

Abstract Submitted  
for the DPP13 Meeting of  
The American Physical Society

**In-situ real time measurements of net erosion rates of copper during hydrogen plasma exposure** LEIGH KESLER, GRAHAM WRIGHT, ETHAN PETERSON, DENNIS WHYTE, Massachusetts Institute of Technology — In order to properly understand the dynamics of net erosion/deposition in fusion reactors, such as tokamaks, a diagnostic measuring the real time rates of net erosion/deposition during plasma exposure is necessary. The DIONISOS experiment produces real time measurements of net erosion/deposition by using Rutherford backscattering spectroscopy (RBS) ion beam analysis simultaneously with plasma exposure from a helicon plasma source. This in-situ method improves on ex-situ weight loss measurements by allowing measurement of possible synergistic effects of high ion implantation rates and net erosion rate and by giving a real time response to changes in plasma parameters. Previous work has validated this new technique for measuring copper (Cu) erosion from helium (He) plasma ion bombardment. This technique is now extended to measure copper erosion due to deuterium and hydrogen plasma ion exposure. Targets used were a 1.5  $\mu\text{m}$  Cu layer on an aluminum substrate. Cu layer thickness is tracked in real time using 1.2 MeV proton RBS. Measured erosion rates will be compared to results from literature and He erosion rates. Supported by US DoE award DE-SC00-02060.

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Date submitted: 12 Jul 2013

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