

Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Development of Diagnostics for the Livermore DPF Devices¹

JAMES MITRANI, RAHUL R PRASAD, YURI A PODPALY, CHRISTOPHER M COOPER, STEVEN F CHAPMAN, BRIAN H SHAW, ALEXANDER P POVILUS, ANDREA SCHMIDT, LLNL — LLNL is commissioning several new diagnostics to understand and optimize ion and neutron production in their dense plasma focus (DPF) systems. Gas fills used in DPF devices at LLNL are Deuterium (D_2) and He accelerated onto a Be target, for production of neutrons. Neutron yields are currently measured with Helium-3 tubes, and development of yttrium-based activation detectors is currently underway. Neutron time-of-flight (nTOF) signals from prompt neutrons will be measured with gadolinium-doped liquid scintillators. An ion energy analyzer will be used to diagnose energy distribution of D^+ and He^{+2} ions. Additionally, a fast frame ICCD camera has been applied to image the plasma sheath during the rundown and pinch phases. Sheath velocity will be measured with an array of discrete photodiodes with ns time responses. A discussion of our results will be presented.

¹Prepared by LLNL under Contract DE-AC52-07NA27344, and supported by the Laboratory Directed Research and Development Program (15-ERD-034) at LLNL and the Office of Defense Nuclear Nonproliferation Research and Development within U.S. Department of Energy.

James Mitrani
LLNL

Date submitted: 14 Jul 2017

Electronic form version 1.4