the Earth's magnetosphere which directs the energy toward each

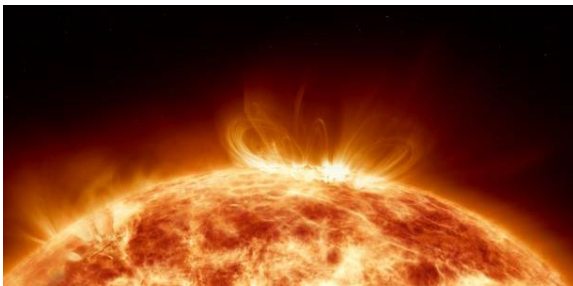


Figure 1: Solar filaments are arcs of hot plasma extending up into the sun's corona along complex magnetic field lines and can cause solar flares when they erupt suddenly.

pole. The radiation also excites the ionosphere, resulting in two interesting byproducts. One is the aurora, also known as the Northern Lights. The other is the disturbed signal paths for GNSS signals.



Figure 2: The Northern Lights over Calgary, Canada, on the night of February 26, 2023.



Figure 3: A measure of estimated ionospheric activity (bottom) compared to latitude, longitude, and height variations experienced at two high-latitude GNSS base station sites for the same timespan (middle and top).
 Estimated planetary K Index source: Space Weather Prediction Center, NOAA. <https://www.swpc.noaa.gov/products/planetary-k-index>
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