Abstract Submitted
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Electron Acoustic Waves in Pure Ion Plasmas[1] F. ANDEREGG, M. AFFOLTER, C.F. DRISCOLL, T.M. O'NEIL, UCSD, F. VALENTINI, U. Calabria (Italy) — Electron Acoustic Waves (EAWs) are the low-frequency branch of near-linear Langmuir (plasma) waves: the frequency is such that the complex dielectric function (D_r, D_i) has $D_r = 0$; and "flattening" of $f(v)$ near the wave phase velocity v_{ph} gives $D_i = 0$ and eliminates Landau damping. Here, we observe standing axisymmetric EAWs in a pure ion column.[2] At low excitation amplitudes, the EAWs have $v_{ph} \simeq 1.4\bar{v}$, in close agreement with near-linear theory. At moderate excitation strengths, EAW waves are observed over a range of frequencies, with $1.3\bar{v} < v_{ph} < 2.1\bar{v}$. Here, the final wave frequency may differ from the excitation frequency since the excitation modifies $f(v)$; and recent theory analyzes frequency shifts from "corners" of a plateau at v_{ph}.[3] Large amplitude EAWs have strong phase-locked harmonic content, and experiments will be compared to same-geometry simulations, and to simulations of KEEN[4] waves in HEDLP geometries.

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[2]F. Anderegg, *et al.*, Phys. Rev. Lett. **102**, 095001 (2009).
[3]F. Valentini et al., arXiv:1206.3500v1.
[4]B. Afeyan et al., Proc. Inertial Fusion Sci. and Applications 2003, A.N.S. Monterey (2004), p. 213.

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