

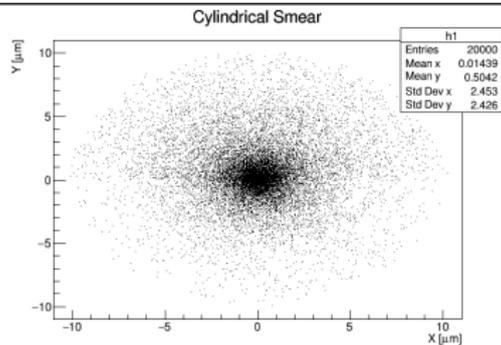
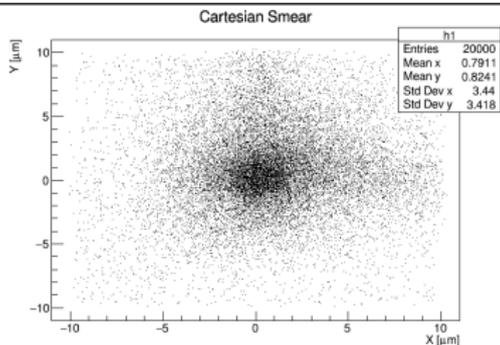
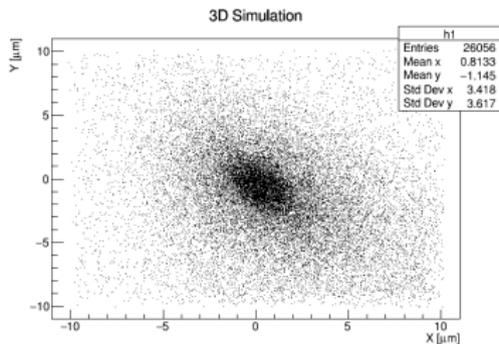
LhARA: Meeting

Hin Tung Lau

November 19, 2020

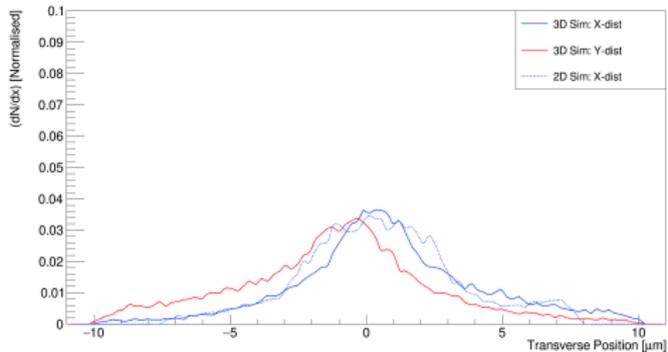
2D to 3D Smearing

Comparison of a 3D simulation compared to smearing methods when sampling x-plane:

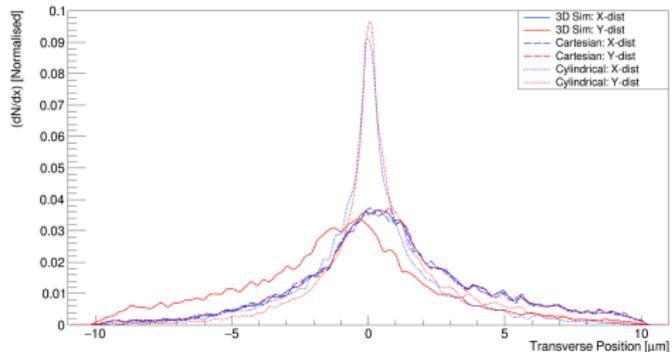


2D to 3D Smearing 1D Comparison

3D Sim vs 2D Sim: Transverse Position

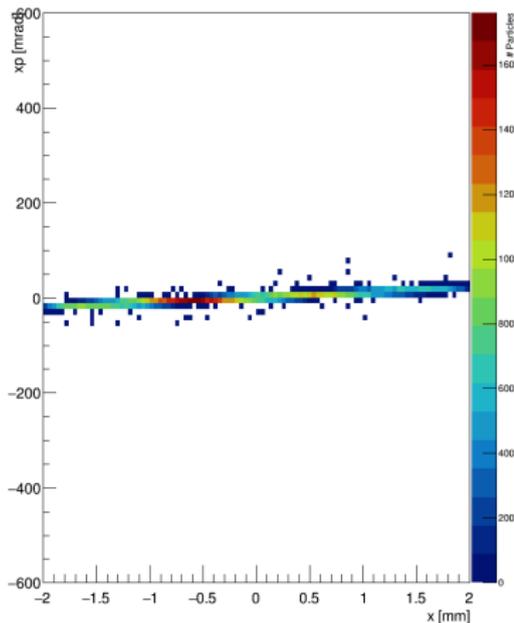


3D Sim vs Smear: Transverse Position

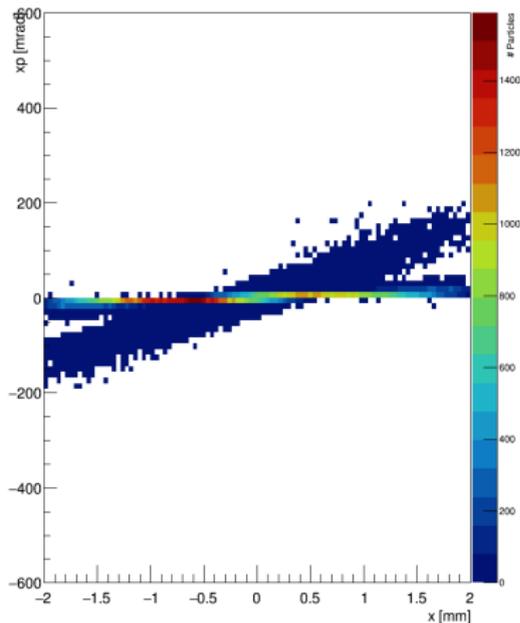


Space Charge with Cartesian Smear

Cartesian: x-xp out of nozzle: All KE (no SC)



Cartesian: x-xp out of nozzle: All KE (SC)

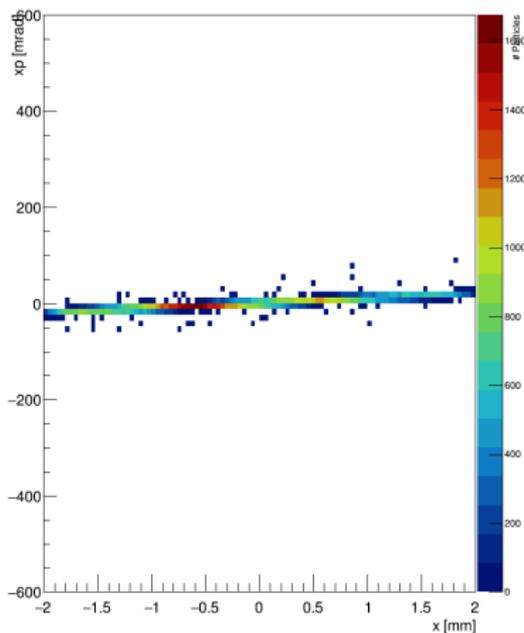


- Presence of space charge seems to split x-xp phase space into two parts one higher energy and one lower energy.

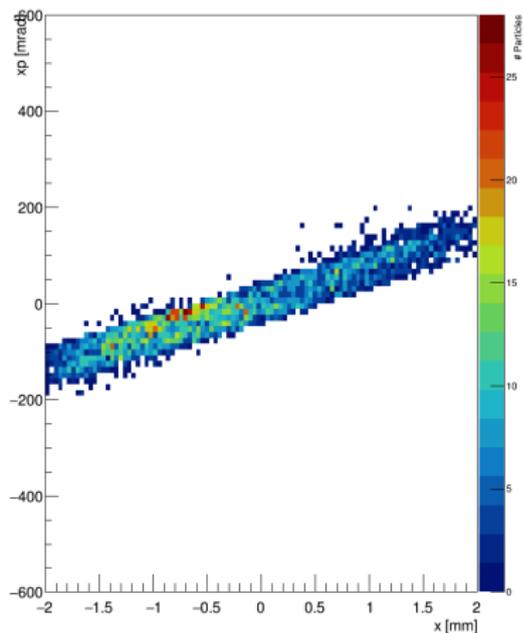
Space Charge with Cartesian Smear

Space charge x-xp phase space with KE cuts:

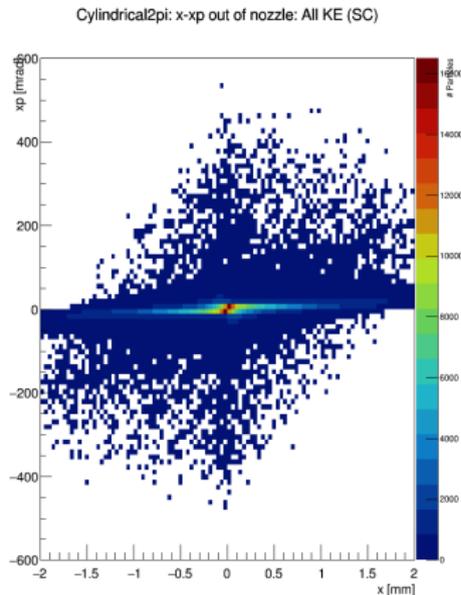
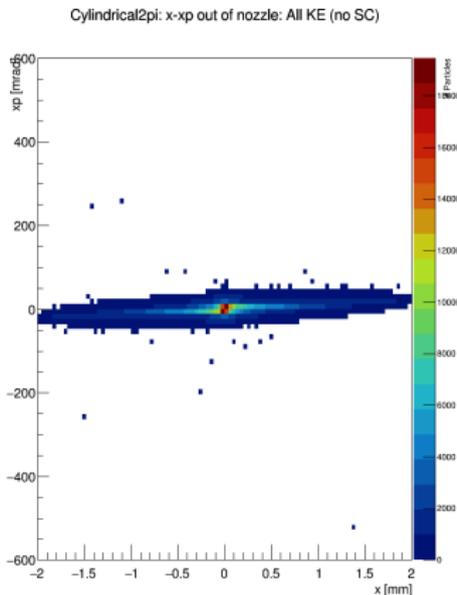
Cartesian: x-xp out of nozzle: KE < 5 MeV (SC)



Cartesian: x-xp out of nozzle: KE > 5 MeV (SC)



Space Charge with Cylindrical2pi Smear

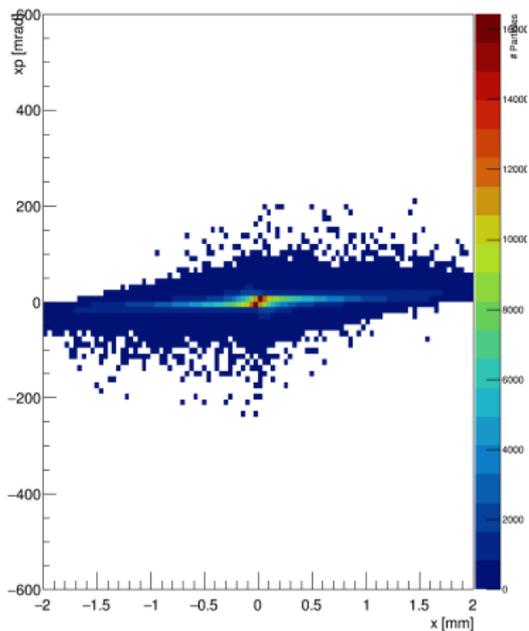


- Seems like the normalised momentum increases by about a factor of 10 for both smearing methods.
- But the cylindrical smearing method has about 2 times greater normalised momentum both with and without space charge.

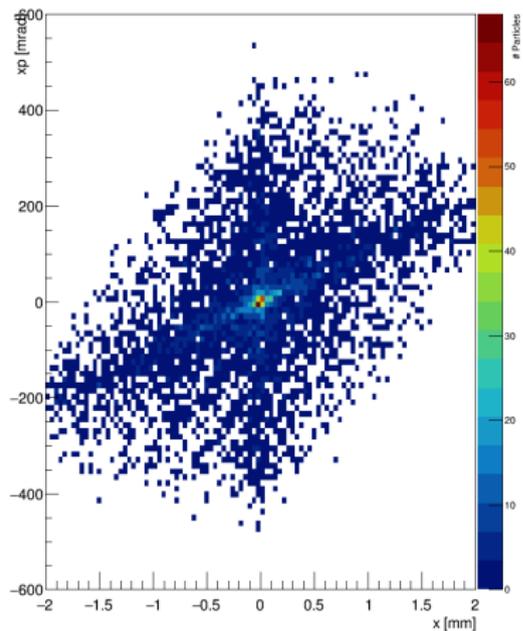
Space Charge with Cylindrical2pi Smear

Space charge x-xp phase space with KE cuts:

Cylindrical2pi: x-xp out of nozzle: KE<5 MeV (SC)

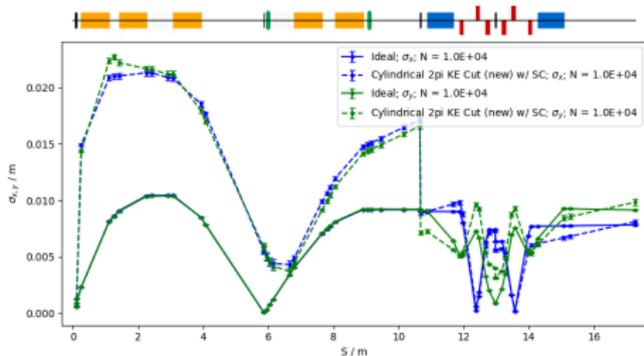


Cylindrical2pi: x-xp out of nozzle: KE>5 MeV (SC)



Evolution of SC Distributions

Cylindrical2pi



Cartesian

