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Landau Damping Signatures in Realistic and Down-Sampled Simulations of MMS Data: Characterizing the Use of Field-Particle Correlations SARAH HORVATH, GREGORY HOWES, University of Iowa, KRISTOPHER KLEIN, University of Michigan — Field-Particle Correlations, which reveal velocity-space signatures of particle energization mechanisms in turbulent plasma, are applied to a dataset generated by the Astrophysical Gyrokinetics Code (AstroGK), and patterned after plasma conditions encountered by the Magnetospheric Multiscale (MMS) probes while collecting 70 seconds of data on October 16th, 2015. In early 2019, the Field-Particle Correlation method was used on this MMS data interval to measure secular energy transfer from the electric field, and revealed a signature congruent with electron Landau damping. Here, we corroborate this 2019 result by using Field-Particle Correlations to look for Landau damping in a dataset simulated to mimic the conditions of this MMS interval, and thus create a direct link between the method's use on both observational and simulated data. Following this corroboration, we analyze the degree to which the Field-Particle Correlation method tolerates deliberate down-sampling in time resolution of the simulated data, evaluated by persistent ability to identify the signature of Landau damping. Knowledge of this limit assists in characterizing the applicability of Field-Particle Correlations to future space-based missions, including Parker Solar Probe.

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