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Preionization Techniques in a kJ-Scale Dense Plasma Focus¹ ALEXANDER POVILUS, BRIAN SHAW, Lawrence Livermore Natl Lab, STEVE CHAPMAN, Alameda Applied Sciences Corporation, YURI PODPALY, CHRISTOPHER COOPER, STEVE FALABELLA, RAHUL PRASAD, ANDREA SCHMIDT, Lawrence Livermore Natl Lab — A dense plasma focus (DPF) is a type of z-pinch device that uses a high current, coaxial plasma gun with an implosion phase to generate dense plasmas. These devices can accelerate a beam of ions to MeV-scale energies through strong electric fields generated by instabilities during the implosion of the plasma sheath. The formation of these instabilities, however, relies strongly on the history of the plasma sheath in the device, including the evolution of the gas breakdown in the device. In an effort to reduce variability in the performance of the device, we attempt to control the initial gas breakdown in the device by seeding the system with free charges before the main power pulse arrives. We report on the effectiveness of two techniques developed for a kJ-scale DPF at LLNL, a miniature primer spark gap and pulsed, 255nm LED illumination.

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