Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Few-cycle Relativistic Laser-Plasma Interactions at Kilohertz Repetition Rates[1] MATTHEW STANFIELD, HUNTER ALLISON, NICHOLAS BEIER, YASMEEN MUSTHAFA, SAHEL HAKIMI, AMINA HUSSEIN, FRANKLIN DOLLAR, STROBE, NSF Science Technology Center, University of California, Irvine — Relativistic few cycle laser pulses enable applications in high field physics, such as high harmonic generation or laser wakefield acceleration. We demonstrate efficient pulse compression of an output of a 36 fs laser pulse at 800 nm to 7 fs at the kilohertz repetition rate. Characterization of the on-target intensity shows that the overall wavefront is preserved, such that intensity is increased by >4. With proper dispersion correction optics, intensities of 10^{19} to 10^{20} Wcm^{-2} can be achieved. Numerical modeling is also presented for the pulse compression and the corresponding few cycle relativistic interaction. This work is supported by NSF under Grant No. DGE-1633631, DMR-1548924, PHY-1753165, and CHE-0840513.

[1]This work is supported by NSF under Grant No. DGE-1633631, DMR-1548924, PHY-1753165, and CHE-0840513.

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Date submitted: 29 Jun 2020 Electronic form version 1.4