

Another approach to consistency between field-aligned current distribution and geomagnetic disturbances

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East-west geomagnetic disturbances at mid latitudes are mainly attributed to field-aligned currents. In the dark region of the polar cap where ionospheric conductivity is small, geomagnetic disturbances are mainly attributed to field-aligned currents as well, because the effects of ionospheric currents are negligible. We estimated global field-aligned current distribution from a combination of mid-latitude and polar-cap geomagnetic data with a simple inversion method. The results are consistent with the general pattern of field-aligned currents obtained by the past studies consisting of the Region-1 and Region-2 currents. This suggests that the combination of the Region-1 and Region-2 currents well explain the geomagnetic disturbances at mid latitudes and the polar cap.