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# FEATURES OF DUST STRUCTURES DYNAMICS IN A STRONG MAGNETIC FIELD IN VARIOUS INERT GASES *)

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Dusty plasma [1] in a strong magnetic field is a difficult object to create, but it exhibits a number of unique properties [2-5]. Its main studies were carried out in monolayer dust formations in argon [2-3]. The dynamics of rotation in a volumetric dust structure in a glow discharge in neon was studied in [5]. The results obtained in the region of weak magnetic fields repeated the previous data [6], however in strong fields (above 0.1 T) the results differed somewhat in different discharge chambers, gas types and pressures.

This report discusses several series of experiments with dusty plasma in a strong magnetic field of up to 2.5 T carried out in a direct current discharge in a dust trap (described earlier in [5-6]) in the region of a sharp short narrowing of the current channel. The experiments were performed with three inert gases: neon, argon and helium. Discharge conditions (current, pressure, trap geometry) were selected for each gas. Under selected conditions trends of dust plasma rotation dynamics were obtained, which were analyzed and compared with each other.

Qualitatively, the rotation velocity trend appears to be as follows. After the formation of dusty plasma in a field of 0.015 T, rotation develops with an angular velocity; the vector of it is oppositely directed to the magnetic induction vector. In a field of the order of 0.1 T there is a local velocity maximum, the interpretation of which is given in [5]. The experiments carried out show that depending on the conditions (type of gas, discharge current) a further increase in the magnetic field leads either to the velocity dependence becoming constant or to its slight increase. But when the magnetization of the discharge ions is achieved the rate of change in the rotation velocity from the magnetic field increases significantly in all the discharge gases under study.

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