

Observations and simulation of the ionospheric response to X-class solar flares

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Solar flares are known to be bright and short-lived (a few tens of minutes typically) flashes of XUV radiations emitted from active chromospheric regions of the Sun. They may contribute to the ionisation of the upper part of Earth's atmosphere. Although their effects decrease rapidly with solar zenith angle, and thus with latitude, we have identified cases of powerful X-class flares for which EISCAT radars monitor the subsequent ionisation. In EISCAT data, solar flares are seen to increase the electron density in the E- and F1-regions, by a factor up to 2.5 around 120 km altitude where the effect seems to be the greatest. From the ionospheric modelling point of view, taking solar flares' emission into account is challenging since most of the solar insolation models are daily averaged. Still, we shall present a first attempt to model the ionospheric effects of an X-class flare on the polar dayside ionosphere.