Geophysical Research Abstracts,
Vol. 11, EGU2009-7375-1, 2009
EGU General Assembly 2009

Inferred lateral variation of magnetic and electric properties of the European crust and mantle from diurnal variation 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 diurnal variation recorded at European geomagnetic observatories, by means of a magnetic induction model applied to one-minute averages of geomagnetic elements. The calculated part of the model is related to the magnetic properties, while the model residuals contain information on the electric properties of the underground. Several 7-days time intervals were analysed. Based on the two components of the internal response, information on the lateral variation of the magnetic and electric properties of the underground was inferred. A comparison with previous information based on the 11-year solar cycle-related variable external field is discussed as well.