Monoenergetic collimated electron beams driven by crossed laser beams

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PIC simulations were carried out to investigate intense lasers interactions with solid projectile to produce high quality electron beams. Two crossed laser beams, linearly polarized with opposite phases from each other, irradiate the electrons with incidence angles 5^0 and -5^0.

The electrons are restricted in the negative half of E_z for a time of $98T_0$. As a result, the electron bunches with a total charge of nano-Coulomb can be accelerated to 760 MeV with an energy spread of 2.7% and a divergence angle of 12.2 mrad.

Core numbers: 64, CPU time: 2h
Simulation box: 2000×1000, Memory: 5G

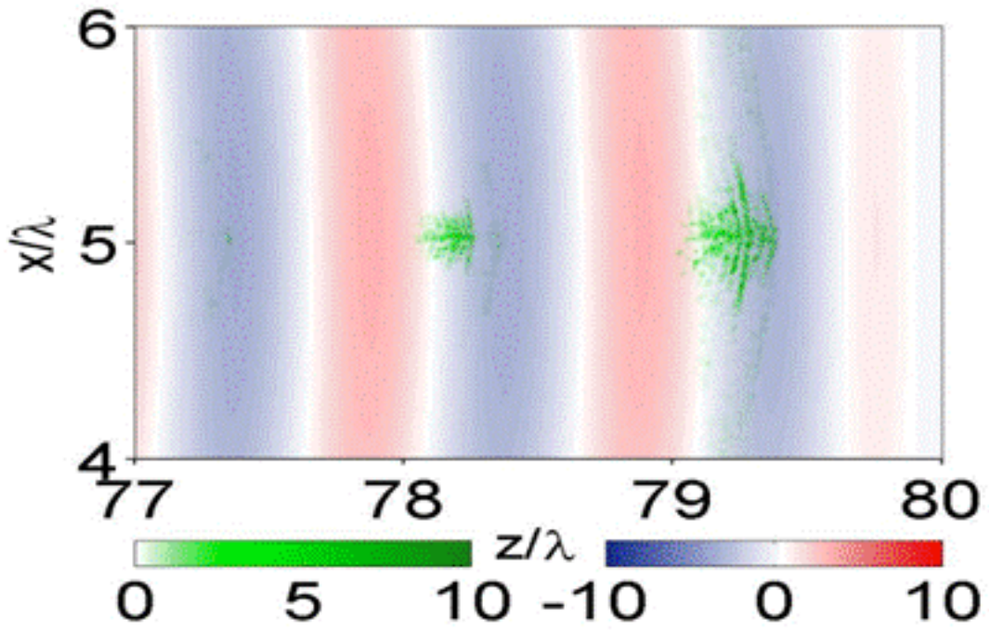

Fig. 1. Electron and field distributions

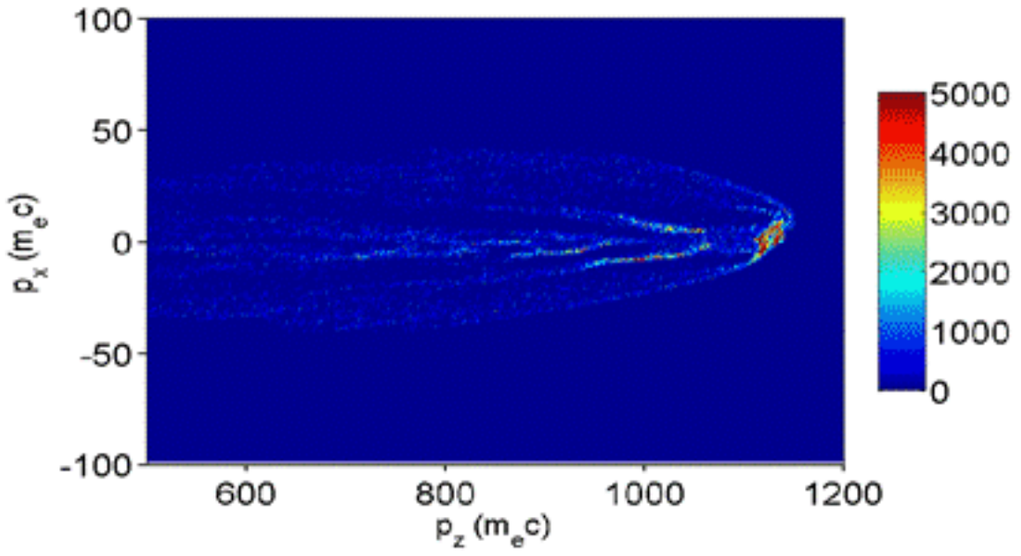

Fig. 2. Electron momentum distribution