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Probing NO₂ close to the $\tilde{A}^2B_2/\tilde{X}^2A_1$ conical intersection by time-resolved imaging spectroscopy BENJAMIN WHITAKER, NICK FORM, University of Leeds, UK, VALERIE BLANCHET, Universite Paul Sabatier, Toulouse, BEATRICE CHATEL, BERTRAND GIRARD, Universite Paul Sabatier, SCHOOL OF CHEMISTRY, UNIVERSITY OF LEEDS COLLABORATION, LCAR, IR-SAMC, UNIVERSITE PAUL SABATIER COLLABORATION — Time-resolved imaging spectroscopy (TRIS) is emerging as a versatile technique with which to study the non-adiabatic coupling of vibrational and electronic degrees of freedom in molecules. The electronic predissociation of NO₂ in the near UV proceeds by internal conversion between the \tilde{A}^2B_2 and \tilde{X}^2A_1 states and is a benchmark example of such barrierless reactions. We have applied time-resolved imaging to measure the time-evolution, angular and kinetic energy distributions of NO⁺, NO₂⁺ and photo electrons produced in pump-probe experiments using harmonics from a regeneratively amplified self-mode locked Ti:sapphire laser. Oscillations in the slow NO⁺ and photoelectron signals are observed and are interpreted as measuring the energy level density of the coupled \tilde{A}^2B_2 and \tilde{X}^2A_1 states close to the conical intersection. By using an optical pulse shaper we are able to manipulate the spectrum of the ~400 nm excitation to create pulse sequences with which we can exert partial control over the coupling between the \tilde{A}^2B_2 and \tilde{X}^2A_1 states.

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