

Modelling of Earth's Magnetic Field Reversals in Modified Electromechanical Models

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Abstract

Earth's magnetic field protects our planet from charged particles coming from the sun (solar wind). Because of its importance, physicists have been researching the origins of the Earth's magnetic field and its characteristics. Dynamo Theory provides magnetohydrodynamic equations which are hard to solve and analyze due to core's extreme parameters. On the other hand, there exists different approach to the problem. Some try to make electromechanical analogues of Earth's magnetic field to study various physical properties. We discuss Bullard's one disk and Rikitake's two disk dynamos with some modification. In both models we've managed to control reversals using additional external current. Moreover, in Bullard's dynamo we've managed to induce reversals by introducing time delay in the system while Bullard's classical dynamo doesn't exhibit field reversals.

Keywords: Earth's Magnetic Field, Geodynamo, Geomagnetic Reversals, Disk-Dynamo Models, Reversals, Rikitake's Model, Bullard's Model

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