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**Multipulsed edge-current drive in a spheromak** L.L. LODESTRO, B.I. COHEN, E.B. HOOPER, H.S. MCLEAN, T.L. STEWART, R.D. WOOD, Lawrence Livermore National Laboratory — Flux amplification ( $A$ )—the ratio of poloidal magnetic flux enclosed by a spheromak’s toroidal core-plasma to an applied edge flux—is a critical parameter for an economic spheromak-based fusion reactor. In [1], experimental measurements of  $A$  in SSPX found good agreement with numerical studies [2] carried out with the NIMROD code over a range of “extended formation” discharge parameters. However, SSPX appeared to be limited to  $A \sim 3$  while the simulated  $A$  continued to rise with increasing gun-current ( $I_{\text{gun}}$ ). Early experiments with the SSPX modular capacitor bank, on the other hand, gave some indication that  $dI_{\text{gun}}/dt$  also played a role and that, perhaps, multiple pulses with faster current swings in both directions could build magnetic field more efficiently. Experiments to explore this were, however, limited by gun discharge circuit inductance. In this paper we investigate the effect numerically using multipulse scenarios in the SSPX geometry with NIMROD.

[1] B. Hudson et al., Phys. Plasmas **15**, 056112 (2008).

[2] E.B. Hooper et al., Nucl. Fusion **47**, 1064 (2007).

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