

Abstract Submitted
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Broad Distribution of Traps in Metallic Plasma Facing Components J. GUTERL, R.D. SMIRNOV, S.I. KRASHENINNIKOV, University of California, San Diego — In the vacuum vessel of the ITER device, plasma facing components will be exposed to various plasma conditions that will alter both surface and bulk of material [1], affecting dynamic plasma wall interactions (PWI). In most studies of retention processes involved in PWI, hydrogen outgasing is not well reproduced in the context of long-pulse plasma operation regimes, due to small number of hydrogen traps considered. In this work, we model hydrogen outgasing from metallic wall with a large number of traps. We identify two regimes of outgasing from the material bulk depending on trapping energy and two regimes of hydrogen desorption from material surface, which depend on hydrogen concentration. Modeling of thermodesorption experiments performed on W samples implanted with D at high fluences reveals broad distributions of traps. Effects of such broad trap distributions on hydrogen outgasing are discussed. Work is performed under the auspices of USDOE Grant No. DE-FG02-04ER54739 and the PSI Science Center Grant DE-SC0001999 at UCSD.

[1] R.A. Causey, J. Nucl. Mater. 300 (2002) 91

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