DEMOCRITUS code: A kinetic approach to the simulation of complex plasmas NIMLAN ARINAMINPAT, OCIAM-Oxford, UK, CHRIS FICHTL, LANL, LEONARDO PATACCHINI, MIT, GIOVANNI LAPENTA, GIAN LUCA DELZANNO, LANL — The DEMOCRITUS code is a particle-based code for plasma-material interaction simulation. The code makes use of particle in cell (PIC) methods to simulate each plasma species, the material, and their interaction. In this study, we concentrate on a dust particle immersed in a plasma. We start with the simplest case, in which the dust particle is not allowed to emit. From here, we expand the DEMOCRITUS code to include thermionic and photo emission algorithms and obtain our data. Next we expand the physics processes present to include the presence of magnetic fields and collisional processes with a neutral gas. Finally we describe new improvements of the code including a new mover that allows for particle subcycling and a new grid adaptation approach.

Giovanni Lapenta
Los Alamos National Lab

Date submitted: 25 Jul 2006   Electronic form version 1.4