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Characterization of a Long Duration X-ray Source for Laboratory Photoionized Plasmas in Steady-State[1] RYAN SCHOENFELD, ROBERTO MANCINI, DAN MAYES, KYLE CARPENTER, JEFFREY ROWLAND, University of Nevada, Reno, ROBERT HEETER, DUANE LIEDAHL, Lawrence Livermore National Laboratory, SEAN REGAN, Laboratory for Laser Energetics - University of Rochester — Long duration, i.e. tens of ns, broadband x-ray sources are important for driving photoionized plasma experiments in steady-state relevant to astrophysics. In a series of experiments performed at the OMEGA EP laser, we have used the Gatling-Gun x-ray source to produce a 30ns x-ray drive with a 90-eV radiation temperature. The Gatling-Gun source consists of three TPX-foam filled Cu-hohlraums. By driving each hohlraum sequentially with a 10ns square pulsed 4.4kJ UV laser beam we have achieved the 30ns-duration broadband x-ray source[1]. A long duration x-ray source is paramount to produce laboratory photoionized plasmas in steady-state. We present measurements of the performance of the Gatling-Gun x-ray source recorded in multiple experiment series with the VISAR, SOP and 4ω-probe diagnostics as well as a grating spectrometer in order to characterize the energy content and spectral distribution of the Gatling-Gun x-ray flux, respectively. We also discuss radiation-hydrodynamic and view factor simulations to interpret the data, and model a photoionzed plasma experiment produced by the x-ray flux. [1]D. Martinez, 2017 Annual OLUG Workshop.

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