

Three-dimensional self-consistent dynamo simulation: Similarities and differences among the models

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Since 1995, quite a few papers have reported the three-dimensional, fully nonlinear self-consistent dynamo simulationss which were constructed to study the origin of the Earth-like magnetic fields. Because of the large varieties in the simulation, however, a direct comparison between different simulation results is quite difficult. The difficulty is caused by the differences in the normalization of equations, the boundary conditions, the nondimensional parameters involved, or even the governing equations themselves. In this paper, I try to review these differences, to point out the features which are common to many simulation results, and to consider inferences to the geomagnetic field.