

P4.3001 Molecular dynamics study of structural phase transition in a dusty plasma bilayer

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See full abstract here:

<http://ocs.ciemat.es/EPS2019ABS/pdf/P4.3001.pdf>

The crystalline bilayers formation in dusty plasma medium depicted by the Yukawa interaction amidst dust grains has been investigated using molecular dynamics simulations [1]. Charged dust grains are made to levitate in two distinct layers forming bilayer structures in the presence of a combined gravitational and external electric field force (representing the sheath field in experiments). The structural properties of these bilayer systems have been investigated in detail identifying them with the help of pair correlation functions and Voronoi diagrams. It has been shown that each of these crystalline layers undergo a structural phase transition from hexagonal (often also referred to as triangular) to square lattice configurations when the three-dimensional effects arising from the interaction amidst particles in different layers become important. By calculating the ensemble averaged angle between lattice vectors, it is shown that these structural transitions are completely re-entrant type.

1. Srimanta Maity and Amita Das, *Physics of Plasmas* 26, 023703 (2019).

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