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# Structural rearrangements in confinement-induced layering of quenched dusty plasma liquids

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Under confinement, liquids form layered structure adjacent to the flat surface. Previous investigations mainly focused on fractal-like behavior of layering front and 3D structure in the confined quenched liquid below the freezing point. However, the structural rearrangement and the associated micro-motion in the confined cold liquid still remain unexplored issues. In this work, we experimentally investigate the microstructure and micro-motion in confinement-induced layering of quenched dusty plasma liquid. It is found that the negatively charged micrometer-size dust particles form layered structures adjacent to the flat plasma sheath surface, which invades upward into the liquid phase after rapid quenching. The layered structure can be viewed as a 2+1D system of vertically coupled layers exhibiting triangular crystalline ordered domains with slow decay of long-range order. The intralayer particle alternatively exhibits caged rattling and cooperative hopping induced by constructive thermal perturbation. The different cooperative motions of adjacent layers change the horizontal shifts of the lattice lines and cause 3D structural rearrangement of 3D BCC, FCC, HCP structures with specific lattice orientations normal to the surface.