Abstract Submitted
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**Two-color x-ray pump x-ray probe study of the core-hole decay dynamics in $XeF_2$**[1] CARL STEFAN LEHMANN, ANTONIO PICON, STEVE SOUTHWORTH, GILLES DOUMY, ANNE MARIE MARCH, ELLIOT KANTER, BERTOLD KRAESSIG, DOOSHAYE MOONSHIRAM, LINDA YOUNG, X-ray Science Division, Argonne National Laboratory, STEVE PRATT, Chemical Sciences & Engineering Division, Argonne National Laboratory, CHRISTOPH BOSTEDT, JACEK KRYZWINSKI, KEN FERGUSON, MAX BUCHER, TAIS GORKHOVER, TIMUR OSIPOV, LCLS, SLAC National Accelerator Laboratory, DANIEL ROLLES, BENJAMIN ERK, CEDRIC BOMME, Max-Planck-Advanced Study Group at CFEL, DESY, ARTEM RUDENKO, Department of Physics, Kansas State University, DIPANWITA RAY, Chemical Science Division, Lawrence Berkeley National Laboratory, NORA BERRAH, Department of Physics, UCONN, AGOSTINO MARINELLI, LCLS, SLAC National Accelerator Laboratory — To resolve the femtosecond inner-shell dynamics and the subsequent induced electron transfer in a molecule, the core-hole decay dynamics in $XeF_2$ have been directly studied using femtosecond time-resolved x-ray pump x-ray probe ion-ion coincidence imaging. Inner-shell photoionization of Xe triggers core-hole decay that is initially localized but subsequently involves delocalized valence electrons. Charge is distributed to neighboring atoms and the system Coulomb explodes. The processes proceed concurrently on the femtosecond time scale. $XeF_2$ is a very interesting molecule, as it allows us to compare the molecular core-hole decay with the atomic case, Xe atom.

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