The effect of a magnetic field on dust particle charge

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Applying an external magnetic field is a common method for influencing dusty plasma. Dust structures created in dust traps within glow discharge strata rotate in an external magnetic field. To date, dependences of the angular velocity of dust structure rotation on magnetic field induction up to 2 T have been obtained.
According to probe theory, under current experimental conditions, a decrease in dust particle charge and a change in rotation velocity should be expected. An analysis of the rotation dynamics of dust structures conducted in this study demonstrates that the charge remains constant. Numerical estimates of charge change in a strong magnetic field were made. The obtained data are confirmed by independent experiments in an rf discharge in a field of 6 T.
This research was supported by the Russian Science Foundation (grant No. 22-72-10004-П, https://rscf.ru/project/22-72-10004-П).