Abstract Submitted
for the DAMOP14 Meeting of
The American Physical Society

Percent-level accuracy in measuring photoionisation yields and peak intensities for intense few-cycle laser pulses[1] DAVID KIELPINSKI, W.C. WALLACE, O. GHAFUR, J.E. CALVERT, C. KHURMI, D.E. LABAN, I.V. LITVINYUK, R.T. SANG, ARC Centre of Excellence for Coherent X-Ray Science and Australian Attosecond Science Facility, Griffith University, Brisbane, Australia, K. BARTSCHAT, Department of Physics and Astronomy, Drake University, Des Moines, IA, USA, A.N. GRUM-GRZHIMAILO, Institute of Nuclear Physics, Moscow State University, Moscow, Russia, D. WELLS, H.M. QUINEY, ARC Centre of Excellence for Coherent X-Ray Science, University of Melbourne, Melbourne, Australia, X.M. TONG, Division of Materials Science, University of Tsukuba, Tsukuba, Japan — The correct interpretation of experimental results in strong-field physics depends critically on both the measurement precision and on accurate knowledge of the laser peak intensity. We have accurately measured the photoionization yields of atomic hydrogen (H) and molecular hydrogen (H_2) in intense, few-cycle laser pulses, and compared them against various theoretical models. From our comparison with highly precise numerical solutions of the three-dimensional (3D) time-dependent Schrödinger equation (TDSE), we have derived an intensity calibration standard accurate to better than 3%. This standard is easily usable in any strong-field physics experiment capable of measuring photoionization yields.

[1]Supported by AFOSR and the Australian Research Council.

David Kielpinski
ARC Centre of Excellence for Coherent X-Ray Science and
Australian Attosecond Science Facility, Griffith University,
Brisbane, Australia

Date submitted: 11 Feb 2014 Electronic form version 1.4