

Abstract Submitted  
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**Long Duration Multi-hohlraum X-ray Sources for Eagle Nebula Laboratory Experiments**<sup>1</sup> JAVE KANE, ROBERT HEETER, DAVID MARTINEZ, Lawrence Livermore National Laboratory, ALEXIS CASNER, CEA/DAM/DIF, BRUNO VILLETTE, CEA, ROBERTO MANCINI, University of Nevada, MARC POUND, University of Maryland — A novel foam-filled multi-hohlraum long-duration x-ray source has been demonstrated at the Omega EP laser and used to obtain L-band spectra of photoionized Ti. A larger scale version of the source will be used in the Science on NIF Eagle Nebula experiments studying dynamic evolution of distinctive pillar and cometary structures in star-forming clouds, where the long duration and directionality of photoionizing radiation from nearby stars generates new classes of flows and instabilities. At NIF, a target representing an astrophysical molecular cloud will be placed several mm from an x-ray source lasting 40–100 ns. At EP, three hohlraums were illuminated in sequence with 3.3 kJ pulses lasting 6 ns, or 4.3 kJ pulses lasting 10 ns, generating 18 or 30 ns of x-ray output at 90–100 eV color temperature. Performance of the source was validated using the  $\mu$  DMX and VSG spectrometers, ASBO VISAR, and x-ray pinhole imagery. The HYDRA code suggests the EP-scale source can also be shot at NIF with at least 10 kJ per hohlraum. The multi-hohlraum source concept has potential further application to hard x-ray sources, soft x-ray backlighters, and nonlinear ablative hydrodynamics.

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Jave Kane  
Lawrence Livermore National Laboratory

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