Geophysical Research Abstracts, Vol. 7, 03334, 2005
SRef-ID: 1607-7962/gra/EGU05-A-03334

New approach in modelling the global crustal magnetic anomalies: role of Curie-isotherm

K. Hemant(1), F. Schilling(1) and S. Maus(2,3)

(1) GeoForschungsZentrum, Potsdam, Germany (hemant@gfz-potsdam.de / Fax: 0049-331-2881235 / Phone: 0049-331-2881271), (2) CIRES, University of Colorado, Colorado, USA, (3) Also at National Geophysical Data Center, National Oceanographic and Atmospheric Administration, Colorado, USA

The new crustal magnetic anomaly maps produced from the CHAMP satellite data are now widely used to infer the geological structure of the Earth's crust. The sources to these anomalies are mostly due to the induced and remanent magnetisation of the crust lying above seismic Moho. However, the thickness of this magnetised crust is largely influenced by the Curie-isotherm variations within the crust. Using a Geological Information System (GIS) based modelling technique, the thermal conductivity and the specific heat of the exposed rock types are combined following the surface heat flow equation and Curie-isotherm depth is defined in the continental regions of the Earth's crust. Curie-isotherm depth curve defines the lower limit of the magnetised crust below which it is assumed that the crust is non-magnetic and does not contribute to the observed magnetic anomaly. The improved vertically integrated susceptibility (VIS) map of the continental crust is then used to predict the vertical field anomaly map at satellite altitude and compared with the corresponding observed anomaly map. The results of preliminary investigation over the Precambrian crust show a marginal to significant improvement in the predicted anomaly values in comparison with the observations. It is expected that addition of heat flow information to the existing crustal magnetisation model should help to infer the geological information in the less explored regions of continents.