Two-dimensional diffusion in a self-heated dusty plasma DONALD
J. PLESHINGER, T.E. SHERIDAN, Ohio Northern University — We investigate
self diffusion in a dusty plasma using the Dusty Ohio Northern University exper-
imenT (DONUT). A two-dimensional liquid of about 100 dust particles is formed
at the center of, and heated by, a toroidal gas of dust particles confined in the
surrounding annular potential well. The motions of individual dust particles are
recorded, allowing particle trajectories to be directly observed. The mean-squared
displacement is found to increase linearly with time, in agreement with diffusion the-
ory. Dependence of the diffusion coefficients and probability distribution functions
on temperature will be presented.

Terrence Sheridan
Ohio Northern University

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