

Abstract Submitted
for the DAMOP10 Meeting of
The American Physical Society

Signatures of symmetry and electronic structure in high harmonic generation in polyatomic molecules MICHAEL WONG, JEAN-PAUL BRICHTA, RAVI BHARDWAJ, University of Ottawa — We report detailed measurements of high harmonic generation in chloromethane molecules (CCl_4 , CHCl_3 , and CH_2Cl_2) to show that fingerprints of symmetry and electronic structure can be decoded from high harmonic generation even in complex randomly oriented molecules. In our measurements, orbital symmetries of these molecules are reflected as both extended harmonic cut-offs and a local minimum in the ellipticity dependence of the cut-off harmonics, suggesting occurrence of quantum interferences during ionization. The harmonic spectra exhibit two distinct interference minima at ~ 42 eV and ~ 60 eV. We attribute the former to the Cooper minimum in the photoionization cross-section and the latter to the intra-molecular interference during the recombination process.

Michael Wong
University of Ottawa

Date submitted: 19 Mar 2010

Electronic form version 1.4