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# CMB models based on gravity and magnetic data inversion and core material flow

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On the basis of a technique for 3D potential field data inversion worked out by the author earlier, gravitational and magnetic models of the core-mantle boundary (CMB) have been developed. The gravitational model agrees quite well with seismological data. The magnetic model represents a homogeneously magnetized body with the same external magnetic field as the Earth's core, the uplifts of its surface are related to the regions with increased values of magnetic field. The shape of such a model represents a quite vivid illustration of the internal magnetic field in the core, besides, while constructing a homogeneous magnetic equivalent, we find ourselves in the class of uniqueness.

The comparison of the models has revealed their correlation: regions exhibiting high values of the magnetic field in the Earth's core correspond to depressions in the core-mantle boundary reconstructed from gravity data. This correlation has led us to a hypothesis that core material flow is downwelling under depressions of CMB and these downwellings act to concentrate magnetic flux. To examine the hypothesis in indirect way, geometry of homogeneous magnetic equivalents, corresponding to different geomagnetic epoches, has been studied. The study of the behaviour of homogeneous magnetic equivalent relief isolines in time could be regarded as an independent approach to investigate the core material flow. If the hypothesis is valid and the flow still takes place, then the internal magnetic field in the regions of its increased values must grow further. As a result, the isolines of homogeneous magnetic equivalent relief should expand. The expansion of the isolines for the solutions, corresponding to epoches 1960, 1980 and 2000, apt to confirm our hypothesis about core material flow.