

Abstract Submitted
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Measuring the temperature history of isochorically heated warm dense metals¹ CHRIS MCGUFFEY, University of California San Diego, J KIM, UCSD, J PARK, J MOODY, J EMIG, B HEETER, LLNL, M DOZIERES, FN BEG, UCSD, HS MCLEAN, LLNL — A pump-probe platform has been designed for soft X-ray absorption spectroscopy near edge structure measurements in isochorically heated Al or Cu samples with temperature of 10s to 100s of eV. The method is compatible with dual picosecond-class laser systems and may be used to measure the temperature of the sample heated directly by the pump laser or by a laser-driven proton beam Knowledge of the temperature history of warm dense samples will aid equation of state measurements. First, various low- to mid-Z targets were evaluated for their suitability as continuum X-ray backlighters over the range 200-1800 eV using a 10 J picosecond-class laser with relativistic peak intensity Alloys were found to be more suitable than single-element backlighters. Second, the heated sample package was designed with consideration of target thickness and tamp layers using atomic physics codes. The results of the first demonstration attempts will be presented. This work was supported by the U.S. DOE under Contract No. DE-SC0014600

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