

## Long term variation of geomagnetic Sq field over 100 years

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The long-term variation of the geomagnetic Sq field over 100 years at several observatories was studied in the Y-component as well as the ionospheric conductivity estimated by the IRI model. The amplitude of the geomagnetic Y-component (Sq(Y)) depended strongly on solar activity, and showed features similar to those in the solar activity even when 11-years running averages were employed. The solar activity dependence of Sq(Y) can be fully explained by that of the ionospheric electrical conductivity, and wind velocity tends to be large for low solar activity; and slower in the middle of the 1900s in response to higher long-term solar activity. On the other hand, other long-term variations were not clear in the wind velocity. Although the dynamo theory predicts that the Sq current is enhanced when geomagnetic main field intensity decreases, the result of the present analysis does not necessarily support this prediction.

Keywords: geomagnetic daily variation, long-term variation, solar activity, main field strength, electric conductivity, wind velocity