

Abstract Submitted
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Experimental development of a lithium vapor box for Magnum-PSI¹ J. A. SCHWARTZ, E. D. EMDEE, R. J. GOLDSTON, Princeton University — The lithium vapor box divertor is a possible solution for the fusion power exhaust challenge. The extreme but narrow heat flux of a divertor plasma would be dissipated by a localized gas of lithium, which ionizes and radiates to cool the plasma until recombination. Before implementation on a tokamak, the concept will be tested using the linear plasma facility Magnum-PSI, which produces a 3 cm diameter (FWHM) beam of 5 eV plasma that can deliver a continuous 10 MW per meter squared heat flux to a target. In these experiments, the beam will be passed through a cylindrical box filled with lithium vapor at up to 20 Pa and 650 degrees Celsius. As the amount of lithium vapor is varied, the power deposited at the target and profiles of heat flux to the box will be measured. Concepts for the design of the box, including methods of limiting the lithium efflux to the main chamber, details of experimental procedures, and diagnostics are presented.

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