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# Development of DP2 Currents and Ionospheric Response at Mid- and Low-Latitudes During Geomagnetic Storms

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Using data of the global magnetometer networks (INTERMAGNET, NICTnet) from the polar cap to the dip-equator, DP2 ionospheric currents are examined for geomagnetic storms to estimate quantitatively the convection electric field at the mid- and low-latitudes. We found that the D-component of the magnetic field at mid-latitudes increased in the morning sector of 06-09 MLT and decreased in the afternoon sector of 14-18 MLT. The magnetic disturbances are closely correlated with the DP2 magnetic disturbances in the H-component in the polar cap and at the dip-equator. The local time and latitudinal dependence of the magnetic disturbance indicates that the DP2 currents cause the disturbances in D-component at mid-latitudes. Observations of Ionosondes at low-latitudes and the dip-equator (Chiang Mai, Kototabang, Chumphon) showed that the moment the main phase of the storm on May 15, 2005 started, the ionosphere started to move upward on the dayside. The virtual height at Chiang Mai increased by 90 km at 8 MHz in 30 minutes. Furthermore, TEC increased at mid- and low-latitudes (26-45 degrees magnetic latitudes) by 10-15 TEC units from a quiet time level. These observational results strongly suggest that the convection electric field penetrates from the polar cap to mid- and low- latitudes during the main phase of the geomagnetic storm. We quantitatively estimate the convection electric field based on the ionosonde and the magnetometer networks.