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Electronic relaxation of pyrazine probed at the carbon K-edge[1]
VALERIU SCUTELNIC, MICHAEL EPSHTEIN, STEPHEN LEONE, University of California, Berkeley — X-rays promote electrons from the core levels to vacant valence orbitals, thus endowing them with a unique element specificity. Moreover, the core level transitions can easily sense the shifts in the electron density in the proximity of the probed element. We produce soft X-rays around 280 eV driving high harmonics in a helium gas target with 1470 nm pulses. This table-top broad band X-ray source allows us to investigate the ultrafast dynamics in photoexcited pyrazine (C4H4N2). Pyrazine is excited to the second singlet excited state with 266 nm light, which is previously thought to convert in tens of femtoseconds to the first excited singlet state and then to the ground state in tens of picoseconds [1]. Recent experimental results with X-ray transient absorption indicate another major timescale of 1 ps, which can be assigned to a vibrationally excited electronic ground state or isomers of pyrazine (pyrimidine and pyridazine). An ongoing collaboration with theoreticians is aimed to disambiguate the nature of the observed transients.
1. V. Stert et al., J. Chem. Phys., 112, 4460 (2000).

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