

Abstract Submitted  
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**Measurements and models of spheromak formation at SSPX**<sup>1</sup> C.A. ROMERO-TALAMAS, J. ORTIZ, O.O. OHIA, D.N. HILL, H.S. MCLEAN, R.D. WOOD, E.B. HOOPER, J.M. MOLLER, Lawrence Livermore National Laboratory, Livermore, CA 94550 — Two hypotheses of spheromak formation with coaxial helicity injection are being investigated at SSPX. The first hypothesis comprises the formation of multiple magnetic reconnection sites prior to relaxation; in the second hypothesis an initial plasma column kinks at least twice and need only reconnect at a single site to form the spheromak. Two numerical tools are used to study formation, as well as steer the design of a new probe that will search for reconnection in the SSPX flux conserver. The first tool is NIMROD, a 3D resistive MHD code that simulates SSPX plasma evolution. The second is a program that solves for the magnetic field from current-carrying magnetic flux ropes with a wide range of conjectured shapes, from straight ropes, to complex knots. Virtual probes in these models are compared to experimental measurements from an insertable probe and probes at the flux conserver wall, and to flux rope shapes inferred from high-speed images.

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