Abstract Submitted
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Laser pincette for high-density attosecond electron bunch generation[1] S. KAWATA, S. MIYAZAKI, S. HASUMI, Utsunomiya University, Japan, Q. KONG, Fudan University, K, SAKAI, T. KIKUCHI, Utsunomiya University, Japan — An attosecond high-density electron bunch is produced by an intense short-pulse TEM10+TEM01-mode laser. The transverse ponderomotive force of the TEM10+TEM01-mode laser confines pre-accelerated electrons in the transverse direction, just like a laser pincette, and at the same time the laser longitudinal electric field accelerates the electrons [1]. Our three-dimensional particle simulations show that the pre-accelerated electrons are accelerated to a few hundreds MeV and are compressed to ∼499 attoseconds with a low energy spread (∼3.5 %). The electron density of the attosecond bunch reaches ∼43 times as high as the initial number density. Such the attosecond electron beam is now available to attophysics. [1] Q. Kong, S. Miyazaki, S. Kawata, et al., Phys. Rev. E, 69, 056502(2004)

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