Abstract Submitted
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Collaborative Research and Development on Liquid Metal Plasma Facing Components[1] M.A. JAWORSKI, T. ABRAMS, R. ELLIS, A. KHODAK, B. LEBLANC, J. MENARD, M. ONO, C.H. SKINNER, D.P. STOTLER, Princeton Plasma Physics Laboratory, G. DETEMMERMAN, M.A. GLEESON, A.R. LOF, J. SCHOLTEN, M.A. VAN DEN BERG, H.J. VAN DEN MEIDEN, FOM-DIFFER, T.K. GRAY, Oak Ridge National Laboratory, S.A. SABBAGH, Columbia University, V.A. SOUKHANOVSKII, Lawrence Livermore National Laboratory, J. HU, L. WANG, G. ZUO, ASIPP — Liquid metal plasma facing components (PFCs) provide the potential to avoid component replacement by continually replenishing the plasma-facing surface. Data during the NSTX liquid lithium divertor (LLD) campaign indicate that impurity accumulation on the static lithium resulted in a mixed-material surface. However, no lithium ejection nor substrate influx was observed during normal operation. This motivates research on flowing systems for near-term machines. Experiments on the Magnum-PSI linear test-stand and EAST tokamak have begun to explore issues related to near-surface lithium transport, surface evolution and coating lifetime for exposures of 5-10s. Technology development for a fully-flowing liquid lithium PFC is being conducted including construction of a liquid lithium flow loop and thermal-hydraulic studies of novel, capillary-restrained lithium PFCs for possible use on EAST and NSTX-U.

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