

Control of Reversals in Rikitake's Model

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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. On the other hand, there exists different approach to the problem. Some try to make electric circuit analogues as a 'toy models' of Earth's magnetic field. Unlike Bullard's one disk dynamo, in Rikitake's two disk dynamo reversals of the magnetic field polarity can be observed which, in fact, is seen in paleomagnetic researches. Rikitake's system exhibits chaotic behaviour for some parameters. Our goal is to study Rikitake's system and try to control reversals using some outer factor and a new parameter.

Keywords: Geodynamo, Earth's Magnetic Field, Rikitake's Model, Chaos, Reversals, Chaos Control

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