

Abstract Submitted
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Overview of NSTX Research Operations and Facility Upgrades¹

MASAYUKI ONO, Princeton University, NSTX TEAM — The National Spherical Torus eXperiment (NSTX) facility has been routinely operating with lithium wall coating, yielding record plasma parameters and improved operational efficiency. In 2010, its Liquid Lithium Divertor (LLD) was commissioned. The interactions of the outer SOL plasma with lithium evaporated on the molybdenum surface of the LLD have been investigated for a wide range of surface temperatures. The carbon core accumulation was observed to be reduced with the LLD surface above the lithium melting temperature but there was also no significant molybdenum influx observed, even with the strike point directly on the LLD. For the 2011-12 experimental campaign, a row of molybdenum tiles was installed inboard of the LLD for experiments with both strike points on lithiated molybdenum surfaces. Other new facility and diagnostic systems were implemented to support the research program in all plasma science areas. For the longer term, a new center stack and associated structural enhancements are being prepared, together with a second NBI system, to achieve 5 s operation at $B_t = 1$ T and $I_p = 2$ MA to enable low-collisionality, non-inductively driven scenarios to provide the database needed for a compact fusion neutron science facility.

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