Mathematics > Numerical Analysis

Nonlinear dynamo in a short Taylor-Couette setup

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It is numerically demonstrated by means of a magnetohydrodynamics code that a short Taylor-Couette setup with a body force can sustain dynamo action. The magnetic threshold is comparable to what is usually obtained in spherical geometries. The linear dynamo is characterized by a rotating equatorial dipole. The nonlinear regime is characterized by fluctuating kinetic and magnetic energies and a tilted dipole whose axial component exhibits aperiodic reversals during the time evolution. These numerical evidences of dynamo action in a short Taylor-Couette setup may be useful for developing an experimental device.

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