

Abstract Submitted
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Temporal compression of sub-1000 eV picosecond electron pulses with light fields for use in ultrafast electron microscopy¹ LYDIA WILEY DEAL, MOHAMMAD NAFISI BAHABADI, GARRET RADKE, BRETT BARWICK, Ripon College — We discuss progress on using all-optical techniques to compress low energy free electron pulses from picosecond durations to tens of femtoseconds or shorter. Our numerical simulations show that electron pulses that have dispersed from femtosecond pulse durations to picosecond durations after propagation can be recompressed into individual and series of femtosecond duration pulses. The use of low energy electrons allows simpler optical setups and single laser wavelengths greatly decreasing experimental complexity. These results are guiding current experiments in the lab that if successful will improve the temporal resolution of low energy ultrafast electron microscopes by more than an order of magnitude, allowing the exploration of dynamic systems that have motions too fast for current technologies to be explored.

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Brett Barwick
Ripon College

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