

Stopping Proton Analysis -MCC12 SCE Calibration Validation

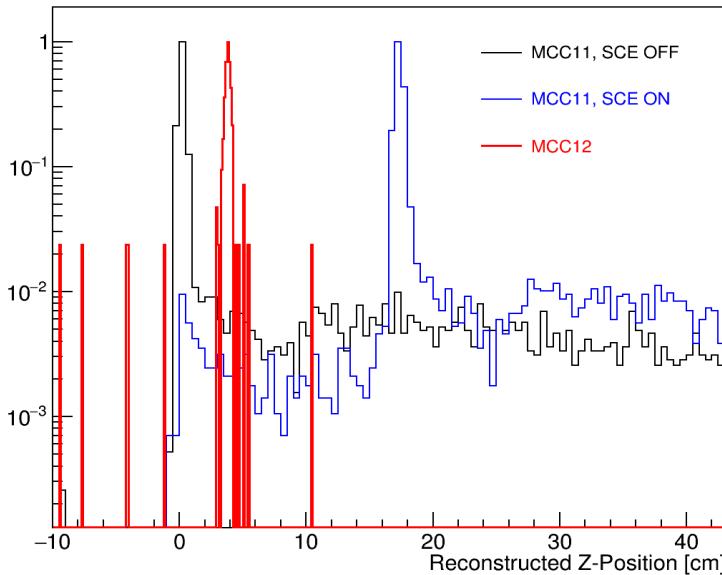
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ProtoDUNE DRA Meeting
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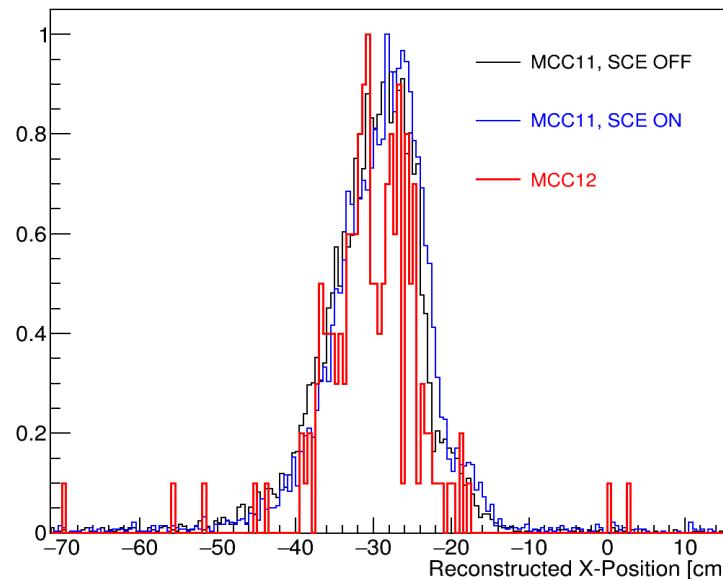
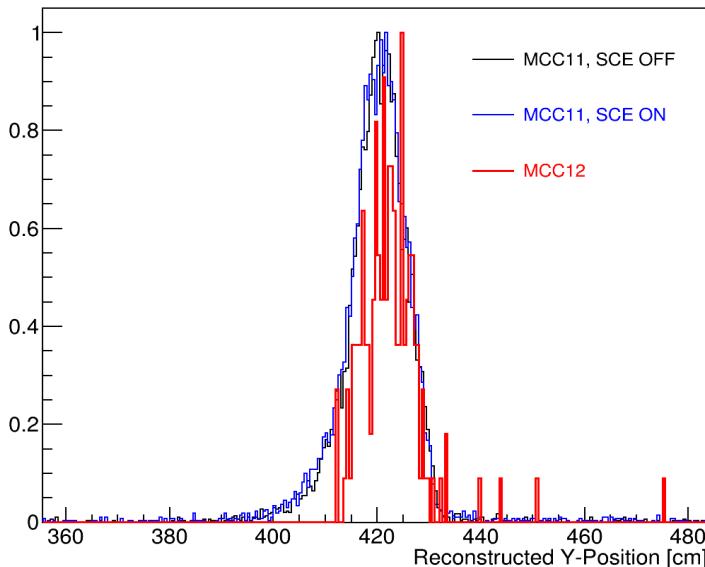
Outline

- Validation of the new MCC12 test sample using the 1 GeV/c stopping protons
 - Compare the MCC12 sample with the MCC11 high statistics sample

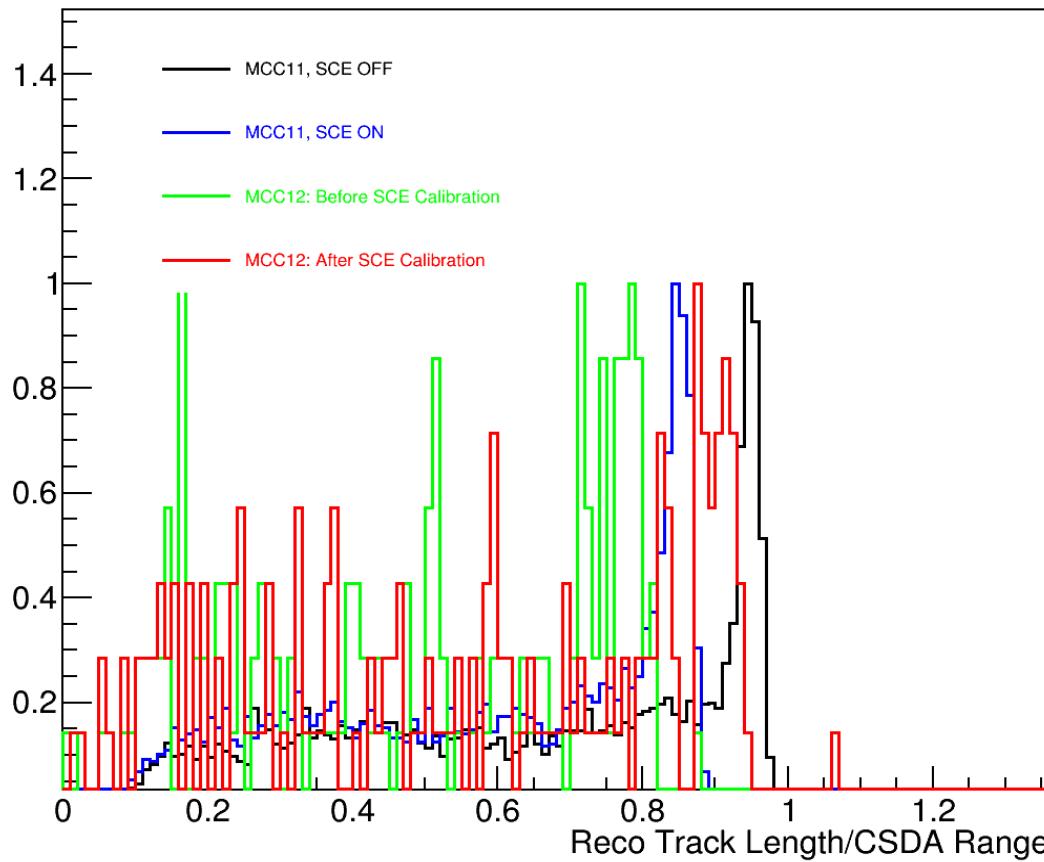
Reco Track: Start Position



	Z [cm]	Y [cm]	X [cm]
MCC11 SCE OFF	0.2 (0.3)	420.8 (4.9)	-3.0 (5.3)
MCC11 SCE ON	17.3 (0.3)	420.7 (5.0)	-2.85 (5.1)
MCC12 SCE Calibration	3.8 (0.2)	421.9 (4.6)	-3.1 (5.0)

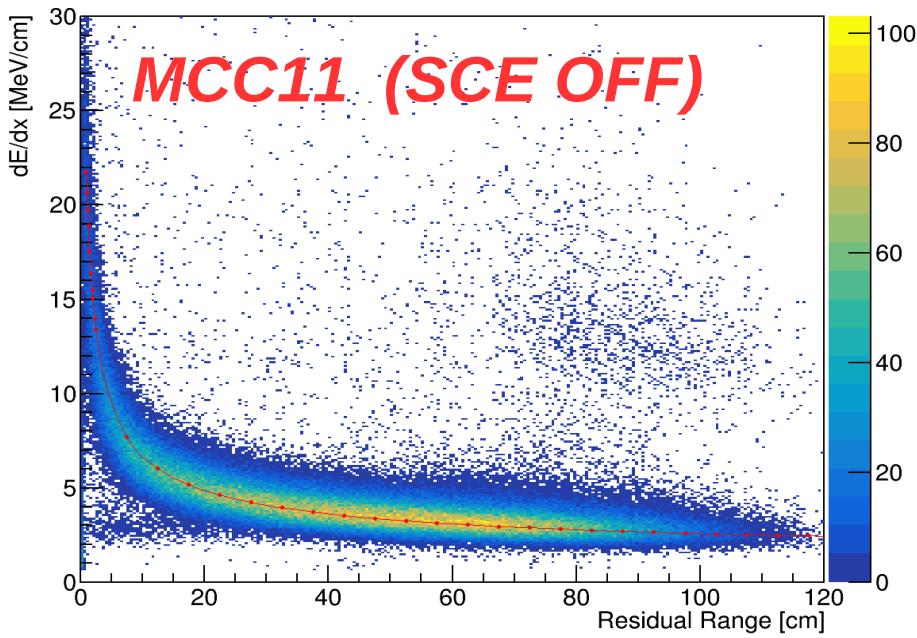
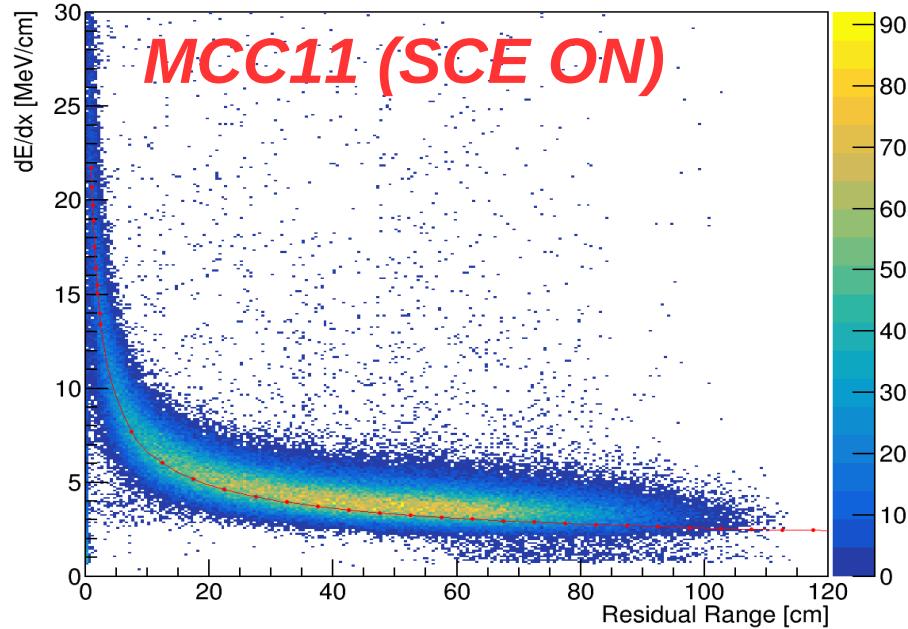


Track Length/CSDA Distributions

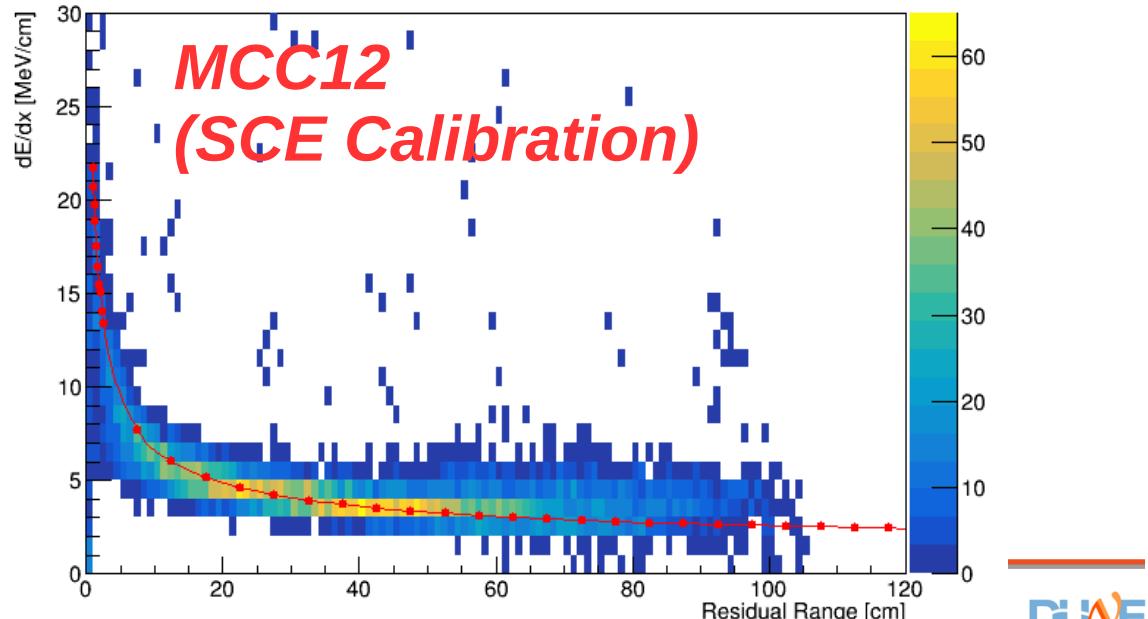


	MCC 11		MCC 12	
	SCE OFF	SCE ON	Before SCE calibration	SCE calibration
Mean	0.947	0.852	0.780	0.878
Sigma	0.021	0.026	0.045	0.049

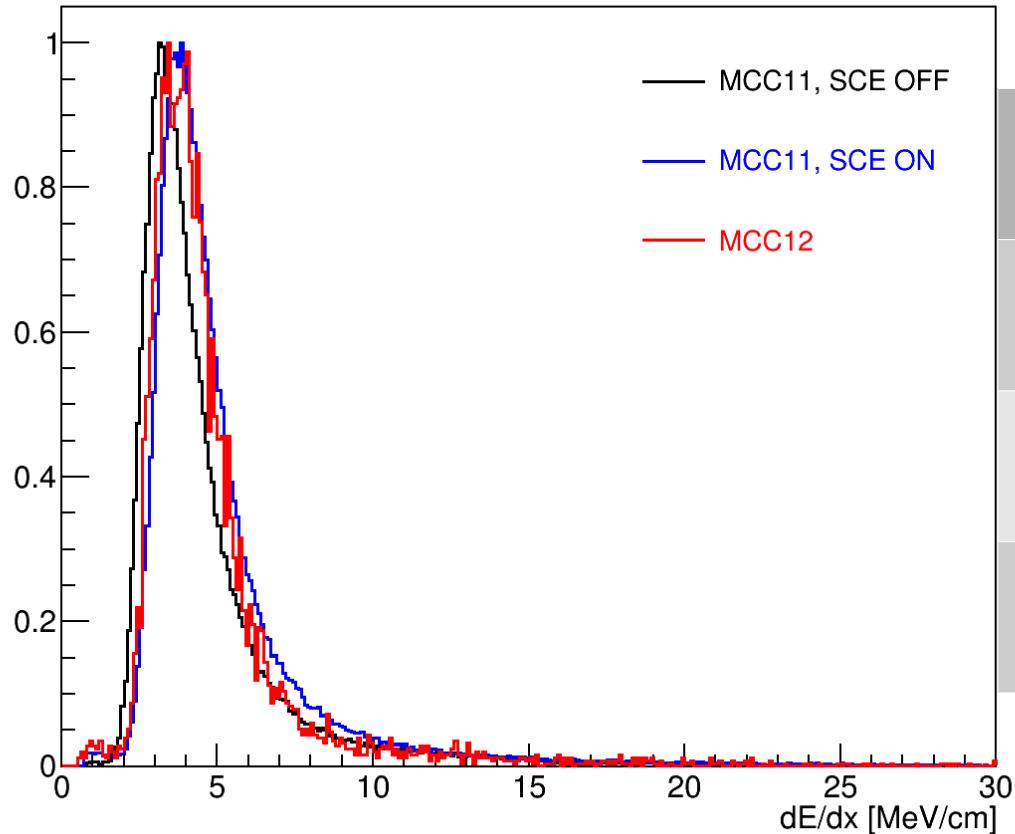
dE/dx v.s. Residual Range



→ Use Mike's E-field map & Ajib's calibration scheme for calibration



MCC11 & MCC12 Comparison: dE/dx Distributions



	Peak Position	Resolution (sigma)
MCC11 SCE OFF	3.42	22.8 %
MCC11 SCE ON	3.87	22.7 %
MCC12 SCE Cali.	3.72	25.9 %

Summary & Outlook

- Quick look at the new MCC12 1 GeV/c stopping protons
- Improvenements on the reco start positions & better agreement between the theoretical predicted curve and new MCC12 test sample (dE/dx v.s. residual range)
- Discrepancies in the beginning of tracks
 - $Z \sim 4$ cm & $\Delta(dE/dx) \sim < 1$ MeV/cm
- Next Step:
 - Validation on the new data sample
 - More investigation on the new MCC12 sample
(Any suggestion for checking the new MCC sample is welcome!)