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Development of short pulse laser driven micro-hohlraums as a source of EUV radiation[1] KARL KRUSHELNICK, THOMAS BATSON, ANDREW MCKELVEY, ANTHONY RAYMOND, ALEC THOMAS, VICTOR YANOVSKY, JOHN NEES, ANATOLY MAKSIMCHUK, University of Michigan
— Experiments at large scale laser facilities such as NIF allow the radiativ properties of dens, high-temperature matter to be studied at previously unreachable regime, but are limited by cost and system availability. A scaled system using a short laser pulses and delivering energy to much smaller hohlraum could be capable of reaching comparable energy densities by depositing the energy in a much smaller volume before ablation of the wall material closes the cavit. The laser is tightl focused through the cavity and then expands to illuminate the wall. Experiments were performe using the Hercules Ti:Sapphire laser system at Michiga. Targets include cavities machined in bulk material using low laser power, and then shot in situ with a single full power pulse as well as micron scale pre-fabricate target. Spectral characteristics were measured using a soft X-ray spectromete, K-alpha x-ray imaging system and a filtered photo cathode array. Scalings of the radiation temperature were made for variations in the hohlraum cavit, the pulse duration as well as the focusing conditions. Proof of principle time resolved absorption spectroscopy experiments were also performe. These sources may allow opacity and atomic physics measurements with plasma an radiation temperatures comparable to much larger hohlraums, but with much higher repetition rate and in a university scale laboratory.

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