

Abstract Submitted
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Thin film compression of a high rep rate laser: towards single-cycle pulse generation¹ DEANO FARINELLA, Univ of California - Irvine, SERGEY MIRONOV, Institute of Applied Physics - RAS, TAM NGUYEN, MATTHEW STANFIELD, FRANKLIN DOLLAR, TOSHIKI TAJIMA, Univ of California - Irvine — Thin Film Compression (TFC) has been proposed [1] as a means of increasing the peak power of ultrashort laser pulses with millijoule and greater energies. As opposed to increasing peak power by increasing the energy of the pulse, TFC instead achieves an amplification in peak power by compressing laser pulse length at a fixed energy. This pulse compression is accomplished by the generation of linearly chirped bandwidth through self-phase modulation, which is then recompressed by dispersive optics. A summary of the results of laser pulse compression experiments towards the production of single-cycle pulses will be presented. Simulations show [1] that laser pulses compressed to the single-cycle regime have the potential to generate single-cycle x-ray pulses which could be used to generate wakefields in solid-density plasma with acceleration gradients of up to TeV/cm [2].
[1] G. Mourou et al., Eur. Phys. J. 223, 1181 (2014)
[2] T. Tajima, Eur. Phys. J. 223, 1037 (2014); X.M. Zhang et al., Phys. Rev. Accel Beams. 19, 101004 (2016)

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