

Geometry of sections and the arrangement of dust particles therein in a longitudinal magnetic field

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In volumetric plasma-dust formations, the particle arrangement and the influence of a magnetic field on it have been studied only in horizontal sections perpendicular to the magnetic field. The influence of a magnetic field is one of four possible ways to initiate a melting-type phase transition in a "plasma crystal." Furthermore, a strong magnetic field affects the discharge structure, changing the geometry of the plasma trap. In the case of rapid rotation of dust cross-sections, the particles in them rearrange themselves into circles. The dusty plasma is a system of nested coaxial cylinders.

This report presents some results of experimental observations, as well as calculations of the pair translation function based on observations in the range of moderate magnetic fields and local orientation order. In a strong magnetic field, the geometry of the structure changes significantly. However, traces of hexagonal symmetry are still visible in fields of the order of 1 T.

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