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Characterization of ultrashort pulse laser-produced miniature hohlraum XUV sources ANDREW MCKELVEY, ANTHONY RAYMOND, CALVIN ZULICK, ANATOLY MAKSIMCHUK, JOHN NEES, VICTOR YANOVSKY, VLADIMIR CHVYKOV, ALEXANDER THOMAS, KARL KRUSHELNICK, Univ of Michigan - Ann Arbor — Experiments at the National Ignition Facility (NIF) allow the radiative properties of dense, high-temperature matter to be studied at previously unreachable regimes, but are limited by cost and system availability. A scaled down system using ultra-short laser pulses and delivering energy to a much smaller hohlraum could be capable of reaching comparable energy densities by depositing the energy in a significantly smaller volume before ablation of the wall material closes the cavity. The laser is tightly focused through the cavity and then expands to illuminate the wall with an intensity closer to that of a long pulse laser. Experiments were performed on a number of short-pulse Ti:sapphire tabletop laser systems. Targets include cavities machined in bulk material using low laser powers, and then shot in situ with a single full power pulse as well as micron scale pre-fabricated targets. Spectral characteristics were measured using a flat-field soft X-ray spectrometer and a seven channel filtered photo cathode array. These broadband EUV sources may allow opacity and atomic physics measurements with plasma and radiation temperatures comparable to NIF type hohlraums, but with a significantly higher repetition rate and in a university scale system.

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