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High Flux FRC Facility for Stability, Confinement, and ITER Divertor Studies JOHN SLOUGH, RICHARD MILROY, GEORGE VLASES, University of Washington — In order to advance the FRC concept into a more fusion-like regime, the existing RPPL facility at the University of Washington will be modified to take full advantage of the new FRC formation methodology of dynamic formation and merging of FRCs. This method has been shown to provide appreciable increases in the key parameters of ion temperature, poloidal flux and FRC lifetime. A key goal of the high flux FRC facility (HFF) will be to form FRCs with poloidal fluxes sufficiently large to fully confine high energy ion orbits ($\sim$ 10 keV). Rapid injection of plasma with a highly directed energy will be investigated as a method to provide this kinetic component early in the formation phase to maintain FRC stability. The HFF will also be used to make significant contributions towards solving critical problems that hinder the tokamak concept. The FRC exhaust flow will be directed to targets at energy density levels equivalent to those expected in ITER ELM activity and disruptions for materials studies. The FRC experiments will also provide a valuable test bed for code validation in a high beta regime, with large two-fluid effects, plasma flows and an energetic minority species.

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