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10.20 Development of a multi-pinhole point-backlit-radiography source

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Laser-irradiating a foil to create a radiation source is a common procedure in high-energy-density experiments. Foil radiation sources are used to drive physical phenomena or diagnostics - such as radiography. Radiography images measure the reduction in intensity of a radiation source through an object, which implies a line-integrated density. Point backlit radiography requires that a pinhole is placed between the laser-irradiated foil and the object to image. The pinhole size and placement controls radiation uniformity, image magnification and resolution. However, point backlit radiography is limited by the amount of data it can collect, typically one image per axis.We present our first design and results from a multi-pinhole backlit radiography source. The pinholes coexist on the same substrate and are independently triggered 2 ns apart. A 100 micron titanium wall separates the pinholes on the laser irradiated substrate.This work is funded by the U.S. DOE, through the NNSA-DS and SC-OFES Joint Program in HEDPLP, grant No. DE-NA0002956, and the NLUF Program, grant No. DE-NA0002719, and through LLE, University of Rochester by the NNSA/OICF under Cooperative Agreement No. DE-NA0001944. This work is funded by the Lawrence Livermore National Laboratory under subcontract B614207.

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