

Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Efficiency of magnetic dynamo action at low magnetic Prandtl numbers STANISLAV BOLDYREV, University of Wisconsin-Madison, LEONID MALYSHKIN, University of Chicago — Amplification of magnetic field due to kinematic turbulent dynamo action is studied in the regime of small magnetic Prandtl numbers. An analysis based on the Kazantsev-Kraichnan model is used to establish the dynamo threshold and the dynamo growth rates for varying kinetic helicity of turbulent fluctuations. It is found that in contrast with the case of large magnetic Prandtl numbers, the kinematic dynamo action at small magnetic Prandtl numbers is significantly affected by kinetic helicity, and it can be made quite efficient with an appropriate choice of the helicity spectrum.

Stanislav Boldyrev
University of Wisconsin-Madison

Date submitted: 15 Jul 2011

Electronic form version 1.4