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Carrier-envelope phase effects in few-cycle ionisation of atomic hydrogen DAVID KIELPINSKI, W.C. WALLACE, M.G. PULLEN, O. GHAFUR, D.E. LABAN, A.J. PALMER, Australian Attosecond Science Facility and Centre for Coherent X-Ray Science, Griffith University, G.F. HANNE, Westfälische Wilhelms-Universität, Münster, A.N. GRUM-GRZHIMAILO, Drake University and Moscow State University, K. BARTSCHAT, Drake University, I.A. IVANOV, A.S. KHEIFETS, Australian National University, X.-M. TONG, Tsukuba University, H.M. QUINEY, Centre for Coherent X-Ray Science, University of Melbourne, I.V. LITVINYUK, R.T. SANG, Australian Attosecond Science Facility and Centre for Coherent X-Ray Science, Griffith University — The control of strong-field photoionization with laser carrier-envelope phase (CEP) is the key enabling technique for attosecond science. Currently, quantitatively accurate *ab initio* simulations of this process can only be carried out for atomic hydrogen. We have observed CEP effects in the above-threshold ionisation of atomic hydrogen for the first time. The modulation due to CEP is mapped over a wide range of laser intensity and electron energy. The data is compared with *ab initio* simulations for the time dependent Schrödinger equation carried out using three separate methodologies, as well as a semi-*ab initio* simulation method. We find reasonable agreement between experiment and all simulations over the entire sampled parameter space. Our results point the way toward accurate calibration of absolute laser CEP by means of the uniquely calculable hydrogen system.

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