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STUDY OF THE DYNAMICS OF DUST STRUCTURES IN DIFFERENT PHASES OF STANDING STRATA IN A MAGNETIC FIELD *)

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This work examines the effect of variations in the ion flow (ion drag force [1,2]) on the mechanical state of dusty plasma in a longitudinal magnetic field. Dynamics of rotational motion and interparticle distances in a volumetric dust structure are studied in the range of magnetic induction when electrons are magnetized, but ions are not magnetized.

The ion flows are most intense in the used dust trap in the standing stratum, in its phase close to the maximum concentration of ions and electrons. Result of the action of an ambipolar ion flow in an axial magnetic field on horizontal dust sections is considered. The experimental conditions correspond to work [3], in which two types of particles, 5 μm and 8 μm, are held in a volumetric trap. These conditions are suitable for retaining dust granules of 5 μm size in two inert gases, neon and argon, at the same discharge parameters (pressure and current). Replacing the working gas leads to change in both the strength of ion drag (due to a change in the mass of ions) and the density of the ion flow and the charge of the dust particle.

The obtained experimental data on the rotation velocity and interparticle distance were analyzed taking into account changes in plasma parameters in different gases [4] and in different phases of the stratum [5].

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