Abstract Submitted
for the DAMOP14 Meeting of
The American Physical Society

Achieving a quantitative understanding of carrier-envelope phase effects in the benchmark H_2^+ molecule[1] SHUO ZENG, NORA KLING, KELSIE BETSCH, MOHAMMAD ZOHRABI, FATIMA ANIS, UTUQ ABLIKIM, BETHANY JOCHIM, ZHENHUA WANG, J. R. Macdonald Laboratory, Department of Physics, Kansas State University, MATTHIAS KUEBEL, MATTHIAS KLING, Max-Planck-Institut fur Quantenoptik, Garching, Germany, KEVIN CARNES, BRETT ESRY, ITZIK BEN-ITZHAK, J. R. Macdonald Laboratory, Department of Physics, Kansas State University — The implementation of carrier-envelope phase (CEP) control over H_2^+ provides an ideal opportunity for a detailed, benchmark comparison of theory and experiment. Given complete experimental inputs, theory should, in principle, be able to reproduce the measured observables quantitatively. Nevertheless, the agreement in Ref. [1] was less than satisfactory. To try to explain the discrepancies, we theoretically consider (i) a non-Gaussian laser spectrum and (ii) the contribution of $n \geq 2$ manifolds and ionization. These two effects will be shown to produce non-trivial changes in the observables.

[1] N. G. Kling *et al*, Phys. Rev. Lett. **111**, 163004 (2013).

[1]This work was supported by the Chemical Sciences, Geosciences, and Biosciences Division, Office of Basic Energy Sciences, Office of Science, U.S. Department of Energy under Grant No. DE-FG02-86ER13491. The PULSAR laser was provided by Grant No. DE-FG02-09

Shuo Zeng
J. R. Macdonald Laboratory, Department of Physics, Kansas State University

Date submitted: 04 Feb 2014 Electronic form version 1.4