

Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

A high-repetition rate LWFA for studies of laser propagation and electron generation ZHAOHAN HE, Center for Ultrafast Optical Science, University of Michigan, Ann Arbor, Michigan 48109-2099, JAMES EASTER, BIXUE HOU, KARL KRUSHELNICK, JOHN NEES, ALEC THOMAS, Center for Ultrafast Optical Science, University of Michigan, Ann Arbor, Michigan 48109-2099 — Advances in ultrafast optics today have enabled laser systems to deliver ever shorter and more intense pulses. When focused, such laser pulses can easily exceed relativistic intensities where the wakefield created by the strong laser electric field can be used to accelerate electrons. Laser wakefield acceleration of electrons holds promise for future compact electron accelerators or drivers of other radiation sources in many scientific, medical and engineering applications. We present experimental studies of laser wakefield acceleration using the λ -cubed laser at the University of Michigan – a table-top high-power laser system operating at 500 Hz repetition rate. The high repetition rate allows statistical studies of laser propagation and electron acceleration which are not accessible with typical sub-0.1 Hz repetition rate systems. In addition, we compare the experiments with particle-in-cell simulations using the code OSIRIS.

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Date submitted: 19 Jul 2010

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