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Dissociation dynamics of the CO_2 molecule studied with XUV pump and near-infrared probe experiments[1] KANAKA RAJU PANDIRI, YU MALAKAR, XIANG LI, BALRAM KADERIYA, WRIGHT PEARSON, WEI CAO, ITZIK BEN-ITZHAK, DANIEL ROLLES, ARTEM RUDENKO, J.R. Macdonald Laboratory, Department of Physics, Kansas State Univerisity, KS, PHILIP TRAPP, DANIEL TRABERT, FLORIAN WILHELM, Institut fur Kernphysik, Johann Wolfgang Goethe-Universitat, Frankfurt, Germany — Ultrafast dynamics of ionic states of the CO_2 molecule have recently been studied by employing a pump-probe technique using broadband ultrashort XUV-pump pulses containing the 11^{th} to 17^{th} harmonics of a near-infrared laser (NIR) [1]. Here, we present the results of a complimentary experiment employing longer (˜100 fs) but narrowband, single harmonic (11^{th} or 13^{th}) pulses to excite molecular wave packets to specific states of CO_2^+, which are probed by NIR-induced dissociation. We employ a reaction microscope to measure energy- and angle-resolved yields of all charged reaction fragments as a function of XUV-NIR delay. In particular, the delay dependence of O^+ and CO^+ ion production for parallel and perpendicular NIR and XUV polarizations are contrasted with the data obtained by Timmers *et al.* [1] using ultrashort broadband train of harmonics. [1] H. Timmers *et al.*, Phys. Rev. Lett. **113**, 113003 (2004).

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