Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

Design of a combination ion saturation/triple probe for fast plasma measurements[1] KEVIN GILMORE, IVAN ARNOLD, MARK CIANCIOSA, EDWARD THOMAS, Auburn University, JOSEPH JOHNSON III, KYRON WILLIAMS, CHARLES WEATHERFORD, Florida A&M University — This presentation details the design and construction of an in-situ probe diagnostic system for the FAMU Spheromak Turbulent Plasma Experiment (STPX). A spheromak is a confined, magnetized plasma configuration that is created when a "gun" injects the plasma from an electrode and into a confinement area - the flux conserver - where it self-organizes into a toroidal shape. This self-organized plasma typically lasts for less than 200 microseconds, and so any diagnostics must be able to operate on very fast time scales. The probe is a linear array that consists of a triple Langmuir probe at the tip and three cylindrical probes along the length of the assembly. This probe is designed to make simultaneous measurements of the ion saturation current, as well as the floating potential, plasma potential, electron temperature, and electron density plasma. This presentation will give a summary of the development process for this probe system: from the initial pulsed plasma experiment to the final probe design for STPX. Preliminary data from STPX may also be presented.

[1]This project is supported by the U.S. Department of Energy.

Edward Thomas
Auburn University

Date submitted: 16 Jul 2012 Electronic form version 1.4