2D Particle-in-cell Simulation of Terahertz Generation using fs Laser from Gas with initial density modulation

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Purpose

To demonstrate the effect of initial density modulation on the generation of the terahertz radiation during ionization of gas targets by ultrafast intense laser pulses.

Activities and results

Initial gas density modulation is applied in the transverse and longitudinal direction of the laser field and the results are compared to those without any such initial modulations.

The results may suggest a possible method to control the characteristics of THz wave generated during the ionization of the gas by intense fs laser.

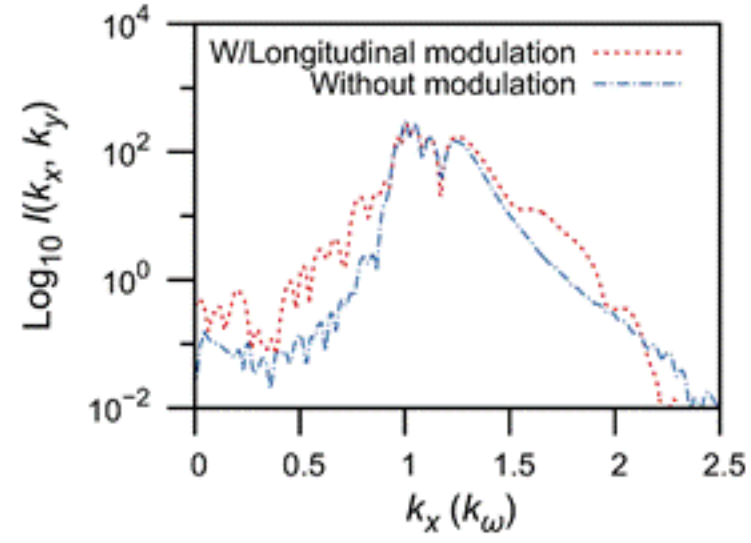

Fig 1. Spectrum of THz emission along laser propagation axis with and without longitudinal initial gas density modulation of 50 μm.

Misc.

Sim. box: $2400/k_x$ x $5000/k_y$, Sim. time: $20000/\omega_{SH}$
CPU number: 16 (MPI2), CPU time: ~ 10 Hours, Memory: 10 GB