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Optimizing Dense Plasma Focus Neutron Yields with Fast Gas Jets MATTHEW MCMAHON, CHRISTOPHER KUENY, ELIZABETH STEIN, ANTHONY LINK, ANDREA SCHMIDT, Lawrence Livermore National Laboratory — We report a study using the particle-in-cell code LSP to perform fully kinetic simulations modeling dense plasma focus (DPF) devices with high density gas jets on axis. The high density jet models fast gas puffs which allow for more mass on axis while maintaining the optimal pressure for the DPF. As the density of the jet compared to the background fill increases we find the neutron yield increases, as does the variability in the neutron yield. Introducing perturbations in the jet density allow for consistent seeding of the m=0 instability leading to more consistent ion acceleration and higher neutron yields with less variability. Jets with higher on axis density are found to have the greatest yield. The optimal jet configuration is explored. This work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

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