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**Highly nonlinear dust acoustic waves and secondary dust density wave growth**[1] JONATHON HEINRICH[2], SU-HYUN KIM, JOHN MEYER, ROBERT MERLINO, University of Iowa, MARLENE ROSENBERG, University of California, San Diego — In a moderately coupled DC discharge dusty plasma, dust acoustic waves were excited by a modest ion drift. These dust acoustic waves grew to very large amplitude ($n_d/n_{d0}$ >2) and developed into highly nonlinear waves (with over 35% of the wave energy in the second harmonic). Dust particles in the presences of these high amplitude, nonlinear waves underwent large coherent particle displacement due to the nonlinear wave potential. As the displaced dust particles restored to their equilibrium positions, secondary dust density waves were excited in the wave troughs of the primary dust acoustic waves. The primary dust acoustic wave profiles were averaged and compared to second-order wave theory. The frequency and wavelengths of the secondary dust density waves are compared to a dust-dust streaming instability.

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