

# **AN INDUCTION – BASED MAGNETIC MODEL OF THE EUROPEAN LITOSPHERE**

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In this paper we exploit the fact that variable external sources induce a variable response of the Earth's interior by both magnetic and electromagnetic induction. A magnetic induction model, in which the induced field is a linear combination of the components of the inducing field, is applied to the time series of the solar-cycle-related variation, present in the annual time series from the European geomagnetic observatories. The coefficients of the linear relationship, which depend on the magnetic permeability of the rocks beneath the observatory, are calculated by a least squares procedure. As an external source, the ring current is considered, represented by the external component of the Dst geomagnetic index (Est). The inducing X, Y and Z components are derived for each observatory location and the model is compared to the extracted solar-cycle-related variation. The lateral variation of the calculated coefficients reveals the large-scale distribution of the bulk magnetic properties of the crust down to the Curie temperature in the study area. A comparison with satellite-based models of the observatory bias is presented as well.

Annual geomagnetic data, Est geomagnetic index, induction model

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