

Abstract Submitted  
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**In-Situ Plasma Surface Interaction Diagnostics for Magnetic Fusion** SOREN HARRISON, DENNIS WHYTE, University of Wisconsin - Madison — The real-time in-situ diagnosis of plasma surface interaction (PSI) processes, such as erosion, deposition and fuel retention, are presented. Such diagnostics are mostly absent in present fusion devices, but are necessary to improve our understanding of PSI toward the design and operation of ITER. Two in-situ PSI diagnostics are examined. Quartz-microbalances (QMB) are being installed in the DIII-D inner divertor for spring '06 operation. The QMBs will measure neutral particle (C) deposition behind protective tile gaps on a shot-to-shot basis. Deposition will be monitored over entire shot cycles, and during bakes. Development of a new Alpha Radiation Remote Ion Beam Analysis (ARRIBA) diagnostic for use in magnetic confinement devices is ongoing. ARRIBA will provide depth-resolved measurement of elemental concentrations and hydrogenic fuel retention on tile surfaces exposed to high local heat loads, such as the divertor. Both the QMBs and ARRIBA will allow erosion/deposition/retention measurements to be correlated with plasma conditions. Quartz Microbalance work supported by U.S. DOE.

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