Multi GeV Electron Bunches from an All-Optical Laser Wakefield Accelerator

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We discuss two recent methods for optically generating plasma waveguides to enable meter-scale LWFAs and the first successful implementation of the technique to accelerate electron bunches up to 5 GeV in a 20 cm all-optical LWFA [1]. We present transverse plasma interferometry, guided mode images and electron spectra collected during experimental campaigns on the ALEPH laser at Colorado State University, as well as particle in cell simulations to supplement the physical picture of the acceleration process.

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References
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