

Abstract Submitted
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Effect of parameter modulation on the dynamo effect in a rapidly rotating spherical shell VINCENT MORIN, ENS-Lyon — The dynamo effect is the process by which the magnetic field of the Earth is generated. In the presence of a small initial magnetic field, convective motions in the fluid outer core produce currents and thus a magnetic field which can reinforce the initial field and sustain it against ohmic diffusion. There is also a feedback of the magnetic field on the flow which limits its growth. Our direct numerical approach consists in solving the equations for the velocity field, the magnetic field and the temperature in a rapidly rotating spherical shell. Convective motions in our system originate from a thermal forcing. The effect on the flow of this forcing can be modulated in time through a modulation of the control parameter. We first focus our study on the impact of this modulation on convection without magnetic field. Depending on parameters and characteristics of the modulation, many interesting features such as shifts of the convective threshold and resonances are found. The magnetohydrodynamic case is then considered. The impact of the parameter modulation on the dynamic of the magnetic field and on the dynamic of reversals of its polarity is studied.

Mickael Bourgoin
CNRS

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