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Interaction of single-layer plasma crystals with upstream charged particles V. NOSENKO, C.-R. DU, S. ZHDANOV, H.M. THOMAS, G.E. MORFILL, Max Planck Institute for extraterrestrial Physics — In experiments with single-layer plasma crystals, one often observes extra particles outside of the main layer after injecting particles into plasma. Those particles, which can be agglomerates or contamination, sometimes move at a high speed and disturb the lattice. When the extra particle speed is higher than the sound speed of the lattice, the disturbance forms a Mach cone. The Mach cones and wakes associated with extra particles moving *beneath* the lattice layer are well studied. In the present work, we study for the first time the interaction of a single-layer plasma crystal with charged extra particles located *above* it (upstream of the flow of ions) [1]. Upstream extra particles tend to move between the rows of particles in the crystal, accelerate to supersonic speeds, and excite attraction-dominated Mach cones and wakes in the crystal. We attribute the particle - lattice layer attraction to the ion wake formed underneath the upstream extra particle.

[1] C.-R. Du, V. Nosenko, S. K. Zhdanov, H. M. Thomas, and G. E. Morfill, EPL 99, 55001 (2012).

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