

Abstract Submitted
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Design considerations for NSTX-U high-Z divertor upgrade and future liquid metal PFCs¹ MICHAEL JAWORSKI, K. TRESEMER, A. BROOKS, S. GERHARDT, R. KAITA, J. MENARD, J. NICHOLS, M. ONO, R. MAINGI, Princeton Plasma Physics Laboratory, P. RINDT, N. LOPES-CARDOZO, TU/Eindhoven, T. GRAY, Oak Ridge National Laboratory — A clear comparison between plasma-facing components composed of high-Z solid metals versus low-Z liquid lithium fusion device is sought to experimentally demonstrate integrated, high-performance scenarios in the spherical tokamak configuration. The NSTX-U is beginning a staged upgrade of the in-vessel PFCs to high-Z metal to accomplish this experimental program. The first high-Z divertor upgrade will consist of the installation of a continuous toroidal row of molybdenum tiles in the outboard divertor of the machine. The experimental program is designed to test the heat-flux handling capabilities of these bulk metal tiles and assess the impact of the high-Z tiles on plasma operations. Incremental upgrades toward flowing liquid lithium systems are also envisioned with one possible embodiment being pre-filled, liquid lithium, self-replenishing PFCs. Design and analysis of the base tiles and pre-filled target tiles will be presented.

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