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Upgrades to the Materials Analysis and Particle Probe for the next NSTX-U campaign HANNA SCHAMIS, CAMILO JARAMILLO, JEAN PAUL ALLAIN, Pennsylvania State University — Boron and lithium conditioning of plasma-facing components have both improved plasma performance in previous NSTX campaigns. Controlled laboratory experiments have shown that oxygen plays a role in hydrogen retention in B and Li. This may contribute to low recycling regimes that improve plasma performance. In the next NSTX-U campaign, boronization will be the first conditioning technique used, followed by lithium conditioning. The interactions of these mixed layers with H and O is not well understood and needs to be further explored. In addition, more research needs to be done on the link between plasma performance and wall conditioning. In order to contribute to these pending surface science questions, the Materials Analysis and Particle Probe (MAPP) will be reinstalled with upgraded capabilities. These include a new hemispherical analyzer, which will improve the energy resolution of the acquired data. This will allow for better operation of diagnostics, as well as more detailed stoichiometric data of the B or Li layers. Additionally, a new custom-designed in situ quartz microbalance will allow for real-time measurements of material deposition and erosion at the MAPP location. These surface measurements will benefit modeling and understanding of wall conditioning.

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