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Developmental Status of a Liquid-Freon Bubble Chamber for Neutron Imaging M.C. GHILEA, D.D. MEYERHOFER, T.C. SANGSTER, D.J. LONOBILE, A. DILLENBECK, Laboratory for Laser Energetics, U. of Rochester, R.A. LERCHE, LLNL, L. DISDIER, CEA, France — In inertial confinement fusion (ICF) ignition experiments it is important to distinguish failure mechanisms of the imploding capsule and unambiguously diagnose compression and hot-spot formation in the burning fuel. A neutron image of the imploded core can be used to infer both drive symmetry and final core compression/convergence. To provide additional options for imaging on the NIF, a high-resolution, reduced line-of-sight detector is being developed at LLE. The detector is based on a high-pressure freon bubble chamber. With bubble diameters in the range of 100 μm, the achieved spatial resolution is significantly better than more conventional pixilated arrays. The higher spatial resolution can be utilized to significantly shorten the neutron flight path. The status of the bubble chamber and the optical-readout-system development will be discussed. Initial bubble growth data will be presented. This work was supported by the U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement No. DE-FC52-92SF19460.

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