

Abstract Submitted
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Parallel and Perpendicular Diffusion of Cosmic Rays in Turbulent Plasmas: Analytical Theory and Simulation¹ MOHAMMAD HUSSEIN, ANDREAS SHALCHI, Univ of Manitoba, COSMIC RAY TRANSPORT TEAM — A fundamental problem in Space Science and Astrophysics is the interaction between energetic particles and a turbulent plasma. We have developed a test-particle code to simulate the interaction of charged particles with turbulent magnetic fields. Diffusion coefficients along and across the mean magnetic field are calculated and compared to different analytical theories. Different turbulence models were considered such as models with reduced dimensionality and full three-dimensional models. We have also included wave propagation effects. We explored the transport regimes in which the Bohm limit and the quasilinear limit are valid. We also shown that for perpendicular diffusion the so-called unified non-linear transport theory agrees very well with the numerical simulations.

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