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Molecular Wavepacket Dynamics at a Jahn-Teller Conical Intersection VARUN MAKHIJA, KEVIN VEYRINAS, ANDREY E. BOGUSLAVSKIY, University of Ottawa, RUARIDH FORBES, University College London, University of Ottawa, IAIN WILKINSON, Helmholtz-Zentrum Berlin, National Research Council, Ottawa, Canada, DOUG MOFFATT, SIMON NEVILLE, MICHAEL SCHUURMAN, RUNE LAUSTEN, National Research Council, Ottawa, Canada, ALBERT STOLOW, University of Ottawa, National Research Council, Ottawa, Canada — According to the Jahn-Teller theorem, any symmetric configuration of atoms in an electronically degenerate molecular state is unstable and distorts to a configuration of lower symmetry, hence lifting the degeneracy. Jahn-Teller dynamics feature in numerous, highly symmetric systems, such as fullerenes and in doped rare-earth magnetites where they underly the phenomenon of colossal magnetoresistance. Here, we use ultrafast time-resolved photoelectron velocity-map imaging (VMI) to study the fundamental Jahn-Teller dynamics in an excited state of isolated ammonia (NH_3) molecules. Supersonically cooled NH_3 is resonantly excited by a 160 nm, 80 fs pump pulse. A time delayed 400 nm, 40 fs probe pulse photoionizes the molecule and the kinetic energy and angular distribution of the ejected photoelectron is measured as a function of time. Dramatic changes in the time-dependent angular distributions are observed, which reveal details of non-adiabatic wavepacket propagation on the coupled Jahn-Teller potential surfaces.

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