Abstract Submitted
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Dynamic retention and deposition in NSTX measured with quartz microbalances[1] C.H. SKINNER, H.W. KUGEL, A.L. ROQUEMORE, Princeton Plasma Physics Laboratory, R. MAINGI, Oak Ridge National Laboratory, W.R. WAMPLER, Sandia National Laboratory. — Dynamic retention of deuterium has been observed in NSTX with three quartz crystal microbalances. These are deployed in plasma shadowed areas at the upper and lower divertor and outboard midplane and enable spatially localized measurements of the pulse-by-pulse material gain and loss with a sensitivity of a fraction of an atomic monolayer. At the time of a plasma discharge a transient increase in mass of order 0.1 μg/cm^2 is seen. This decays in the interpulse period to a level either higher, lower or similar to that prior to the discharge. Following a days plasma operations a loss in mass is observed over several hours that parallels the deuterium outgassing from hydrocarbon deposits on the plasma facing components. For the first discharge of the day, the relatively unsaturated hydrocarbon layer shows a step-up in mass independent of plasma conditions. Some correlations of mass gain with plasma duration, stored energy, and change in the plasma shape are observed. The results are interpreted in terms of dynamic retention and erosion/deposition.

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Charles Skinner
Princeton Plasma Physics Laboratory

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