

[구IM-17] Rotation measure in a turbulent warm ionized medium

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In order to study correlation between fluctuations of magnetic field and density, we perform three-dimensional, isothermal, magnetohydrodynamic simulations that are designed for turbulent flows in the warm ionized medium with a sonic Mach number around unity. Contrary to a negative correlation expected from a constant total (gas and magnetic) pressure, there is a weak and positive correlation in our numerical experiments. Even though there is weak correlation, the field strength estimated based on the ratio of rotation and dispersion measures is consistent with intrinsic field strength in the experiment. We also find that the histogram of rotation measures can be well fitted by the Gaussian profile, and the width of a Gaussian fitting is proportional to the ratio of gas pressure to magnetic pressure. This relation may be useful to estimate the magnetic field strength in the WIM.

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