

Abstract Submitted  
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**Two-color x-ray pump x-ray probe study of the core-hole decay dynamics in XeF<sub>2</sub>** ANTONIO PICON, C. STEFAN LEHMANN, STEPHEN SOUTHWORTH, PHAY HO, GILLES DOUMY, ELLIOT KANTER, BERTOLD KRAESSIG, ANNE MARIE MARCH, DOOSHAYE MOONSHIRAM, LINDA YOUNG, STEVE PRATT, Argonne National Laboratory, DIPANWITA RAY, Lawrence Berkeley National Laboratory, CHRISTOPH BOSTEDT, JACEK KRZYWINSKI, KEN FERGUSON, SEBASTIAN CARRON, MAX BUCHER, SLAC National Accelerator Laboratory, DANIEL ROLLES, BENJAMIN ERK, CEDRIC BOMME, CFEL, DESY, ARTEM RUDENKO, Kansas State University, TIMUR OSIPOV, NORA BERRAH, Department of Physics, UCONN, LAN CHENG, JOHN STANTON, University of Texas — To resolve the femtosecond inner-shell dynamics and the subsequent induced electron transfer in a molecule, the core-hole decay dynamics in XeF<sub>2</sub> have been directly studied using femtosecond time-resolved x-ray pump x-ray probe coincidence imaging. The study of XeF<sub>2</sub> molecule allows us to compare the molecular core-hole decay with the atomic case, Xe atom. To study these processes, the recently developed capability at LCLS was used to generate two-color x-ray pulses with variable delay. A time and position sensitive detector has been used to record the ion fragments in coincidence. The correlated ion kinetic energies make it possible to select and assign different excitation pathways, being able to track the atomic and the molecular core-hole decay dynamics.

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