Abstract Submitted
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Ultrafast Photoelectron Imaging of Energy Transfer Dynamics in Excited Doped Helium Nanodroplets[1] CATHERINE SALADRIGAS, CHRISTIAN CLAUDIO, NATHAN HELVY, DANIEL M. NEUMARK, University of California Berkeley, OLIVER GESSNER, Lawrence Berkeley National Lab — Doped helium nanodroplets are an excellent system to study solvent-dopant interactions. Droplets are a unique solvent that are both relatively simple in electronic structure, as compared to molecular solvents, and intriguing due to their superfluid ground state properties. We are interested in studying energy and charge transfer mechanisms from the excited droplet environment to dopant atoms and molecules, and how these mechanisms compete with internal droplet relaxation mechanisms. Energy transfer to a noble gas dopant in an electronically excited droplet has been observed in static experiments. With a sufficiently high droplet excitation energy, the energy transfer results in indirect ionization of the dopant. In a complimentary femtosecond time-resolved experiment, we want to gain a better understanding of the physics underlying the host-dopant energy transfer mechanisms. Using a high harmonic generated XUV pulse to electronically excite the droplet and a UV probe pulse to deplete the energy transfer signal, we can detect the photoelectrons produced from the energy transfer with velocity map imaging as a function of pump-probe time delay. Based on the modulation of the photoelectron spectrum at various time delays, we can gain information about the energy transfer mechanisms.

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