

Abstract Submitted
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Theoretical interpretation of attosecond transient absorption experiments on diatomics in O_2 ¹ XUAN LI, DANIEL J. HAXTON, C. WILLIAM MCCURDY, Lawrence Berkeley National Laboratory — We study the features in the XUV attosecond transient absorption spectrum that have been recently observed by Arvinder et al. (Phys. Rev. Lett. 109, 173001 (2012)) by using the fixed nuclei approximation and a recently developed implementation of the multiconfiguration time-dependent Hartree Fock (MCTDHF) method. We find that there is a one-to-one correspondence between the magnitude of the Fano q parameter of the resonances corresponding to the autoionizing Rydberg series and the sign of the change in their photo absorption intensity in the transient absorption experiment that depends on the time delay of a near-infrared (NIR) pulse. The calculated transient absorption spectrum and these features of the experiment can be explained using a few-level model in combination of a sudden approximation where the XUV-induced polarization is instantly extinguished by the intense NIR field.

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