

Statistical analysis of the phase difference between the sfe and Sq vectors

Tomomi Tanaka[1], Yuji Yamada[2]

[1] Magnetic Observatory,JMA, [2] Kakioka Magnetic Observatory

On quiet (no substorm) days, the geomagnetic field on the ground is dominated by a daily variation (Sq). This variation has been considered to originate from the (Sq) current of the ionosphere. When the solar flare occurs, the magnitude of the Sq current is increased temporarily due to the enhancement in the ionospheric conductivity produced by the X(EUV,UV) radiation emitted from the solar flare. And so, the geomagnetic field on the ground is perturbed. This phenomenon is called solar flare effect (sfe). Viewed in this way, it seems to be quite all right to think that the sfe current system and the Sq current system in the ionosphere are the same. However, there are few reports about the sfe and Sq current, which has been reported that the focus of the sfe system is about 1 hour(L.T.) east of the Sq system in some sfe events. On the other hand, there are very few reports about statistical analysis of the phase difference between the sfe and Sq vectors, and which seems to be a worthwhile subject to investigate.

This reports presents the result of the statistical analysis of the phase difference between the sfe and Sq vectors at Kakioka, Memambetsu and Kanoya observatory during 44 years (1957-2000). We found a local time and a season dependence of the phase differences between the sfe and Sq vector, and the sfe current system is not simple increase of the Sq current system.