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Commissioning of an ECR Plasma Source for Lithium Surface Science Studies and Initial Results RYAN NORVAL, University of Wisconsin - Madison, ANGIE CAPECE, Princeton Plasma Physics Lab, OLUSEYI FARORANTI, Princeton University, CHARLES SKINNER, Princeton Plasma Physics Lab, BRUCE KOEL, Princeton University — Lithium-conditioned plasma facing components reduce hydrogen recycling in plasmas by readily forming hydride compounds, which results in improved plasma confinement and performance. A new ultrahigh vacuum (UHV)-compatible electron cyclotron resonance (ECR) plasma source, which allows surface spectroscopic studies, was recently commissioned at the Princeton Plasma Physics Laboratory to study the uptake of deuterium by lithium coatings on single crystal molybdenum as a precursor to NSTX experiments. The ECR plasma source is capable of delivering deuterium ions to the surface at energies of 50-2000 eV and current densities between 0.05 and 2.0 mA/cm^2. Surface science studies will be performed on clean Li films on Mo(100) substrates before and after D+ irradiation under UHV conditions at base pressures of 10^{-10} Torr. X-ray photoelectron spectroscopy will be used to determine the chemical state of lithium, and thermal desorption spectroscopy will be used to measure the amount of deuterium retained in the sample as a function of ion fluence and temperature.

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