

Abstract Submitted
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Microscopic Characterization of Shocks in 2D Dusty Plasma¹ ANTON KANANOVICH, JOHN GOREE, University of Iowa — A dusty plasma is formed by immersing polymer microspheres in a glow-discharge plasma. Due to their size, the microspheres gain a large electric charge, so that they are strongly coupled. We report studies of shocks in a dusty plasma, under these strong-coupling conditions. We form a single 2D layer, which we observe using videomicroscopy with particle tracking analysis, yielding the positions and velocities of individual particles. We exploit this diagnostic to study the microscopic arrangement of the microspheres, as a shock passes through them. Starting with a crystalline microstructure, we excite a shock with a moving wire, and the shock melts the crystal. We investigated the spatio-temporal character of this melting using the particle-level data, by identifying defects using Voronoi and polygon analysis. Using the trajectories of individual particles in the vicinity of the shock, we plan to characterize the shock thickness and shock speed.

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