



Studies on the Geomagnetic Induction Vectors of China

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In this study, the geomagnetic data of 16 stations, near 6 years for most, provided by the National Geomagnetic Center of China, were used to study on the geomagnetic induction vectors. The stations cover the whole North China and part of southwestern China, both of which has a complicate geological and tectonic background. This study will not only advance the understanding of regional tectonic variations, but also provide some suggestions on the construction for geomagnetic observation network of earthquake monitoring.

The time series of geomagnetic induction vectors were obtained by the robust estimation method, which has been verified and compared with the ordinary least square and the weighted square method. A principle of selecting a specified period's results from the robust estimation method was defined. Then, the results with the period of 640s for all stations were selected by this principle.

The long-term trends (more than six months at least) within the time series were extracted by the Fourier harmonic analysis. Consistent phase variations exist for most stations within a similar tectonic background. About one-month period variations in the most stations' results after removing the long-term trends were found. Spectrum analysis for the results and geomagnetic activity index showed that those phenomena may relate to the period of the global geomagnetic activity.

A preference azimuth of the geomagnetic induction vectors was found in each station by statistical analysis on the time series. It pointed out the possible relatively high conductivity structures. Exactly, geomagnetic vectors of BJI, JIH, LYH and TAY station, which surround the basin of North China, suggested a relatively higher conductivity layer; that of stations around the Erdos block suggested a complicated structure. Three-dimension inversion by ModEM verifies our results.