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Progress in Development of Dense Plasma Focus Pinch for AmBe Radiological Source Replacement STEVE FALABELLA, ALEX POVILUS, ANDREA SCHMIDT, JENNIFER ELLSWORTH, ANTHONY LINK, JASON SEARS, DREW HIGGINSON, SHENG JIANG, Lawrence Livermore Natl Lab — A dense plasma focus (DPF) is a compact plasma gun accelerator that can produce intense, high energy ion beams (multiple MeV). These ion beams could be used to replace radiological sources for a variety of applications. Using a 2kJ DPF with a helium gas fill, alpha particles are accelerated into a beryllium target in order to generate a neutron spectrum similar to an AmBe source. We report on initial observations of neutron yields for this system and efforts to optimize and improve repeatability of pinch performance. In particular, incorporating results from newly-developed kinetic LSP simulations, we demonstrated higher neutron yields by adjusting the geometry of the anode electrode. In addition, we present preliminary measurements for energy distributions of ions accelerated by the pinch. This work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344. This work supported by US DOE/NA-22 Office of Non-proliferation Research and Development.

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