Abstract Submitted
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A PIC simulation study on the evolution of the real and imaginary frequencies of 1D plasma waves[1] THOMAS GRISMAYER, JAY FAHLEN, BENJAMIN WINJUM, FRANK TSUNG, GEORGE MORALES, WARREN MORI, UCLA TEAM — We use electrostatic PIC simulations to study the evolution of both the real and complex frequency of 1D plasma waves. We are considering especially the linear regime where the asymptotic damping rate is much bigger than the bounce frequency. In this regime the waves are typically very small and below the thermal noise. These waves can be studied using a subtraction technique where two simulations where identical random number generation seeds are carried out. In the first, a small amplitude wave is excited. In the second simulation no wave is excited. The results from each simulation are subtracted providing a clean linear wave that can be studied. As previously predicted, the damping is divided in two stages, an initial transient and an asymptotic decay (Landau's formula). The time-dependent resonant width measured in the simulations is compared with the theoretical prediction. In typical ICF plasmas $nl_d^3 <\sim 10^3$. Therefore, the number of resonant electrons can be small for linear waves. We will consider the effects of small numbers of resonant particles and their consequences of the observed damping.

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