Abstract Submitted
for the DAMOP20 Meeting of
The American Physical Society

Real-time dynamics of the formation of hydrated electrons upon irradiation of water clusters with XUV light AARON LAFORGE, NORA BERRAH, University of Connecticut, RUPERT MICHIELS, FRANK STIENKEMEIER, Freiburg University, VIT SVOBODA, AARON VON CONTA, HANS JAKOB WOERNER, ETH Zurich, MICHELE DI FRAIA, OKSANA PLEKAN, KEVIN PRINCE, CARLO CALEGARI, Elettra-Sincrotrone, ANDREW CLARK, VERONICA OLIVER, MARCEL DRABBELS, EPFL Lausanne — Here, we report on the formation of the hydrated electron in real-time using XUV-UV pump-probe photoelectron spectroscopy. The XUV pulse, from a free electron laser, initially ionizes the water clusters resulting in the creation of low kinetic energy electrons. Through elastic and inelastic scattering, some of the electrons are trapped within the cluster forming bound, hydrated states. With a second UV pulse, we probe the process in time recording the resulting electron kinetic energy distribution. By varying the UV pulse, we map out the hydration process in time and determine the formation as well as decay times in the low picosecond range and simultaneously observe the formation of free, excited hydrogen atoms as a fast, dominant radiation product. This work was funded by the Carl-Zeiss-Stiftung and the Chemical Sciences, Geosciences, and Biosciences Division, Office of Basic Energy Sciences, Office of Science, U.S. Department of Energy, grant No. DE-SC0012376.

Aaron LaForge
University of Connecticut

Date submitted: 31 Jan 2020 Electronic form version 1.4