

Abstract Submitted  
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**Theoretical limit for attosecond Raman compression of powerful x-ray pulses in plasmas**<sup>1</sup> VLADIMIR MALKIN, NATHANIEL FISCH, Princeton University, JONATHAN WURTELE, University of California, Berkeley — We examined the possibility to improve both the longitudinal compression and focusing of intense x-ray pulses by means of resonant backward Raman amplification (BRA) of laser pulses in plasmas. The method features conventional Raman compression and beam-cleaning techniques in which the output can be made much shorter and better focusable than the pump. However, the plasma-based BRA deals with laser intensities that would be too high to handle efficiently otherwise. Similar method was applied earlier to optical laser pulses. We found the theoretical limit of about 1 nm for the shortest laser wavelength at which this method can be applicable to x-ray pulses. The respective shortest possible duration of output x-ray pulses is about 10 attoseconds.

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