Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Characterization of Secondary Electron Emission Properties of Plasma Facing Materials[1] MARLENE I. PATINO, University of California, Los Angeles, ANGELA M. CAPECE, YEVGENY RAITSES, Princeton Plasma Physics Laboratory, BRUCE E. KOEL, Princeton University — The behavior of wall-bounded plasmas is significantly affected by the plasma-wall interactions, including the emission of secondary electrons (SEE) from the wall materials due to bombardment by primary electrons. The importance of SEE has prompted previous investigations of SEE properties of materials especially with applications to magnetic fusion, plasma thrusters, and high power microwave devices. In this work, we present results of measurements of SEE properties of graphite and lithium materials relevant for the divertor region of magnetic fusion devices. Measurements of total SEE yield (defined as the number of emitted secondary electrons per incident primary electron) for lithium are extended up to 5 keV primary electron energy, and the energy distributions of secondary electrons are provided for graphite and lithium. Additionally, the effect of contamination on the total SEE yield of lithium was explored by exposing the material to water vapor. Auger electron spectroscopy (AES) was used to determine surface composition and temperature programmed desorption (TPD) was used to determine lithium film thickness. Results show an order of magnitude increase in total SEE yield for lithium exposed to water vapor.

[1]This work was supported by DOE contract DE-AC02-09CH11466; AFOSR grants FA9550-14-1-0053, FA9550-11-1-0282, and AF9550-09-1-0695; and DOE Office of Science Graduate Student Research Program.

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Date submitted: 24 Jul 2015 Electronic form version 1.4