

Abstract Submitted  
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**Study of temperature evolution in NIMROD simulations of SSPX**<sup>1</sup> L.L. LODESTRO, B.I. COHEN, L. DIVOL, E.B. HOOPER, Univ. Cal. Lawrence Livermore Nat. Lab. — The sustainment of current in the core of a toroidal plasma by electrostatic edge-current drive requires the radial transport of current across imperfect magnetic surfaces. Tight coupling between surface-breaking MHD fluctuation activity and temperature evolution has been observed in NIMROD simulations of SSPX [1]. Its sensitivity with respect to physical ( $Z_{\text{eff}}$ , density, viscosity, anisotropy of the thermal conductivity) and numerical parameters is examined here. One simulation, with high, fixed bank-current, run to nearly an L/R time, exhibits apparent steady-state cycles with time-averaged sustainment: intervals of closed surfaces and peaked temperature profiles, punctuated by short bursts with voltage spikes and open surfaces. The energy-confinement properties of this simulation will be presented. [1] B.I. Cohen, E.B. Hooper, et al., Phys. Plasmas 12, 056106 (2005).

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