Abstract Submitted
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Initial results and operation of the Materials Analysis Particle Probe (MAPP) on NSTX-U[1] FELIPE BEDOYA, JEAN PAUL ALLAIN, Univ of Illinois - Urbana, ROBERT KAITA, MATHEW LUCIA, Princeton Plasma Physics Laboratory, FILIPPO SCOTTI, Lawrence Livermore National Laboratory, CHARLES SKINNER, Princeton Plasma Physics Laboratory, UNIVERSITY OF ILLINOIS TEAM, PRINCETON PLASMA PHYSICS LABORATORY COLLABORATION — Understanding the plasma-wall interaction remains a critical issue for magnetic fusion. The mechanisms controlling NSTX-U plasma performance by lithium conditioning of graphite are not completely understood. MAPP is the first in-vacuo surface-sensitive compositional/chemical analysis diagnostic to elucidate plasma-material interactions at a tokamak plasma edge. MAPP enables inter plasma-shot in-vacuo diagnosis of PFCs positioned in the outboard divertor far SOL of NSTX-U. The diagnostic provides surface composition during the time scale of plasma-induced modification in the critical region of incident hydrogen implantation. MAPP can expose four samples to plasma discharges and retract them to its chamber for analysis. MAPP's capabilities include XPS, TDS, LEISS and DRS. This work summarizes the commissioning of MAPP for the NSTX-U FY15 experimental campaign. NSTX-U will use boronization and lithiumization sequentially to prepare its graphite PFCs. MAPP will carry four samples; two ATJ graphite, one TZM and one gold sample that will be exposed to the same conditioning as the walls of the tokamak. XPS and TDS data collected during the procedures will document the progressive modification of the walls in NSTX-U.

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