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Measurements of spheromak formation and field buildup at SSPX using a double magnetic probe array C.A. ROMERO-TALAMAS, O.O. OHIA, R. JAYAKUMAR, Lawrence Livermore National Laboratory, Livermore, CA 94550, SSPX TEAM — A specially designed magnetic probe consisting of two linear arrays that measure Bx, By, and Bz, is being used to investigate magnetic evolution during spheromak formation, and during multiple gun current pulses on top of a baseline current at SSPX. The measurements reveal that at the start of each pulse there is a time lag in the magnetic response of the closed flux region, while the open flux (intercepting the gun electrodes) responds immediately. This is interpreted as the time to build enough helicity on the open flux, before reconnecting and adding flux to the closed surfaces. Magnetic reconstructions after pulsed buildup using CORSICA show good agreement with the data. A code that simulates the magnetic field from current-carrying flux ropes is used to reproduce the field measured during flux buildup. The code includes an optimization routine that finds the rope shape that best fits the data in order to estimate helicity in the open flux. Work performed under the auspices of the US DOE by University of California Lawrence Livermore National Laboratory under contract W-7405-ENG-48.

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