

Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Effect of Li coatings on coarse-grained W exposed to high flux He plasmas at high temperatures¹ ANTON NEFF, JEAN PAUL ALLAIN, University of Illinois, THOMAS MORGAN, FOM-DIFFER (Dutch Institute for Fundamental Energy Research) — Tungsten is appealing as a plasma facing component (PFC) because of its high sputter threshold, high melting temperature, and good thermal conductivity. However, when exposed to He ions at low energy and high flux, like those in a tokamak divertor, the surface microstructure changes detrimentally, creating bubbles, holes, and fuzz. Recent studies show that adding impurities (C and Be) to the He plasma can inhibit the growth of fuzz. Additionally, lithium as a PFC coating in multiple tokamaks has improved plasma performance. We investigated the effect that a thin ~ 500 nm Li coating had on the formation of these surface defects in W. Samples were exposed in the linear plasma device Magnum PSI, at fluxes of $\sim 1024 \text{ m}^{-2}\text{s}^{-1}$ and $T_{surf} > 700^\circ\text{C}$. After irradiation, the surface of the samples were characterized with scanning electron microscopy (SEM). These results will be presented along with XPS and SIMS results investigating the survivability of the Li coating under these conditions.

¹This work is supported by US DOE Contracts: DE-SC0010717 and DE-SC0010719.

Anton Neff
University of Illinois

Date submitted: 11 Jul 2014

Electronic form version 1.4