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Electron Landau Damping in Simulated Dissipation Range Turbulence SARAH HORVATH, GREGORY HOWES, ANDREW MCCUBBIN, Univ of Iowa — Turbulence in astrophysical plasmas is thought to play a role in the heating of the solar wind, though many questions remain to be solved regarding the exact nature of the mechanisms driving this process in the heliosphere. In particular, the physics of collisionless interactions between particles and the electromagnetic fields in the dissipation range of the turbulent cascade remains incompletely understood. A recent analysis of an interval of Magnetosphere Multiscale (MMS) mission observations using the field-particle correlation technique found the first direct evidence for electron Landau damping in the dissipation range of the solar wind. Motivated by this discovery, we perform a high-resolution gyrokinetic simulation of the turbulence in the MMS interval to investigate the role of electron Landau damping in the dissipation of turbulent energy. We employ the field-particle correlation technique on our simulation data, compare the results to the known velocity-space signatures of Landau damping outside the dissipation range, and evaluate the net electron energization. We find qualitative agreement between the numerical and observational results for some key aspects of the energization, and speculate on the nature of disagreements in light of experimental factors, such as differences in resolution, and of developing insights into the nature of field-particle interactions in the presence of dispersive kinetic Alfvén waves.

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