

Day-to-day Variation of Equatorial Electrojet Controlled by Mid-latitude Sq Current System

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A dense network of geomagnetic field observations along the 210-degree magnetic meridian 2000-2002 enabled us to determine daily values of (1) the total current intensity of the equivalent Sq current system J_{total} in kilo-amperes and (2) the distance between the northern and southern foci of the equivalent Sq current system d_{NS} in degrees. It is found that the daily range of the north-south component of the geomagnetic field at Davao (a dip-equatorial station in Philippines) can be well described in the simple form: $(J_{total}+76.379)(-0.007d_{NS}+0.8217)$. The results suggest that the day-to-day variation of equatorial electrojet is largely controlled by the intensity and shape of the mid-latitude Sq current system and local effects are of secondary importance (about 10%).