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Radiation temperature measurement of a long duration x-ray source for steady-state laboratory photoionized plasma experiments[1]
RYAN SCHOENFELD, ROBERTO MANCINI, DANIEL MAYES, University of Nevada, Reno, ROBERT HEETER, DUANE LIEDAHL, Lawrence Livermore National Lab, SEAN REGAN, Laboratory for Laser Energetics — Long duration, i.e. tens of ns, broadband x-ray sources are important for steady-state laboratory photoionized plasma experiments relevant to astrophysics. In a series of experiments performed at the OMEGA EP laser facility, we have used the Gatling-Gun source to produce an x-ray drive that lasts for 30ns with a radiation temperature T_r =90eV. The Gatling-Gun source is comprised of three Cu hohlraums; each is filled with TPX foam and driven by a separate 10ns square pulsed laser beams with 4.4kJ of UV laser energy[2]. The total source duration of 30ns is achieved by driving the three hohlraums sequentially in time. The radiation temperature was monitored with a VISAR diagnostic over a series of shots to check performance and consistency, and compare with previous miniDMX data[3]. We present measurements of the radiation temperature obtained from VISAR data from two series of experiments performed at OMEGA EP, in conjunction with radiation-hydrodynamics simulations of the VISAR diagnostic package.

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[2]D. Martinez, 2017 Annual OLUG Workshop.
[3]miniDMX reference

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