

# Large-scale dynamo mechanism in nonhelical MHD: Energy transfers vs. alpha dynamo

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The growth of the large-scale magnetic field is an important problem in dynamo research. It is typically assumed that the kinetic and magnetic helicities play an important role in this process. In this presentation we show that the large-scale magnetic energy can grow in nonhelical magnetohydrodynamics when random non-helical forcing is employed at length  $1/10$  the box size. We performed a spectral simulation on  $512^3$  grid at Prandtl number of unity; the steady-state Reynolds number is 93.

We performed detailed energy transfer studies at different scales, and show that the growth of the magnetic energy at large-scale occurs due to energy transfers to the magnetic field from the large-scale velocity field, and from the small-scale magnetic field (inverse cascade). Our study is important for the large-scale dynamo mechanism. We will also present a preliminary report on symmetries of dynamo reversals.

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