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Cosmic-Ray Transport under the Influence of Non-linear Landau Damping

We present the first investigation of the role of non-linear Landau damping in self-generated cosmic-ray transport in conditions appropriate for the Galactic halo using hybrid particle-in-cell simulations. We find reduced CR drift speeds due to scattering, that however, remain super-Alfvénic due to damping. The non-linear Landau damping leads to heating of the background plasma and initiates an inverse cascade, producing perturbations on non-resonant large scales, a result with many potential implications for CR transport.

Collaboration(s)

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