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Low velocity Ion Stopping in Strongly Magnetized Plasmas
CLAUDE DEUTSCH, ROMAIN POPOFF, LPGP Université Paris XI, MAGNETIZED PLASMA COLLABORATION — We focus attention on the low velocity ion slowing down(LIVSD)at projectile velocity Vp<Vthe in the target electron plasma with arbitrary density Ne and submitted to a steady homogeneous magnetic intensity B of any strength. In order to circumvent several basic conceptual difficulties encountered with the usual binary collisions-dielectric two-pronged approach for the specific and highly significant parallel and orthogonal orientations w.r.t magnetic field, we initiate an analytical and hydrodynamic derivation of magnetized LIVSD based on particle diffusion coefficients in arbirary magnetized one- component-plasmas(OCP). In the B=0 limit, we recover the usual expected results. We proceed to a parameter study involving B- and temperature T-dependence in two extreme cases of presently hot current interest. First, we consider the very dense and sometimes extremely magnetized hot plasms envisioned for fast ignition in ICF with B 10^{10} G. Then, we turn to ultracold and highly dilute electron plasmas used for ion beam cooling at CERN. In both situations the electron Larmor radius<Debye length. Pertaining analytical LIVSD are presented.

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