Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

**Effect of Damaging Temperature on Deuterium Retention in Tungsten** MICHAEL SIMMONDS, Center for Energy Research, UC San Diego, YONGQIANG WANG, Materials Science and Technology, Los Alamos National Laboratory, RUSS DOERNER, JOSEPH BARTON, MATTHEW BALDWIN, GEORGE TYNAN, Center for Energy Research, UC San Diego — Fusion-relevant displacement damage in W and its influence on D retention is explored. Ferroni identified three recovery stages for damaged W near 623, 913, and 1253 K [1], and post-damage annealing at elevated temperature before or during plasma exposure has shown a reduction in D retention [2]. In this work 2 and 5 MeV Cu ions were first used to produce up to 0.2 dpa damage in W samples under various temperatures ranging from 773 to 1273 K that were then exposed to D plasma at 383 K to a fluence of $10^{24}$ ions/m$^2$. Subsequent Nuclear Reaction Analysis and Thermal Desorption Spectrometry show that increased temperature during damage creation reduces D retention more than published post-damage annealing [2]. Experimental results and initial modeling work will be reported.

[1] F. Ferroni et al., Acta Materialia 90, 380-393 (2015)
[2] M.H.J. 't Hoen et al., Nucl. Fusion 53, 043003 (2013)

Michael Simmonds
Center for Energy Research, UC San Diego

Date submitted: 24 Jul 2015 Electronic form version 1.4