



Multiscale analysis of magnetometric data in Europe

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Various approaches exist to estimate the sources depths and parameters from potential fields measurements. Some of these methods use a "multiscale approach" based on data measured or calculated at different altitudes (scales), combined with differential operators. The aim of this work is to apply, for the first time, multiscale methods to magnetic fields related to the deep Earth's crust, using either aeromagnetic or satellite data. For this analysis we choose the Central European area, where the main geological structure is represented by the Trans European Suture Zone (TESZ); an extended and complex fault district that divides Europe in two large platforms: the Paleozoic Central Platform and the Precambrian East European Platform. The first step is the evaluation of the magnetic field inclination and its variation in our large area of interest, taking into consideration the extent of the upward continuation operator at different altitudes. We found that at a 200 km altitude, this variation causes only small errors. The aeromagnetic data were upward continued up to 450 km of altitude and compared with the geomagnetic satellite model data (CM4) at the same scales. These results show small and high-frequency anomalies at low altitude (0-50 km) while, from 50 to 450 km, a long wavelength anomaly takes place in Central Europe, defined mainly by a large magnetic low. The results obtained on the basis of the field and of the analytical signal and field modula allowed considering the magnetic low as the union of the TESZ effect with the probable presence of reversely magnetized bodies within the Paleozoic platform. The multiridge method depends only on the positions of the field extreme points and allowed interesting results along three different profiles through the Central European area and the TESZ allowing the reconstruction of the main structures and of the Moho.