

Disturbances of the electron density and temperature in the low- and mid-latitude topside ionosphere during magnetic storms

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The electron density and temperature had been measured by the Ionospheric Measurement Sensor (IMS) onboard the KOMPSAT-1, which has a sun-synchronous orbit with descending node at 22:50LT and the altitude of 685 km. The data observed during several magnetic storms were analyzed to determine the effects of magnetic storms on the topside ionosphere. The electron density and temperature were disturbed during magnetic storms depending on the phase of storms and the magnitude of the Dst index. During the main phase the electron density increased over the mid-latitude region around 30oML. In contrast, the electron temperature increased near the magnetic equator and high-latitude region, but decreased over the mid-latitude region where the electron density increased. During the recovery phase the electron density also increased near the magnetic equator. The density enhancement near the magnetic equator lasted to the late recovery phase, but the mid-latitude enhancement was soon restored to the quiet time level. These changes can be explained by the disturbance of the electric field and the resulting changes of the vertical drifts.