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Laser Conditioning of Wakefield Electron Beams SCOTT SEPKE, SUDEEP BANERJEE, University of Nebraska, RAHUL SHAH, ANTHONY VALENZUELA, DONALD UMSTADTER, University of Nebraska — Recent experiments at the University of Michigan have demonstrated the selective removal of 200 keV electrons by colliding a Maxwellian laser wakefield electron beam with a high intensity ($I \sim 10^{18}$ W/cm^2) laser pulse. This technique shows great promise in a number of areas of active research as a tool for creating ultrafast electron bunches with tunable energy and low transverse and longitudinal emittance. Using both analytical and numerical models, the mechanism and scale lengths of this process are illustrated and the importance of longitudinal laser fields are shown. Finally, this method is extended to higher energy particles and shorter pulse lengths. This work supported by Sandia National Labs

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