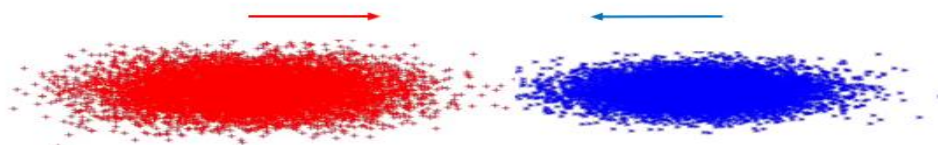


Beam-Beam Simulation Models and Numerical Noises for Flat-Beam Collisions in the Electron-Ion Collider

Abstract #12

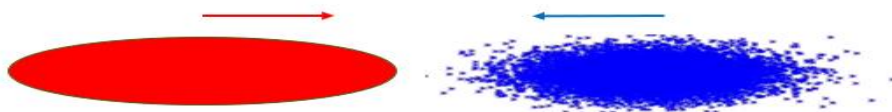
Yum Luo, BNL

- **Strong-strong simulation model**

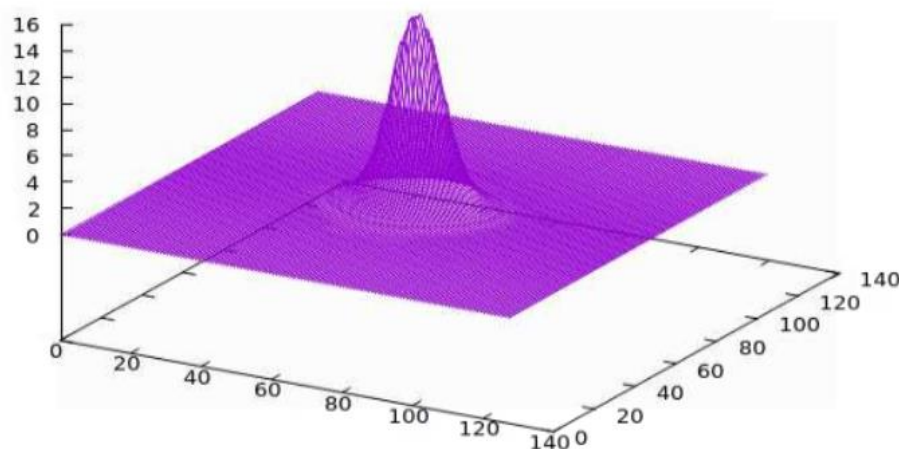


Both bunches are represented by $\sim$ a million macro-particles. Subject to numerical noises.

- **Weak-Strong simulation model**

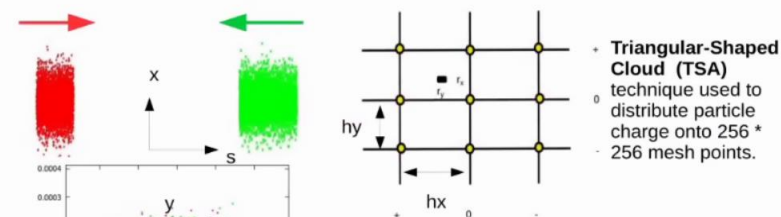


Strong bunch is rigid while weak bunch is represented by macro-particles. Not consistent.



Charge density variation on grids

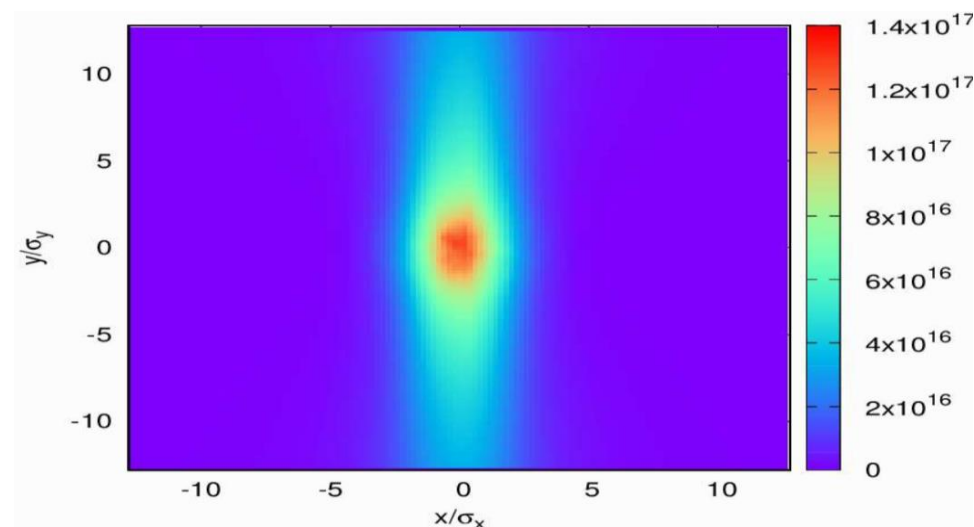
Particle-In-Cell (PIC) Poisson solver



Luminosity from these two slices

$$L = n_b f_0 N^+ N^- \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} \rho^+(x, y) \rho^-(x, y) dx dy$$

Translated in coding:



Space charge kick variation on grids