

Abstract Submitted
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Theoretical and experimental studies of dust particle charging in the presence of a magnetic field¹ CHRIS FICHTL, GIAN LUCA DELZANNO, Los Alamos National Lab, SU-HYUN KIM, ROBERT MERLINO, University of Iowa, GIOVANNI LAPENTA, KU-Leuven — The physical process of the charging of a dust particle immersed in a plasma with an applied background magnetic field is studied theoretically and experimentally. The theoretical study is conducted by means of a spherical harmonics expansion of the Maxwell-Boltzmann equations. Furthermore, we perform PIC simulations of a single particle immersed in a plasma subject to static background magnetic fields of various magnitudes to obtain characteristic charging curves. From this point, various detailed physics packages are added to the PIC code for more accurate simulations. Experiments are being planned in which single micron-size dust particles are dropped into a magnetized Q machine plasma where they become charged and subsequently fall into a Faraday cup where their charge is measured. Charge measurements will be performed at different values of the magnetic field.

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