Thermally Driven MHD Dynamo
in a Rotating Spherical Shell

by

Hideaki Kitauchi

International Arctic Research Center

ABSTRACT

In order to find a possible mechanism of the geodynamo the motion of an electrically conducting Boussinesq fluid which is driven by the thermal convection in a rotating spherical shell is investigated numerically. It is observed that the dynamo action can be effective when the Roberts number is below a critical value and that the polarity of the magnetic dipole moment changes chaotically in time. The intensification mechanism of the magnetic field --- the concentrate-and-stretch of the magnetic lines --- is clarified at the first time by a detailed comparison of the spatial structures of the velocity and the magnetic fields.