

Abstract Submitted  
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**Time-resolved x-ray imaging of x-ray induced dynamics in Xe clusters**<sup>1</sup> M. BUCHER, Argonne, K. FERGUSON, T. GORKHOVER, S. CARRON, J. CRYAN, J. KRZYWINSKI, A. LUTMAN, A. MARINELLI, SLAC, C. BACELLAR, A. CHATTERLEY, M. ZIEMKIEWICZ, LBNL, C. BERNANDO, L. GOMEZ, C. JONES, J KWOK, R.M.P. TANYAG, USC, M. MUELLER, D. RUPP, T. MÖLLER, TU Berlin, O. GESSNER, LBNL, A. VILESOV, USC, C. BOSTEDT, Argonne — Nanoparticles irradiated by intense x-ray pulses from the LCLS free-electron laser are immediately transformed into a highly excited nanoplasma. Within the first few femtoseconds of the x-ray pulse the particles are ionized and on longer time scales they disintegrate due to Coulomb forces. We performed an x-ray pump / x-ray probe experiment to investigate how the nanoplasma creation and disintegration changes the particles diffraction response. As samples we used pristine Xe clusters as well as Xe clusters embedded in He droplets. The data show that for pristine clusters the higher diffraction orders diminish first and vanish completely as the nanoplasma expansion progresses. This effect is less prominent in the embedded clusters. We compare our results to previous studies on optically pumped clusters (T. Gorkhober et al., Nat. Photonics, 2016).

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