

Peer Review

Review of: "Parity Violation and Magnetic Helicity on Cosmological Scales: From Turbulent Baryogenesis to Galaxy Clusters"

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The paper investigates the role of parity violation in magnetic turbulent environments in the generation of large-scale magnetic fields during lepto/baryogenesis in the early Universe as well as in galaxy clusters. The numerical simulations are used to study the properties of such processes.

The paper contains quite interesting results important for the understanding of experimental data (measurements) as well as for further investigations.

In this respect, I would also like to draw the attention of the authors, e.g., to the following theoretical investigations (Theor. Math. Phys. 72 (1987), 940; Magnetohydrodynamics, 37 (2001), 80; Kinematics and Physics of Celestial Bodies 28 (2012) 225), where the generation of a magnetic field in helical fully developed turbulent magnetohydrodynamic systems is shown to be a natural process that stabilizes the system (turbulent dynamo).

Besides, I have the following recommendations and/or questions.

- For completeness, please describe (write) what the wavenumbers k_{β} and k_c in Eq.(1) and (2), respectively, are.
- How strongly do the obtained results depend on the model parameters?

For instance, the magnetic Prandtl number is taken to be equal to 1.

What can one expect when different values of this number are used?

- The used value of the Reynolds number (namely 1122) is quite small to consider the system as a fully developed turbulent system. What can one expect when significantly larger values of the Reynolds number are assumed?

Declarations

Potential competing interests: No potential competing interests to declare.