

Abstract Submitted
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Upgrade of a Theta Pinch Plasma Source for Energetic Plasma Flow Generation¹ SOONWOOK JUNG, DANIEL ANDRUCZYK, DAVID RUZIC, University of Illinois at Urbana Champaign, CENTER FOR PLASMA-MATERIAL INTERACTIONS TEAM — 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. However, recent upgrades of the device indicate that guiding magnet and crowbar operation hinder plasma flow to the target when the magnetic field at the theta coil is reversed from that of the guiding magnet. This reversal occurs mainly due to finite inductance and resistance at the crowbar switch. Therefore, an upgrade for more suitable fusion-related material study is required. In this study, several upgrades to produce higher-temperature plasma have been carried out. Major modification of theta coil is carried out and its effects on plasma parameters are theoretically predicted with simulation. The results will be compared with experiments including voltage/current measurement at the coil, plasma parameter measurement with triple Langmuir probe and time of flight technique, and incident energy measurement with thermocouples.

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