Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Characterization of single-file diffusion in one-dimensional dusty plasma W.L. THEISEN, T.E. SHERIDAN, Ohio Northern University — Single-file diffusion occurs in one-dimensional systems when particles cannot pass each other and the mean-squared displacement (msd) of these particles increases with time t. Diffusive processes that follow Ficks law predict that the msd increases as t, however, single-file diffusion is sub-Fickean meaning that the msd is predicted to increase as $t^{1/2}$. One-dimensional dusty plasma rings have been created under strongly coupled, over-damped conditions. Particle position data from these rings will be analyzed to determine the scaling of the msd with time. Results will be compared with predictions of single-file diffusion theory.

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Date submitted: 16 Jul 2010 Electronic form version 1.4