Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Vertically propagating driven dust acoustic waves in a dc glow discharge dusty plasma[1] E. THOMAS, J. WILLIAMS, L. MARCUS, Auburn University, R. MERLINO, University of Iowa — Early experimental and theoretical studies of these dust acoustic waves (DAW) have generally assumed that the kinetic dust temperature is comparable to that of the background ions and, as a result, finite dust temperature effects were not considered to play a significant role. However, a number of studies [e.g., J. Williams, et al., Phys. Plasmas, 14, 063702 (2007)] suggest that the kinetic dust temperature may be as high as tens of electron volts. This experimental study, in combination with work by Fisher, et al. (this session), shows that finite dust temperature effects modify the dust dispersion relation. In this study, monodisperse 1.51-micron diameter, silica microspheres are used to form a dusty plasma in an unmagnetized, argon dc glow discharge. Vertically propagating, driven DAW's are formed by modulating the current applied to the anode. Results will be presented on measurements of the dispersion relation and measurements of zero- and first-order wave components obtained using stereo-PIV techniques.

[1]This work is supported by NSF Grant PHY-0354938 (AU) and DOE Grant DE-FG02-04ER54795 (UI)

Edward Thomas
Auburn University

Date submitted: 25 Jul 2007 Electronic form version 1.4