

Abstract Submitted
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A gas-puff-driven theta pinch for plasma-surface interaction studies SOONWOOK JUNG, LEIGH KESLER, HYUN-HO YUN, DAVIDE CURRELI, DANIEL ANDRUCZYK, DAVID RUZIC, University of Illinois at Urbana-Champaign — DEVeX is a theta pinch device used to investigate fusion-related material interaction such as vapor shielding and ICRF antenna interactions with plasma-pulses in a laboratory setting. The simulator is required to produce high heat-flux plasma enough to induce temperature gradient high enough to study extreme conditions happened in a plasma fusion reactor. In order to achieve it, DEVeX is reconfigured to be combined with gas puff system as gas puffing may reduce heat flux loss resulting from collisions with neutral. A gas puff system as well as a conical gas nozzle is manufactured and several diagnostics including hot wire anemometer and fast ionization gauge are carried out to quantitatively estimate the supersonic flow of gas. Energy deposited on the target for gas puffing and static-filled conditions is measured with thermocouples and its application to TELS, an innovative concept utilizing a thermoelectric-driven liquid metal flow for plasma facing component, is discussed.

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