

Numerical Study on MHD Dynamos with Special Reference to the Dynamo Benchmark

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A number of numerical computations of MHD dynamos have been performed for the dynamo benchmark. Three comparatively simple cases have been studied; non-magnetic convection, MHD dynamo with an electrically insulating inner core and another dynamo with an electrically conducting inner core. Present results show a good agreement with those reported by other groups, and hence it is concluded that our numerical code is justified.

The most fundamental difference between the non-magnetic convection and the MHD dynamo is the disparity of two kinds of convective rolls (i.e. cyclone and anti-cyclone). In the cases of the MHD dynamo, anti-cyclones are dominant, whereas in the non-magnetic convection, both the types of convective rolls have similar magnitudes.