Abstract Submitted
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**Squeeze Effects on Plasma Wave Damping**[1] A. ASHOURVAN, D.H.E. DUBIN, UCSD — We present a theory for the damping of cylindrically symmetric plasma modes due to a cylindrically symmetric squeeze potential of magnitude $\phi_s$ applied to the center of a non-neutral plasma column. Squeeze divides the plasma into passing and trapped particles; the latter cannot pass over the squeeze. Damping of the mode in collisionless theory is caused by Landau resonances at energies $E_n$ for which the bounce frequency $\omega_b(E_n)$ and the wave frequency $\omega$ satisfy $\omega = n\omega_n(E_n)$. Particles experience a non-sinusoidal wave potential along their bounce orbits due to the squeeze potential. As a result, squeeze induces bounce harmonics with $n \gg 1$ in the perturbed distribution. The harmonics allow resonances at energies $E_n \leq T$ and cause a substantial damping at phase velocities much larger than thermal velocity, which is not expected for unsqueezed plasma. In the regime $\omega/k \gg \sqrt{T/m}$ ($k$ is the wave number) and $T \gg \phi_s$, the resonance damping rate has a $\phi_s^2$ dependence. This behavior is consistent with the observed experimental results.

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