

Test particle energization of heavy ions in magnetohydrodynamic turbulence

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Abstract:

In the present work, we study the energization and displacement of heavy ions through the use of test particles interacting with turbulent electromagnetic fields obtained from pseudospectral direct numerical solutions of compressible three-dimensional magnetohydrodynamic (MHD) equations with a strong background magnetic field. We find the energization to be predominantly perpendicular as the ions become heavier, specially so for low-displacement particles. Using Voronoi tessellation, we analyze preferential concentration in order to propose a simple guide center model along with a mechanism to explain this behavior.

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References:

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