Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

Large-amplitude acoustic streaming GREG CHINI, University of New Hampshire — A mechanism for the generation of large amplitude acoustically-driven streaming flows is proposed. Motivated by streaming observed in high-intensity discharge (HID) lamps, two-dimensional flow of an ideal gas in a channel geometry is analyzed in the asymptotic limit of high frequency forcing. Predictions of streaming flow magnitudes based on classical arguments invoking Reynolds stress divergences originating in viscous boundary layers are orders of magnitude too small to account for the observed mean flows. Moreover, classical "Rayleigh streaming" theory cannot account for the direction of the cellular mean flows often observed in HID lamps. In contrast, the inviscid mechanism proposed here, which invokes fluctuating baroclinic torques away from viscous and thermal boundary layers, can account both for the magnitude and the orientation of the observed streaming flows.

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Date submitted: 03 Aug 2011 Electronic form version 1.4