

# Quasi-monochromatic terahertz emission from rippled air irradiated by femtosecond laser pulses

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## *Purpose*

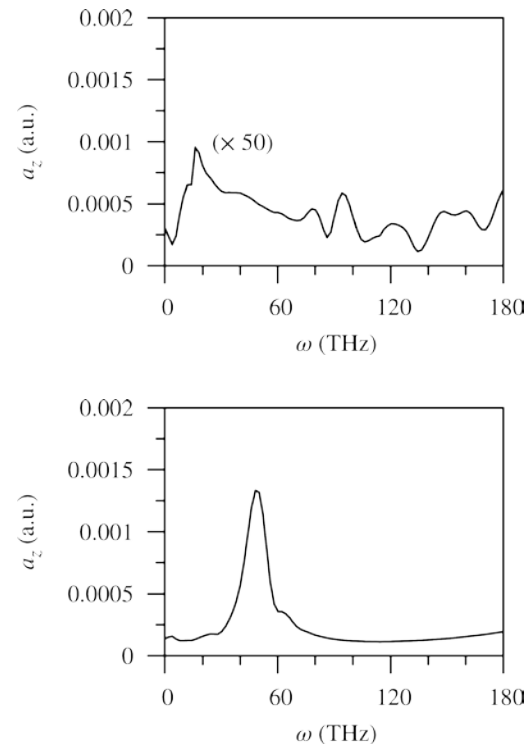
Demonstrate the feasibility of plasma waveguide for a intense narrowband THz source via laser-plasma interaction.

## *Activities and results*

Formation of plasma waveguide during the THz generation process via tunnel-ionization of transversely modulated gas target is studied with a fully kinetic two-dimensional particle-in-cell simulation. At a specific modulation configuration, bandwidth narrowing and intensity growing is observed in the resulting THz spectra.

## *Misc.*

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



Spectrum of THz wave obtained with (Up) a target with a uniform gas density, (Down) a target with a transverse sinusoidal modulation in a way that the density is minimum at the laser propagation axis, maximum near the laser waist. A single wavelength (800 nm) laser with a focused intensity of  $10^{16}$  W/cm<sup>2</sup> is used.