

Crystallization waves in complex plasma: molecular dynamics simulations.

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In our paper we review recent progress in understanding of crystallization processes in complex plasmas. Recently crystallization waves (CW) propagating through the plasma crystal were observed experimentally (Rubin-Zuzic et al, 2004). To analyze the crystallization processes we performed molecular dynamics (MD) simulations of a Yukawa system of particles using parameters similar to those of the experiment, including electrostatic collisions, gravity, neutral (Epstein) drag and neutral collision-induced Langevin forces. Our simulations show that agreement with the measured crystallisation front speed can only be obtained with full 3D simulations, so the process of crystallization is essentially three dimensional processes. Finally we discussed local order of particles behind the crystallization front.