Abstract Submitted
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Plasma Wave Echoes in a Weakly Collisional Plasma[1] C. BLACK, K. GERMASCHEWSKI, C.S. NG, A. BHATTACHARJEE, Center for the Integrated Computation and Analysis of Reconnection and Turbulence (CICART), University of New Hampshire, Durham, NH 03824 — It has been shown recently that weak collisions, which are a singular perturbation on the collisionless Vlasov equation, have a profound effect on the underlying spectrum for linear plasma waves by eliminating the Case-Van Kampen continuous spectrum and replacing it with a complete class of discrete eigenmodes [C.S. Ng, A. Bhattacharjee, F. Skiff, Phys. Rev. Lett. **83**, 1974 (1999); **92**, 065002 (2004).]. This discovery has important consequences for the validity of the classical theory of C. H. Su and C. Oberman [Phys. Rev. Lett. **20**, 427 (1968)] on the collisional decay of plasma wave echoes. We have developed a parallel one-dimensional Vlasov-Poisson system solver including the Lenard-Bernstein collision operator, and benchmarked this code with our earlier numerical results on the discrete spectrum. We have also completed simulations of plasma wave echoes in the collisionless system. We will report our results on the effect of collisions on the echoes, testing the theory of Su and Oberman, and present some novel features in echo dynamics caused by the discrete spectrum of collisional eigenmodes.

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