Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Active Radiative Liquid Lithium Divertor for Handling Transient High Heat Flux Events[1] MASAYUKI ONO, Princeton Plasma Physics Laboratory, ROGER RAMAN, University of Washington, NSTX-U TEAM — The extreme heat flux anticipated in fusion reactor divertor plasma facing components (PFCs) is perhaps the most challenging technology issue for fusion energy development. Most divertor PFCs are designed based on the maximum steady-state operational limits. However, in addition to the high steady-state heat flux, the fusion reactor divertor PFCs could also experience significant transient heat flux such as ELMs and/or other magnetic reconnection events which can deposit large transient heat flux onto the divertor PFCs. If unprotected, it could damage the divertor PFC surfaces which could lead to a highly undesirable unplanned shutdown for PFC repair and/or replacement. In this presentation, we explore feasibility of active radiative liquid lithium divertor concepts for protecting the divertor PFCs from the extreme transient heat flux while maintaining the normal plasma operations. We also suggest a possible implementation technique using inductive pellet injector for the reactor PFC protection from transient heat flux which can be tested on NSTX-U.

[1]This work supported by DoE Contract No. DE-AC02-09CH11466

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Date submitted: 24 Jun 2020 Electronic form version 1.4