Geophysical Research Abstracts
Vol. 21, EGU2019-82, 2019
EGU General Assembly 2019

Equatorial ionospheric electrodynamics during solar flares

Ruilong Zhang and Libo Liu
Institute of Geology and Geophysics, Chinese Academy of Sciences, China (zhangruilong@mail.iggcas.ac.cn)

Solar flare is an extreme space weather event that induces sudden increase in solar X-ray and extreme ultraviolet irradiance. The increased irradiance produces the extra ionization at Earth's ionospheric heights and results in various disturbances, disrupting navigation and communication systems.
Previous investigations on ionospheric responses to solar flares focused mainly on the photoionization caused by the increased X-rays and extreme ultra-violet irradiance. However, little attention was paid to the related electrodynamics. In this report, we explored the equatorial electric field and electrojet in the ionosphere at Jicamarca during the flares from 1998 to 2008. The most important finding is to verify that solar flares increase dayside eastward equatorial electrojet but decrease dayside eastward electric field. During flares, the enhancement in the Cowling conductivity may modulate ionospheric dynamo and decrease the ionospheric electric field.