

On the some magnetic properties of the Earth's solid core

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Abstract

The role of the solid part of Earth's core in the generation, stabilization and maintenance of the Earth's magnetic field and influence of this field on the properties of the solid core have not been sufficiently studied until now.

It is well known that the core consists essentially of iron. In the last 10-15 years new methods were developed for the study of its properties at high pressure and temperature. As was shown in different experiments, the crystal structure of the iron is returned to the bcc state in the Earth's solid core. In this report we will discuss the possibility that the core can be in the vicinity of the Curie point. At the same time, it is shown that if the solid core temperature is somewhat higher than the Curie temperature, then the effective magnetic field generation connected with magnetic moment fluctuations near the transition point is possible. The estimate of the effective magnetic field is obtained in our work.

Simultaneously, we have estimated the interaction of the solid part of the core with magnetic field generated in its fluid part.