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## Anomalous Scaling in Compressible Kazantsev-Kraichnan Model with Spatial Parity Violation

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The field theoretic renormalization group and the operator product expansion are used for the investigation of the inertial-range anomalous scaling behaviour of the single-time correlation functions of the weak magnetic field within the framework of the compressible Kazantsev-Kraichnan rapid change model with spatial parity violation of the corresponding conductive turbulent environment. Two-loop expressions for the critical dimensions of the leading composite operators in the operator product expansion are found as functions of the compressibility and helicity parameters. Their influence on the hierarchy of the anisotropic contributions to the anomalous dimensions is discussed and it is shown that the crucial role is played by the composite operator near the isotropic shell in agreement with the Kolmogorov isotropy restoration hypothesis. It is shown that the presence of the helicity as well as that of the compressibility of the electrically conductive turbulent environment can have a nontrivial impact on the scaling properties of the correlation functions of the passive magnetic field, namely, to make the anomalous scaling more pronounced than in the incompressible and non-helical case.

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- [1] L. Ts. Adzhemyan, N. V. Antonov, A. N. Vasil'ev, Phys. Rev. E 58, 1823 (1998)
- [2] E. Jurcisinova, M. Jurcisin, J.Phys. A: Math. Theor. 45, 485501 (2012)

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