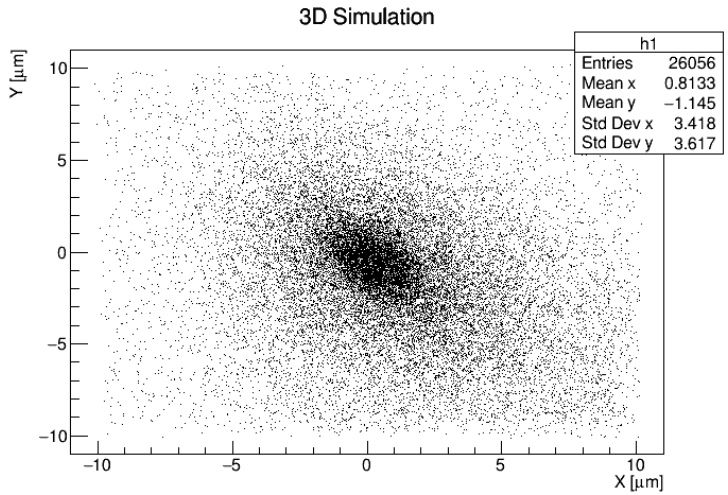
LhARA: Meeting

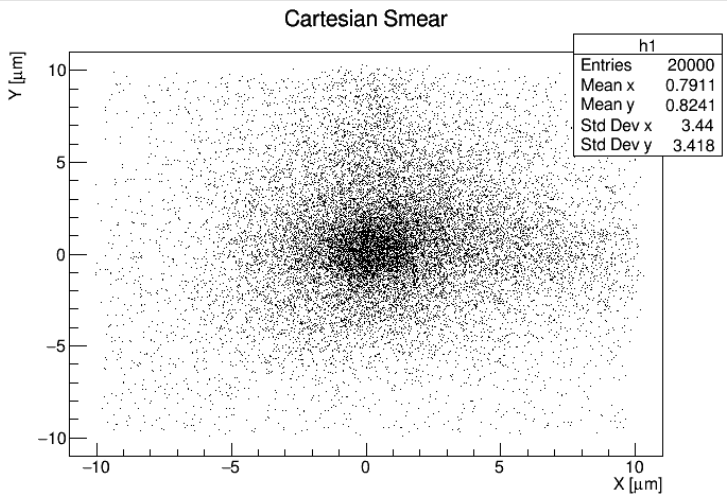
Hin Tung Lau

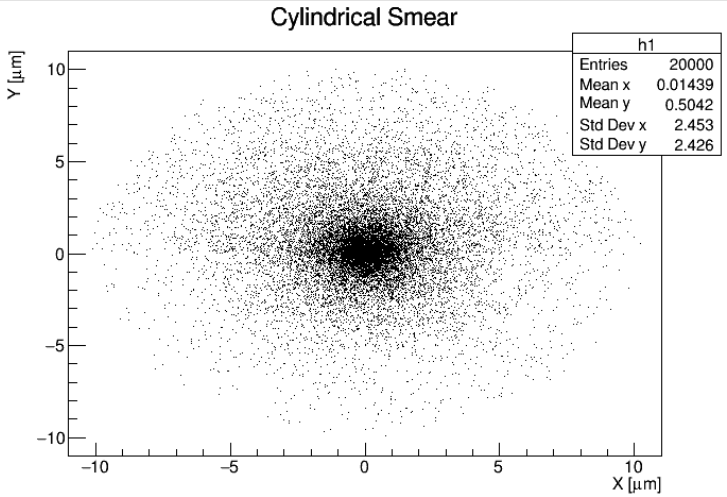
November 19, 2020

2D to 3D Smearing

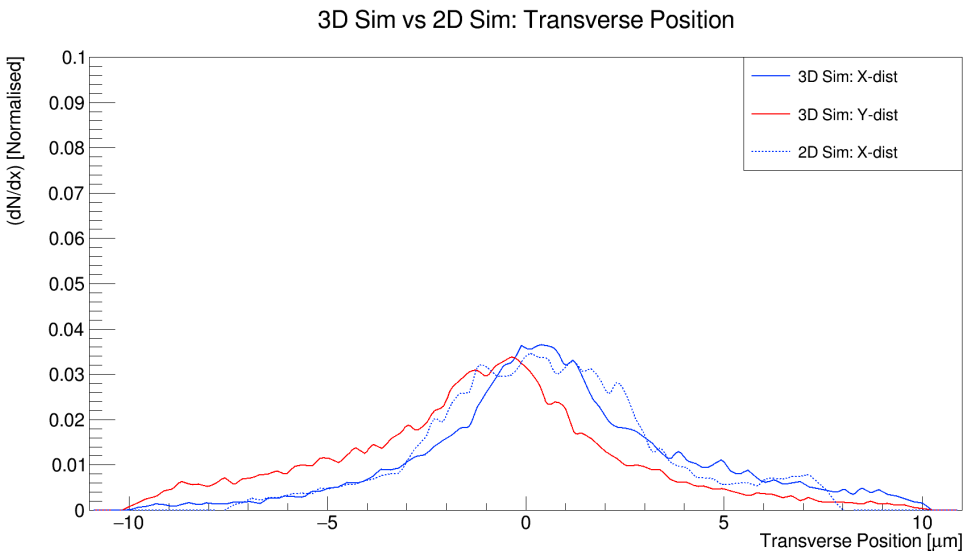
Comparison of a 3D simulation compared to smearing methods when sampling x-plane:

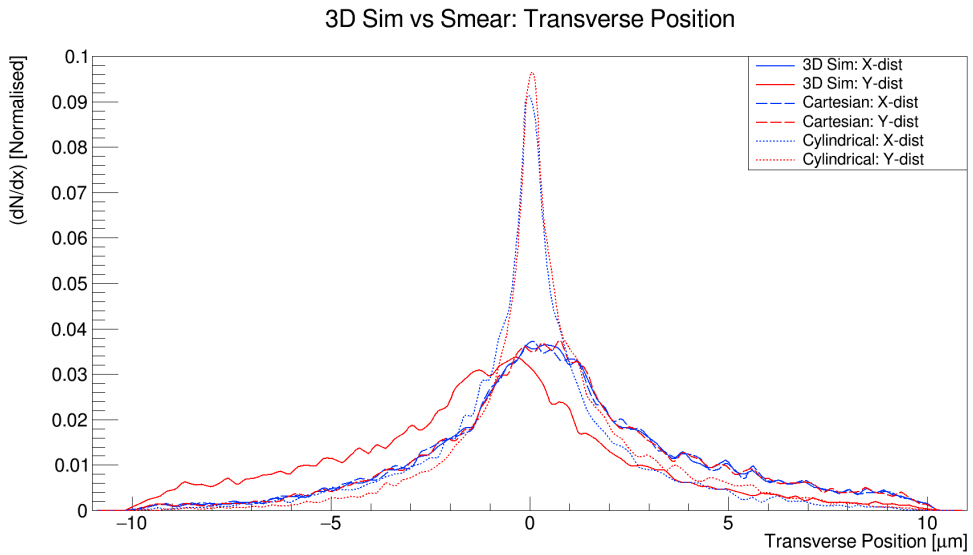




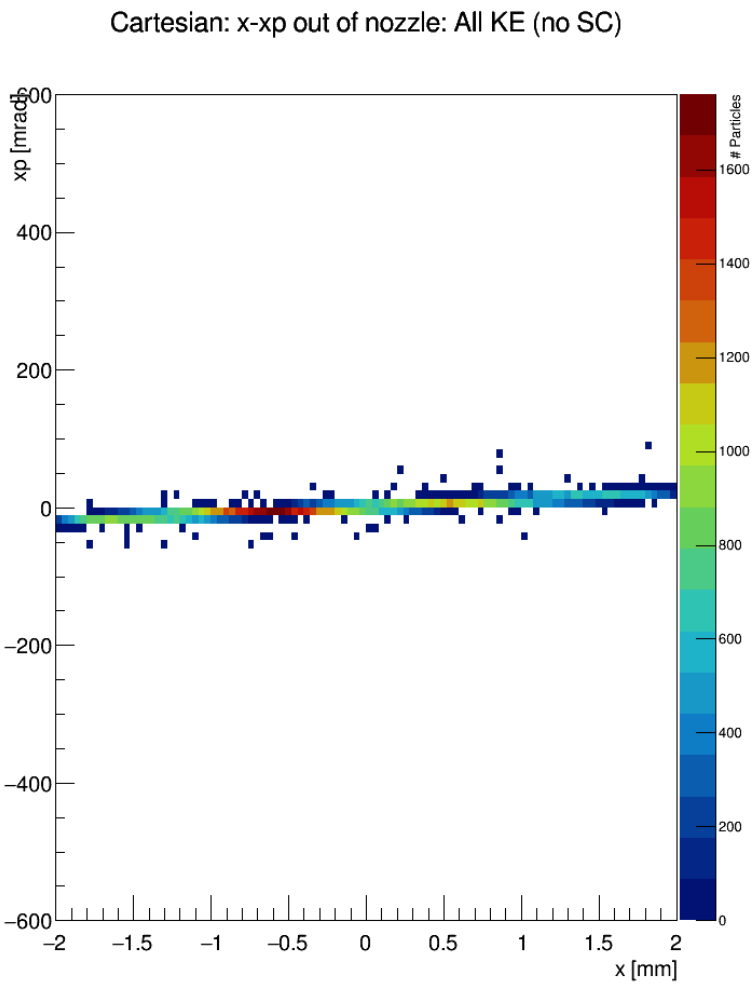


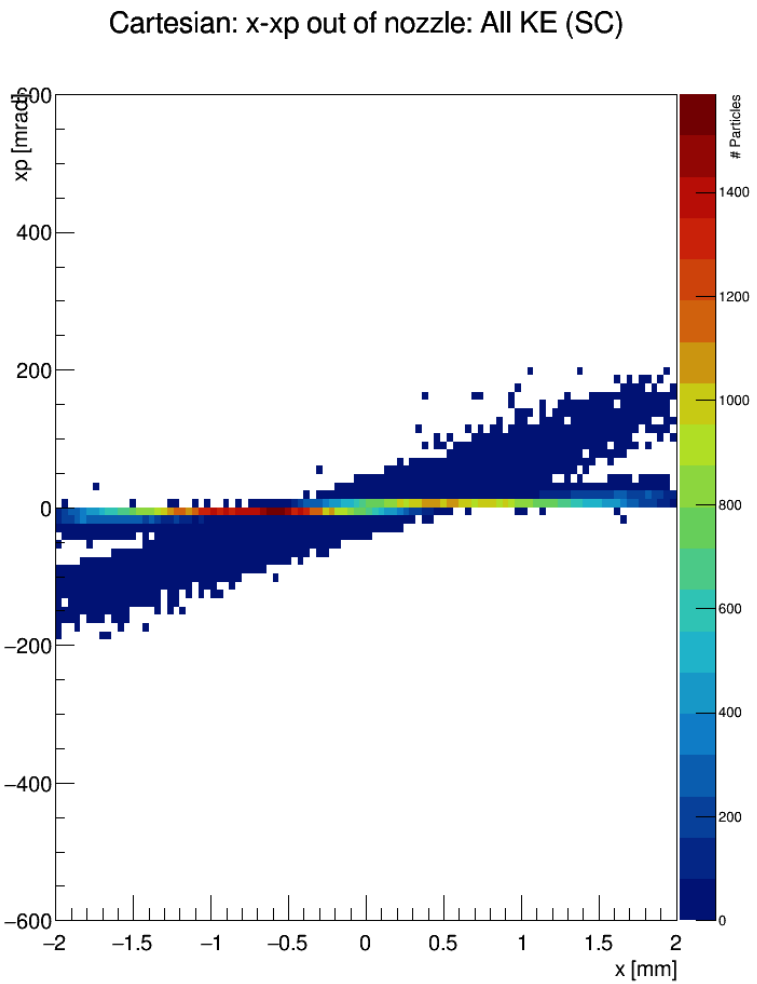
2D to 3D Smearing 1D Comparison





Space Charge with Cartesian Smear

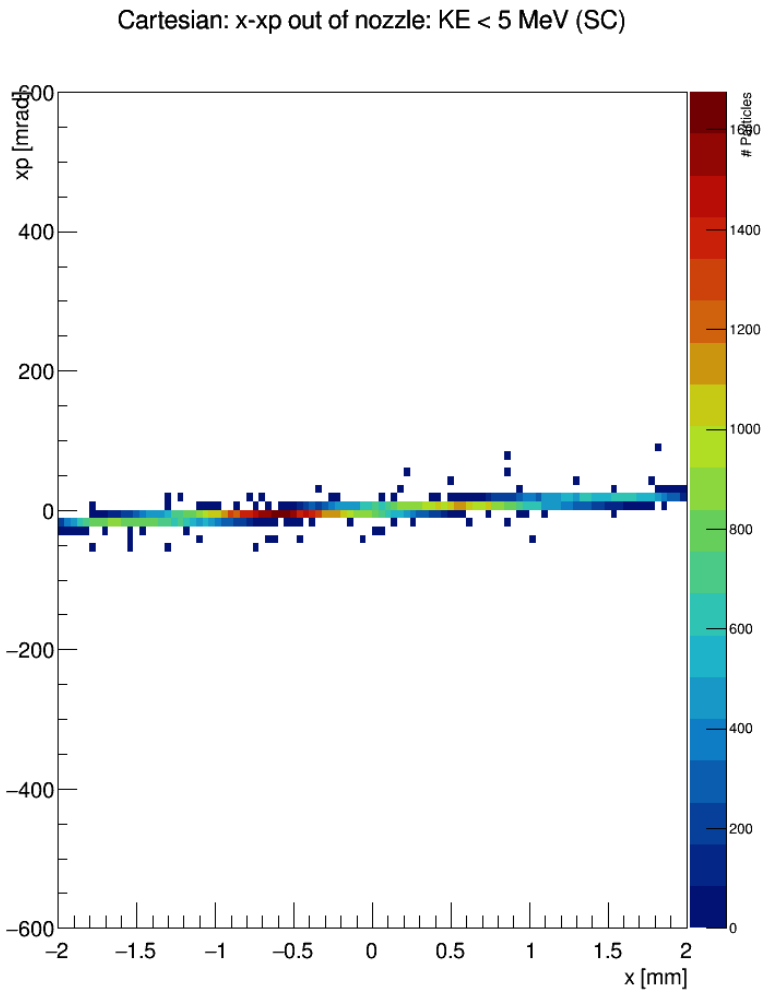


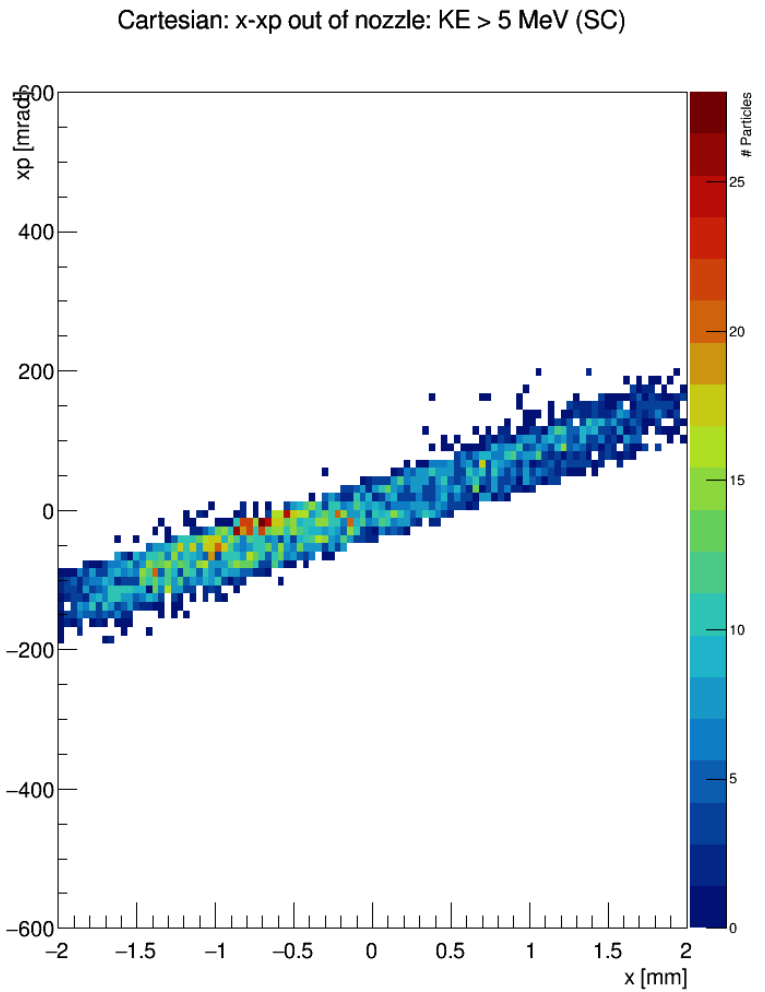


- Presence of space charge seems to split x-xp phase space into two parts one higher energy and one lower energy.

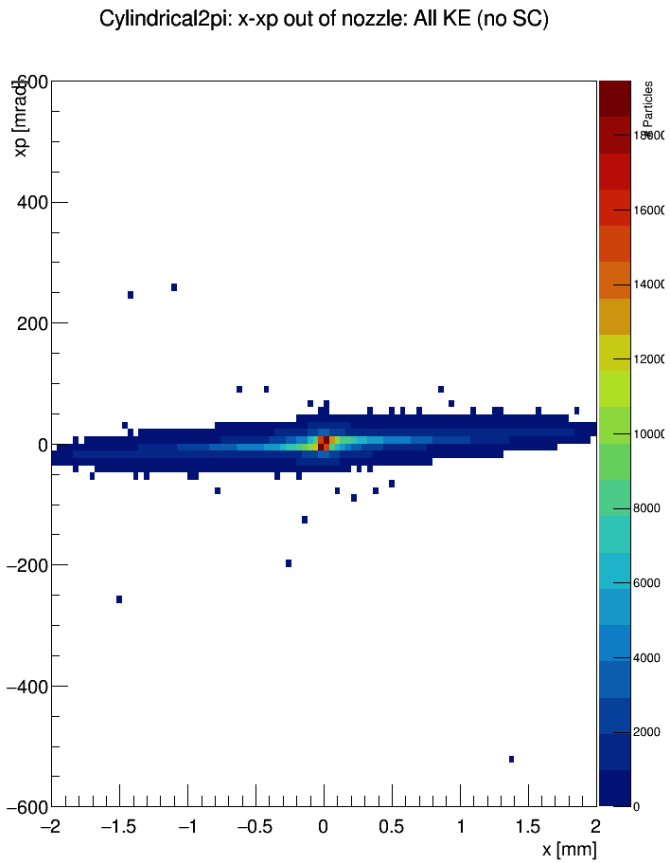
Space Charge with Cartesian Smear

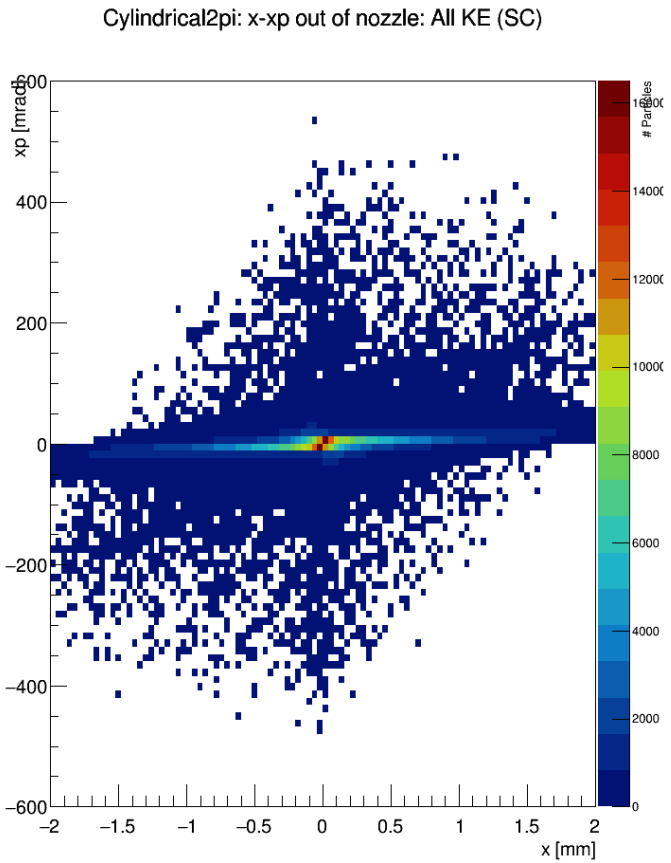
Space charge x-xp phase space with KE cuts:





Space Charge with Cylindrical2pi Smear

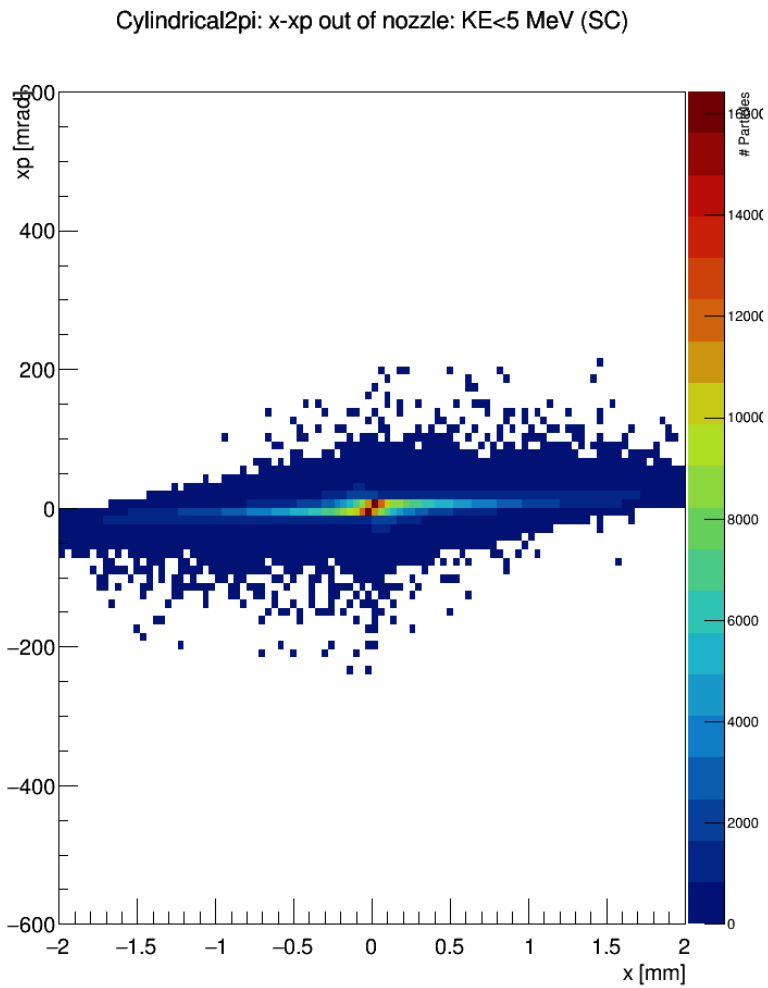


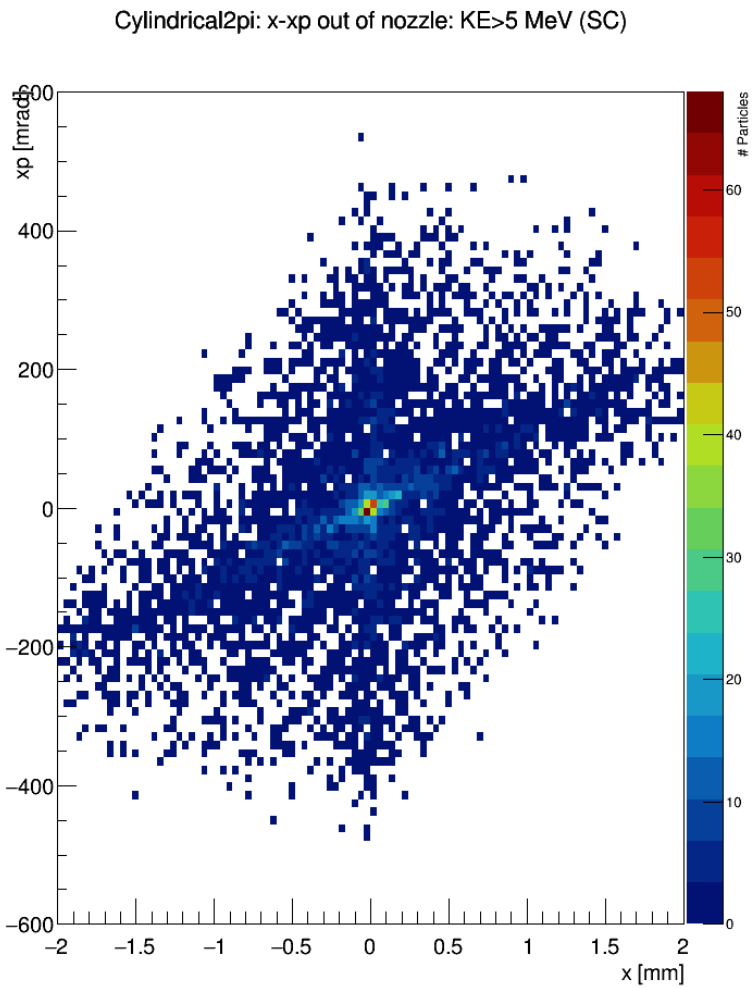


- Seems like the normalised momentum increases by about a factor of 10 for both smearing methods.
- But the cylindrical smearing method has about 2 times greater normalised momentum both with and without space charge.

Space Charge with Cylindrical2pi Smear

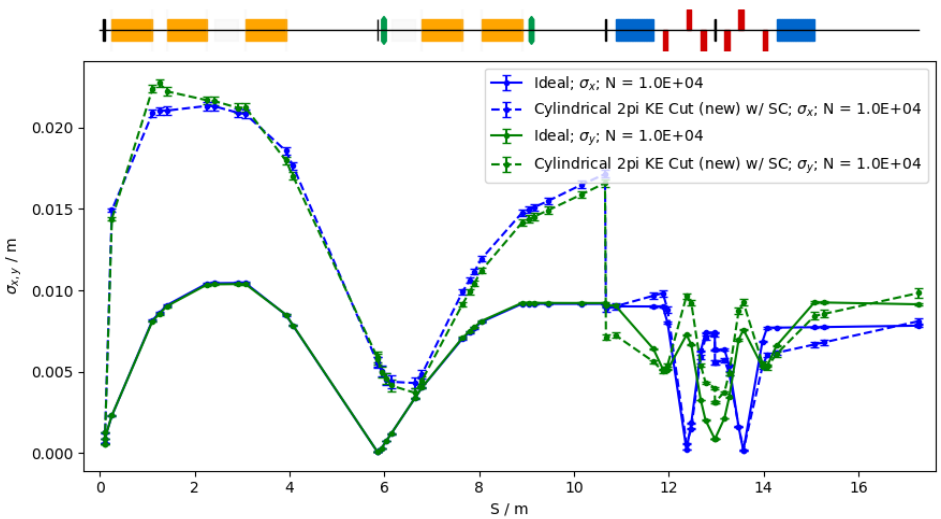
Space charge x-xp phase space with KE cuts:





Evolution of SC Distributions

Cylindrical2pi



Cartesian