

Abstract Submitted  
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**Numerical simulation of the induced magnetic field within a rotating concentric annulus with self gravity**<sup>1</sup> ARES CABELLO, RUBEN AVILA, UNAM — In order to study the GEODYNAMO is necessary to know the behavior of the natural convection of the electrical conducting fluid confined in a rotating spherical shell. In this work, the convective patterns within this geometry are presented. Natural convection is induced by a temperature difference between the inner sphere and outer sphere and a gravitational field which varies like  $1/r^3$ . The patterns presented are known as Busse cells and are moving around the rotational axis. The magnetic fields induced by previously mentioned convective patterns are presented. These magnetic fields are obtained by solving the equations of MHD. The free-divergence magnetic field is obtained by using a Lagrange multiplier scheme. All the equations are solved based on a spectral element method (SEM). To avoid the singularity at the poles, the cubed-sphere algorithm is used to generate the mesh. The obtained magnetic fields are similar to the results reported by other research groups.

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