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**Overview of the Pulsed High Density (PHD) FRC Experiment***
GEORGE VOTROUBEK, JOHN SLOUGH, SAMUEL ANDREASON, HIROSHI GOTA, Plasma Dynamics Laboratory, University of Washington, RICHARD MILROY, University of Washington — Experimental studies are under way on the Pulsed High Density experiment (PHD) that will expand the conventional regime of the Field Reversed Configuration (FRC) to the very compact, high energy density regime to approach fusion. Initial studies explore pre-ionization and formation methods used to create high flux FRCs. By utilizing FRCs formed in a smaller, higher density regime, the requirement on the FRC closed poloidal flux is no greater than what has already been achieved; however, higher initial flux will require less final compression (i.e. lower confining field) to achieve fusion conditions. The high flux FRC source is designed to enable the completion of scaling and confinement studies (determined by the ratio of $S_*$, separatrix radius/ion skin depth, to E, the elongation) by enabling the ability to program FRC elongation. The ultimate goal of PHD is to form, accelerate and compress an FRC to a density of $1\text{x}10^{22}$ $\text{m}^{-3}$ at a temperature greater than 1 keV. Following energy confinement time predicted by previous FRC scaling, the resulting FRC would have an $n\tau_E$ product $\sim 5\text{x}10^{18}$ $\text{m}^{-3}\text{s}$. An overview of the experimental plan and basic approach to fusion conditions will be presented. *Research funded by the DOE Office of Fusion Energy Sciences.

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