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High repetition rate relativistic electron beam generation from intense laser solid interactions THOMAS BATSON, JOHN NEES, BIXUE HOU, ALEXANDER THOMAS, University of Michigan, KARL KRUSHELNICK, Univeristy of Michigan — Relativistic electron beams have wide-ranging applications in medicine, materials science, and homeland security. Recent advances in short pulse laser technology have enabled the production of very high focused intensities at kHz rep rates. Consequently this has led to the generation of high flux sources of relativistic electrons - which is a necessary characteristic of these laser plasma sources for any potential application. In our experiments, through the generation of a plasma by focusing a 5 x 10^{18} W/cm^2, 500 Hz, Ti:Sapphire laser pulse onto a fused silica target, we have measured electrons ejected from the target surface having energies in excess of an MeV. The spectrum of these electrons, as well as the spatial divergence of the resulting beam, was also measured with respect to incident laser angle, prepulse timing and focusing conditions. The experimental results are compared to particle in cell simulations.

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