ON THE DETERMINATION OF THE ELECTRIC CONDUCTIVITY OF THE EARTH'S INTERIOR FROM GEOMAGNETIC DATA

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1. BACKGROUND

In the study of electrical conductivity as a function of depth within the Earth, the structure of the external and internal components of the Earth's transient magnetic field plays a crucial role for two reasons. On the one hand, the relationship between the external and internal components is determined solely by the electrical conductivity, and, on the other, estimates of the relationship can be determined from observational data. The form of the estimates of the external and internal components derived from observational data depends heavily on the subsequent use to be made of them. In fact, when information is required about the average spherically symmetric structure of the Earth's electrical conductivity, it is necessary to use global features of the Earth's transient magnetic field. In this paper, we discuss how to reconstruct the external and internal components of the P_1° - field for the period 1964-1965. Because missing data techniques have been applied so that observatories, which had less than 1% of their hourly values missing for the period 1964-65, could be included in the analysis and because more than the normal number of observatories were operational in the International Geophysical Year period 1964-65, the estimates for the P_1° - field will be based on the most comprehensive data-base so far acquired. We will present some preliminary results on the distribution of the electric conductivity in the interior of a spherical model Earth.