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Precise photoionization yields of atomic hydrogen using intense few-cycle light pulses R.T. SANG, O. GHARFUR, W.C. WALLACE, J.E. CALVERT, D.E. LABAN, M.G. PULLEN, ARC Centre of Excellence for Coherent X-Ray Science, Griffith University, Nathan, QLD, 4111 Australia, A.N. GRUM-GRZHIMAILO, Institute of Nuclear Physics, Moscow State University, Moscow, Russia, K. BARTSCHAT, Department of Physics and Astronomy, Drake University, Des Moines, Iowa,USA, I.V. LITVINYUK, D. KIELPINSKI, ARC Centre of Excellence for Coherent X-Ray Science, Griffith University, Nathan, QLD, 4111 Australia — The interaction of intense few-cycle infrared laser pulses with matter is the fundamental process at the heart of strong-field science. The complex, highly nonlinear dynamics that occur in the regime of few-cycle laser pulses necessitate accurate theoretical simulations in order to retrieve useful physical measurements and provide a sensible physical interpretation of the experimental data. Strong-field ionization experiments involving atomic hydrogen (H) have been previously performed with a qualitative agreement to theory. Building on our earlier work, which obtained quantitative agreement at the 10% level between simulations and measurements of photoelectron spectra in H [M. G. Pullen *et al* 2011 *Opt. Lett.* **36** 3660], we now extend this scheme to measurements of the total photoionization yield. We interact a few-cycle laser pulse with duration of 6 fs, 800 nm central with an H beam created though an RF discharge source. The ions that are created as a result of photoionization events are detected by a time-of-flight mass spectra and an ionization yield is determined.

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