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Size dependent ionization dynamics of argon clusters in intense x-ray pulses SEBASTIAN SCHORB, M. SWIGGERS, SLAC National Accelerator Laboratory, D. RUPP, Technische Universitaet Berlin, R. COFFEE, M. MESSERSCHMIDT, S. MÖLLER, G. WILLIAMS, J. BOZEK, SLAC National Accelerator Laboratory, T. OSIPOV, Western Michigan University, S. WADA, Hiroshima University, O. KORNILOV, Max Born Institut, T. MÖLLER, Technische Universitaet Berlin, C. BOSTEDT, SLAC National Accelerator Laboratory — Free Electron Lasers open the door for novel experiments in many science areas ranging from ultrafast chemical dynamics to single shot imaging of molecules. For the success of virtually all experiments with free electron lasers a detailed understanding of the light - matter interaction in the x-ray regime is pivotal. The Linac Coherent Light Source (LCLS) free electron laser in Stanford allows for the first time to study inner shell ionization dynamics of intense x-ray pulses on a femtosecond time scale. We performed experiments on the ionization dynamics of Argon clusters at different pulse length using the slotted spoiler foil in the second LCLS bunch compressor [1]. The Auger rate of argon clusters is predicted to be size dependent and lower than in atoms due to delocalization of the valence electrons [2]. We observe a dependence of the ionization dynamics on pulse length and cluster size. The results are discussed and also compared to recent atomic and molecular data from LCLS.

[1] P. Emma et al. PRL 92, 074801 (2004)
[2] U. Saalmann, JM Rost, PRL 89, 14 (2002)

Sebastian Schorb
SLAC National Accelerator Laboratory

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