Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Monte Carlo TRIM simulations, with evolving target and surface morphology, in support of plasma simulations and devices KYLE LINDQUIST, CPMI, Department of Nuclear, Plasma and Radiological Engineering, University of Illinois at Urbana-Champaign, Urbana 61801, DAVIDE CURRELI, Department of Nuclear, Plasma and Radiological Engineering, University of Illinois at Urbana-Champaign, Urbana 61801, KISHOR KALATHIPARAMBIL, DAVID RUZIC, CPMI, Department of Nuclear, Plasma and Radiological Engineering, University of Illinois at Urbana-Champaign, Urbana 61801 — Simulations using fractal and dynamic versions of the BCA code TRIM (Fractal TRIDYN) are reported. The sputtering yields from the simulations are being used to support experiments and simulations of plasma devices. The use of linear plasma scenarios can provide an intermediate point of understanding before attempting full tokamak systems. Specifically, we are targeting experiments, like those at PISCES-B, of light, low energy ions (H/D/T/He) incident on beryllium targets. The sputtering yield of Be by D and He has been shown at PISCES-B to be about 6 and 13 times smaller, respectively, than traditional TRIM results would predict. We show what combinations of surface roughness, target composition, and incident ion composition can produce the observed sputtering yields. The current model for sputtering in the SOLPS code uses the Bohdansky formula. The surface roughness feature of Fractal TRIDYN can be used to improve upon this. Shown are database results and the rough surface fitting parameters that are being used to implement an improved curve fit for the Bohdansky model.

Kyle Lindquist
CPMI, Department of Nuclear, Plasma and Radiological Engineering,
University of Illinois at Urbana-Champaign, Urbana 61801

Date submitted: 11 Jul 2014 Electronic form version 1.4