

Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Sorting Category: 1.0.0 (T)

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 $V_p < V_{the}$ in the target electron plasma with arbitrary density N_e 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 arbitrary 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 plasmas envisioned for fast ignition in ICF with $B \sim 10^{10}$ 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.

Prefer Oral Session
 Prefer Poster Session

Claude Deutsch
claude.deutsch@u-psud.fr
LPGP Université Paris XI

Date submitted: 15 Jul 2008

Electronic form version 1.4