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**Reduced Deuterium Retention in Simultaneously Damaged and Annealed Tungsten** MICHAEL SIMMONDS, Center for Energy Research, UC San Diego, YONGQIANG WANG, Materials Science and Technology, Los Alamos National Laboratory, RUSSELL DOERNER, JOSEPH BARTON, MATTHEW BALDWIN, GEORGE TYNAN, Center for Energy Research, UC San Diego, CENTER FOR ENERGY RESEARCH, UC SAN DIEGO COLLABORATION, MATERIALS SCIENCE AND TECHNOLOGY, LOS ALAMOS NATIONAL LABORATORY COLLABORATION — Fusion relevant displacement damage performed at elevated temperature in tungsten (W) and its influence on deuterium (D) retention is explored. Displacement damage performed in room temperature W allows defects to effectively become frozen-in. In this work, 5 MeV Cu ions produced up to 0.2 dpa damage in W samples at various temperatures up to 1243 K were subsequently exposed to D plasma at 383 K to a fluence of 10ˆ24 ions/mˆ2. Subsequent Nuclear Reaction Analysis (NRA) and Thermal Desorption Spectrometry (TDS) show that increased temperature during damage creation reduces D retention. TDS clearly shows that the Cu ion induced traps are annealed and approach intrinsic concentrations as the simultaneous damage/heating approaches 1243 K. Lastly, analysis of the TDS data is shown to provide an estimate of 0.09 eV for the recovery activation energy, similar to the mobility energy calculated for self-interstitial atoms (SIA).

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