

**Generalization of a Störmer problem for dust grain with the effect
of a quadrupolar magnetic term**

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Abstract

In this work, we will investigate the generalized Störmer problem for a charged dust grain near a rotating spherical magnetic planet with the effect of a quadrupolar magnetic term with a simultaneous influence of electromagnetic and gravitational forces. Furthermore, the equilibrium state of these dust grains is treated here with a detailed discussion of equatorial and Halos orbits existence conditions with analytical and numerical solutions.