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Electron dynamics in WDM with x-ray pump/x-ray probe at LCLS BENJAMIN BARBREL, ROGER FALCONE, Univ of California - Berkeley, PHIL HEIMANN, SIEGFRIED GLENZER, SLAC, ALESSANDRA RAVA-SIO, LULI, ERIC GALTIER, SLAC, KYLE ENGELHORN, LBL, HYUN-KYUNG CHUNG, AIEA, GIULIO MONACO, Univ. Trento, ALISON SAUNDERS, Univ of California - Berkeley, LUKE FLETCHER, JEROME HASTINGS, SLAC, ULF ZASTRAU, Jena, MAC MACDONALD, WILL SCHUMAKER, MAXENCE GAU-TIER, HAE JA LEE, BOB NAGLER, ELISEO GAMBOA, SLAC — Recent machine developments at LCLS have led to the capability for the FEL to deliver two x-ray pulses separated both in time and photon energy. This enables x-ray pump/xray probe experiments to be performed to study the ultrafast dynamics of electrons in warm dense matter (WDM) plasmas. Such experiments open a window over the first tens of femtoseconds of the time evolution of non-equilibrium electronic distribution in dense plasmas. We recently conducted an LCLS-MEC experiment in which thin metallic foils where irradiated with two x-ray pulses. The first x-ray pulse isochorically heats up the material, and the second one probes the electronics properties of the sample in the first 100fs of its evolution via x-ray Thomson scattering. In this presentation I will discuss the first results of this experiments as well as the potential of x-ray pump/x-ray probe experiments for WDM science.

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