Geophysical Research Abstracts
Vol. 15, EGU2013-7313, 2013
EGU General Assembly 2013

Statistical analysis of the lithospheric magnetic anomaly data

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Different analyses carried out on the lithospheric magnetic anomaly data from GEODAS DVD v5.0.10 database (World Digital Magnetic Anomaly Map, WDMAM) show that the data distribution is not Gaussian, but Laplacian. Although this behaviour has been formerly pointed out in other works (e.g., Walker and Jackson, Geophys. J. Int, 143, 799-808, 2000), they have not given any explanation about this statistical property of the magnetic anomalies. In this work, we perform different statistical tests to confirm that the lithospheric magnetic anomaly data follow indeed a Laplacian distribution and we also give a possible interpretation of this behavior providing a model of magnetization which depends on the variation of the geomagnetic field and both induced and remanent magnetizations in the terrestrial lithosphere.