LARGE-SCALE EUROPEAN MANTLE ELECTRIC STRUCTURE AS DERIVED FROM RING CURRENT AND GEOMAGNETIC OBSERVATORY DATA

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The variable external geomagnetic field induces a response of the Earth's interior both by magnetic induction in the magnetic rocks above the Curie temperature and by electromagnetic induction in the conductive crustal and mantle structures. These two components of the internal response are evidenced in case of the solar-cycle-related variation extracted from the annual means time series of European geomagnetic observatories, by means of a magnetic induction model applied to the mentioned variation.
While the calculated values of the model are related to the magnetic properties of crustal rocks, the residuals contain information on the electric properties of the underground. The external source in this case is the ring current variations, as represented by the external component of the Dst geomagnetic index (Est geomagnetic index). In terms of current loops surrounding the observation point, the resistance and the inductance of conductive crustal and mantle structures derived and their lateral variation in the study area is discussed.

mantle electric structure, geomagnetic data, ring current

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