

APPLICATION OF GEOMAGNETIC VARIATIONS DATA TO STUDY ELECTRIC CONDUCTIVITY OF THE EARTH'S CRUST AND MANTLE

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Geomagnetic variations, observed on the Earth's surface, depend, in particular, on "telluric" currents, induced in the Earth's deep layers. This current system is connected with electric conductivity distribution in the interiors. The lower is the frequency of variations, the larger is the depth of telluric currents penetration. This principle is used in deep electromagnetic sounding methods: magnetotelluric and magnetovariational. In global scale, INTERMAGNET data is mainly used to image major conductivity anomalies in the Earth's mantle. In more detailed regional studies of the Earth's crust and upper mantle most of the data is obtained in temporary observation sites. Deep conductivity anomalies were revealed all over the globe, although their nature is still not very well understood. Strong conductive anomalies in the upper mantle, generally at 70-250 km depth, are probably connected with partial melting in ductile asthenosphere, covered by brittle lithosphere. Many of the crustal anomalies, mainly occurring at 10-30 km depth, are considered to be graphitized and/or fluid saturated permeable fault zones.