



Statistical characteristics of the day-to-day variability in the geomagnetic Sq field

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Day-to-day variability of the geomagnetic Sq field is studied by using the magnetic data from a meridian chain of magnetometers along 120⁰ E longitude. The method of Natural Orthogonal Components (NOC or eigenmode analysis) is applied to separate the Sq variation from complicated disturbances. The first eigenmode with the largest eigenvalue represents fairly well the Sq variation with a conspicuous day-to-day variability in the daily range. For the stations on the same north- or south-side of the Sq current system focus, the day-to-day variations show a positive correlation. In contrast, for the stations on the different sides of the Sq focus, they show a negative correlation, suggesting an important role of latitudinal shift of the Sq current system focus to the day-to-day variability of the Sq daily range. The Sq daily range is correlated with the magnetic indices Ap and Dst in a peculiar way: on some severe disturbed days, noticeably enhancements of the Sq are observed, implying increases of the ionospheric conductivities and/or tidal wind velocities; on other severe disturbed days, however, dramatically reduced Sq variations occur, suggesting dominant effects of the 'disturbance dynamo' process.