# Photon emission enhancement studies from the interaction of ultra-intense laser pulse with shaped targets

S. Chintalwad[1], S. Krishnamurthy[1], B. Ramakrishna[1] and C. P. Ridgers[2]
[1] Department of Physics, Indian Institute of Technology Hyderabad, Kandi, Sangareddy.
[2]Department of Physics, University of York, Heslington, York.
e-mail (speaker): ph19resch02002@iith.ac.in

We study the photon emission by Bremsstrahlung and Non-linear Compton Scattering(NCS) from interaction of ultra-intense laser pulses with cone target and flat foil using particle-in-cell (PIC)simulations[1]. The simulations are performed for laser pulse interacting with Al and Au targets. The strength of the two mechanisms of photon emission from bremsstrahlung and nonlinear Compton scattering are compared[2-3]. When an ultra-intense ( $I > 10^{22}Wcm^{-2}$ ) laser interacts with a cone and a foil target,

photon emission by bremsstrahlung is found to be comparable to that from nonlinear Compton scattering.
The obtained electron energy as well as the energy and number of photons emitted were found to be higher in case of cone shaped target compared to that of a foil target.

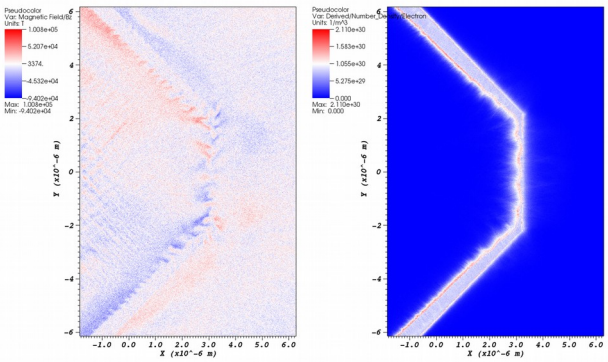

**Figure 1.** Magnetic field Bz (left), electron density (right) for cone shaped targets.

The enhanced photon emission from cone shaped target is attributed to the guiding or collimation of hot electrons towards the cone tip from the self-generated magnetic fields along the cone surface which pushes the hot electrons towards the tip.

References

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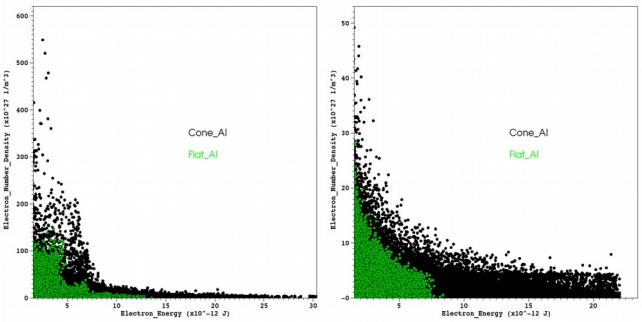


**Figure 2.** Electron number density corresponding to their energy.