Abstract Submitted
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Status and Progress of the Domestic Liquid Metal Plasma-Facing Component Design Program[1] R. MAINGI, A. KHODAK, E. KOLEMEN, PPPL, C.E. KESSEL, J. JUN, J.D. LORE, B.A. PINT, D.L. YOUCHISON, ORNL, S. SMOLENTSEV, UCLA, D. ANDRUCZYK, D. CURRELI, UIUC — A new domestic liquid metal plasma-facing component (PFC) design program was initiated in FY2020. We are examining a flowing liquid lithium divertor design for a well-documented Fusion Nuclear Science Facility, which was the subject of a prior liquid metal PFC evaluation [C.E. Kessel et al., *Fusion Sci. Techn.* **75** (2019) 886]. Presently we are evaluating the heat flux exhaust capability as a function of flow speed, initially at the maximum Li temperature about 450 ^{o}C, i.e. below the evaporative limit. The design calculations include liquid lithium magneto-hydrodynamic flow via computational fluid dynamics, and plasma response to the liquid lithium PFCs including SOLPS scrape-off layer and divertor plasma, and kinetic sheath calculations. This activity includes experiments on liquid lithium flow and material compatibility characteristics, such as wetting, dryout, corrosion, erosion, embrittlement, etc. Experimental facilities at ORNL, PPPL, and UI-UC are used for these studies. An overview of the PFC design calculations and the supporting experimental studies, some of which are used to validate the models, will be presented.

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