

Relationship between the solar activity and the ionospheric conductivity and geomagnetic Sq amplitude

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Control of the solar activity (SSN) and ionospheric conductivity on the geomagnetic Sq (Y) field were examined for each month of a year. Sq(Y) normalized by SSN or conductivity is clearly smaller in local winter, which can be explained that Sq(Y) amplitude is controlled by the conductivity at higher latitudes through the field-aligned current driven by the asymmetry of ionospheric dynamo action. Analysis of Sq(Y) amplitude in a long period shows that weakening of the geomagnetic main field strength diminishes the amplitude for the same value of the conductivity through the reduction of the dynamo electric field, but enhances for the same value of SSN.