

# LONGITUDINAL SHAPING OF ELECTRON BUNCHES WITH APPLICATIONS TO THE PLASMA WAKEFIELD ACCELERATOR

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## *Abstract*

The first successful attempt to generate ultrashort (1-10 picosecond) relativistic electron bunches characterized by a ramped current profile that rises linearly from head to tail and then falls sharply to zero was recently reported.\* Bunches with this type of longitudinal shape may be applied to plasma-based accelerator schemes as an optimized drive beam, and to free electron lasers as a means of reducing asymmetry in microbunching due to slippage. We will review the technique used to generate these bunches, which utilizes a sextupole-corrected dogleg compressor to manipulate the longitudinal phase space of the beam, and examine its potential application in a realistic plasma wakefield accelerator scenario, the proposed FACET project at SLAC.

\* R.J. England, J.B. Rosenzweig, G. Travish, Phys. Rev. Lett. 100, 214802 (2008).

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