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Stimulated predissociation of CO^{2+} using intense ultrashort laser pulses[1] J. MCKENNA, A.M. SAYLER, B. GAIRE, NORA G. JOHNSON, K.D. CARNES, B.D. ESRY, I. BEN-ITZHAK, J.R. Macdonald Laboratory, Department of Physics, Kansas State University — The carbon monoxide dication is an unusual species that is metastably bound despite strong electrostatic repulsion of its charged centers. Normally, the majority of the CO^{2+} bound vibrational states decay by predissociation, with a lifetime on the order of nanoseconds to microseconds, due to strong coupling with a repulsive state. By forming the CO^{2+} ions as a molecular ion beam, we explore the possibility of manipulating this coupling using an intense ($\sim 10^{14}$ W/cm^2), ultrashort (<40 fs), 790 nm laser pulse. Only the v=0 level of the ground electronic state survives the trip from source to laser interaction point, thereby, enabling a kinematically complete study of vibrationally cold CO^{2+} using a coincidence 3D momentum imaging technique.

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