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Femtosecond Time-Resolved Energy Transfer Dynamics in Excited Doped Helium Nanodroplets CATHERINE SALADRIGAS, STEPHEN R. LEONE, DANIEL M. NEUMARK, University of California, Berkeley, OLIVER GESSNER, Lawrence Berkeley National Lab — Helium nanodroplets are often utilized as a spectroscopic matrix because they are optically transparent and weakly interact with atomic and molecular dopants. In contrast, when exposed to XUV radiation, the droplet is electronically excited and subsequently undergoes a variety of relaxation mechanisms. We are interested in studying energy and charge transfer between the excited droplet environment and embedded dopants, as well as the competition with internal droplet relaxation mechanisms. Previously, energy transfer to a noble gas dopant in an electronically excited droplet was observed in a steady-state experiment. Indirect ionization of the dopant is particularly pronounced for energies at which the droplet exhibits strong absorption. In a complimentary femtosecond time-resolved experiment, we want to probe the underlying energy transfer mechanisms in the time domain. Using a high harmonic generated femtosecond XUV pulse to electronically excite the droplet and a UV probe pulse to modulate the photoelectron signal produced from the energy transfer, we monitor the energy-transfer yield as a function of pump-probe time delay.

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