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4P39 - The Design, Properties, Operation and Modeling of the STPX Plasma Device

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The Spheromak Turbulence Physics Experiment (STPX), a new large diameter (1.5 m) gun injected spheromak confinement system, has been constructed recently at FAMU for use originally in studying equilibrium, reconnection, turbulence, dust transport, and astrophysical phenomena, and for diagnostic probe development. We present details on its design, construction, operation, performance parameters and on its suite of diagnostic devices. Diagnostics to measure plasma parameters, electric and magnetic fields, particle flux and optical emission will be described in detail. STPX has many access ports which, along with its large volume, makes possible many new flexible experimental configurations. Ongoing results of a new computation model we developed to study particle dynamics in the injector gun will be discussed. Studies are underway to design a research campaign to adapt this laboratory device to study topics related to high energy density science. This university facility is being used to train students in the basics of plasma physics that can be useful to them in larger fusion, high energy density science, and astrophysically-related laboratories.

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Author: WILLIAMS, R. (Florida A. & M. University)

Co-authors: CLARK, J.; RICHARDSON, M.; EVANS, S.; OLOGUNOGBA, D.; AGHEDO, A.; TITUS, J.; WEATHERFORD, C.

Presenter: WILLIAMS, R. (Florida A. & M. University)

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