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**Initial Pre-ionization and Formation Results from the Pulsed High Density (PHD) Experiment\*** SAMUEL ANDREASON, HIROSHI GOTA, GEORGE VOTROUBEK, JOHN SLOUGH, Plasma Dynamics Laboratory, University of Washington — The Pulsed High Density (PHD) experiment will form Field Reversed Configuration (FRC) plasmas that are accelerated and compressed to near fusion conditions. PHD has begun initial operations concentrated on forming a FRC with the necessary characteristics for acceleration. This source section is required to produce a FRC with an initial trapped flux greater than 10 mWb and initial plasma inventory greater than  $5.5 \times 10^{20}$  ions. Thus far, the experimental emphasis has been on pre-ionization, formation and rotation. Source FRCs have been formed with the initial plasma provided by an axial electric field breakdown. The effects of Rotating Magnetic Field (RMF) on ionization and rotation are being studied. It is hoped that the RMF can spin up the plasma in a direction opposite to that produced by theta pinch FRC formation. A visible light spectrometer with a helium/deuterium gas fill will allow us to measure this rotation. RMFs have been studied on this experiment in the frequency range of 25 kHz to 400 kHz, bracketing the ion gyro-frequency in the RMF field. Additional methods are available for ionization including ringing theta- pinch and a Cascaded Arc Source. The efficacy of ionization techniques will be determined by a HeNe interferometer and neutral pressure measurement. \*Research funded by the DOE Office of Fusion Energy Sciences.

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