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FLIT: Flowing LIquid metal Torus*[1] EGEMEN KOLEMEN, Princeton University, RICHARD MAJESKI, RAJESH MAINGI, PPPL, MICHAEL HVASTA, Princeton University — The design and construction of FLIT, Flowing LIquid Torus, at PPPL is presented. FLIT focuses on a liquid metal divertor system suitable for implementation and testing in present-day fusion systems, such as NSTX-U. It is designed as a proof-of-concept fast-flowing liquid metal divertor that can handle heat flux of 10 MW/m2 without an additional cooling system. The 72 cm wide by 107 cm tall torus system consisting of 12 rectangular coils that give 1 Tesla magnetic field in the center and it can operate for greater than 10 seconds at this field. Initially, 30 gallons Galinstan (Ga-In-Sn) will be recirculated using 6 jxB pumps and flow velocities of up to 10 m/s will be achieved on the fully annular divertor plate. FLIT is designed as a flexible machine that will allow experimental testing of various liquid metal injection techniques, study of flow instabilities, and their control in order to prove the feasibility of liquid metal divertor concept for fusion reactors. *This work is supported by the US DOE Contract No. DE-AC02-09CH11466.

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