

Top/Heavy Flavor Meeting

SSbar 250 GeV Analysis

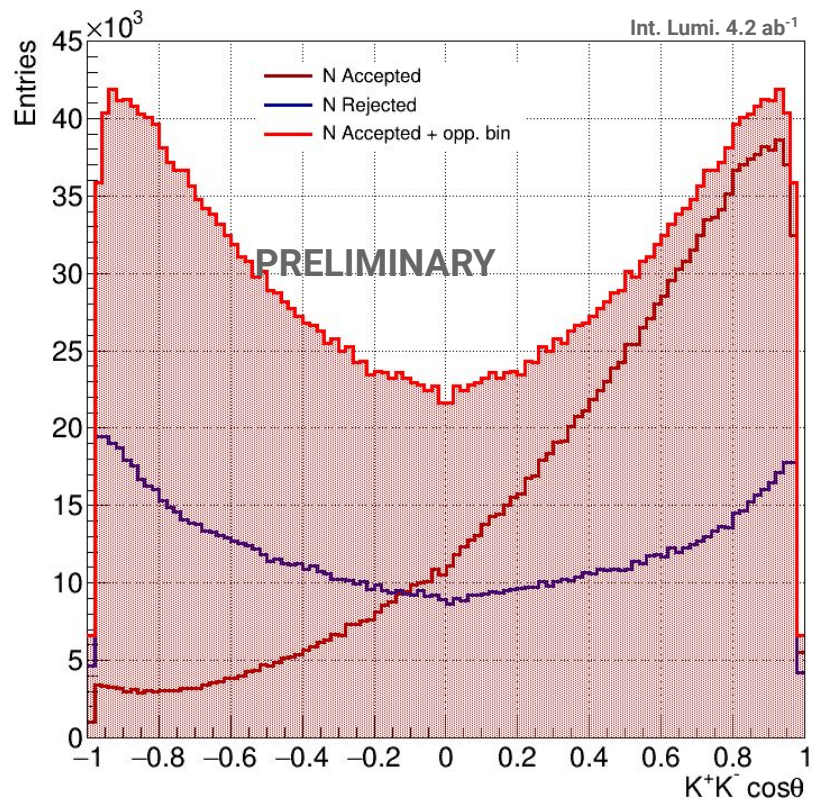
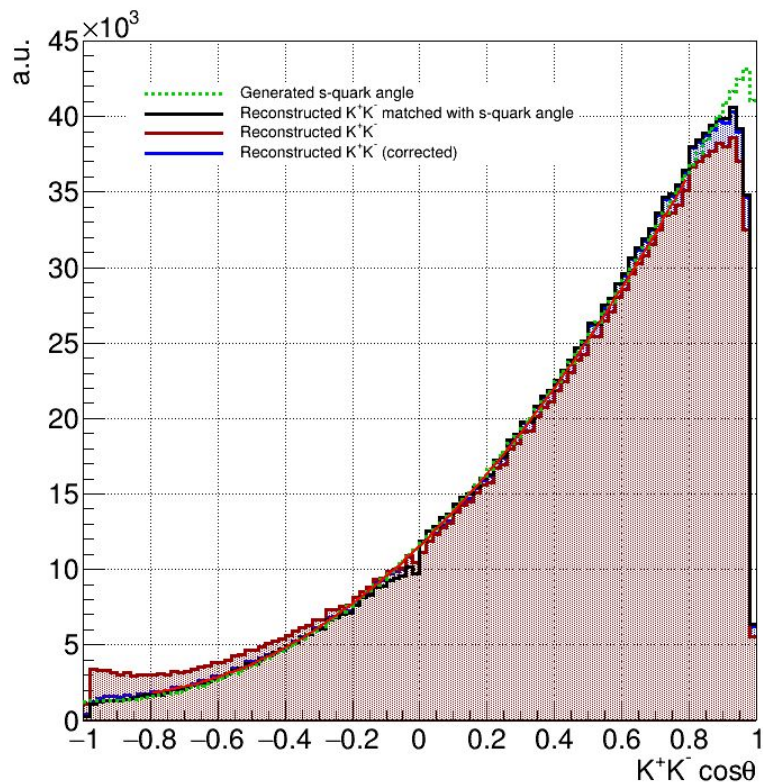
Yuichi Okugawa
Feb. 3rd, 2022



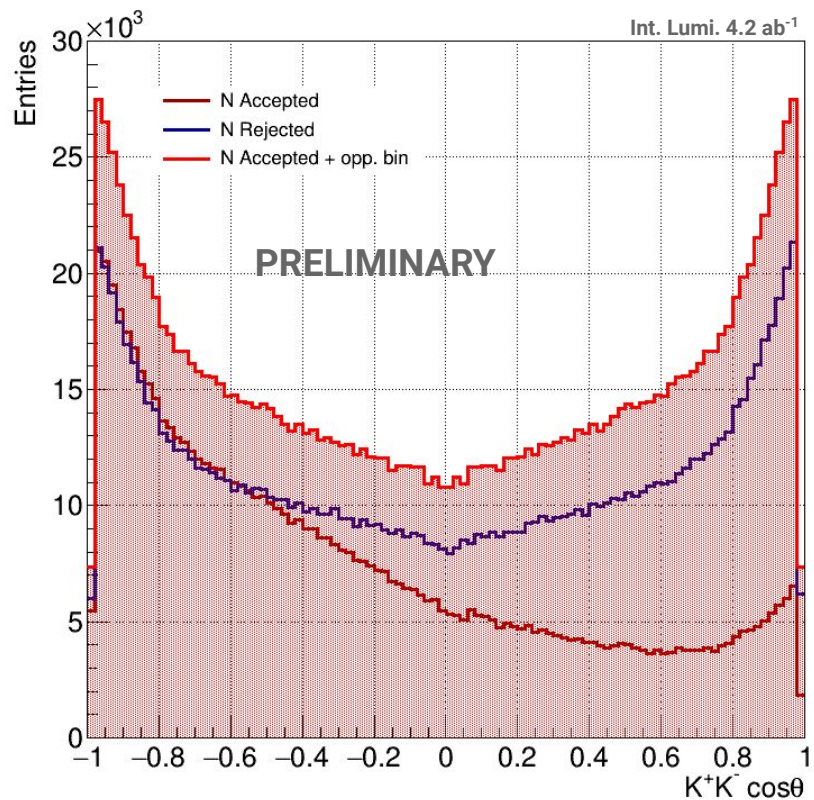
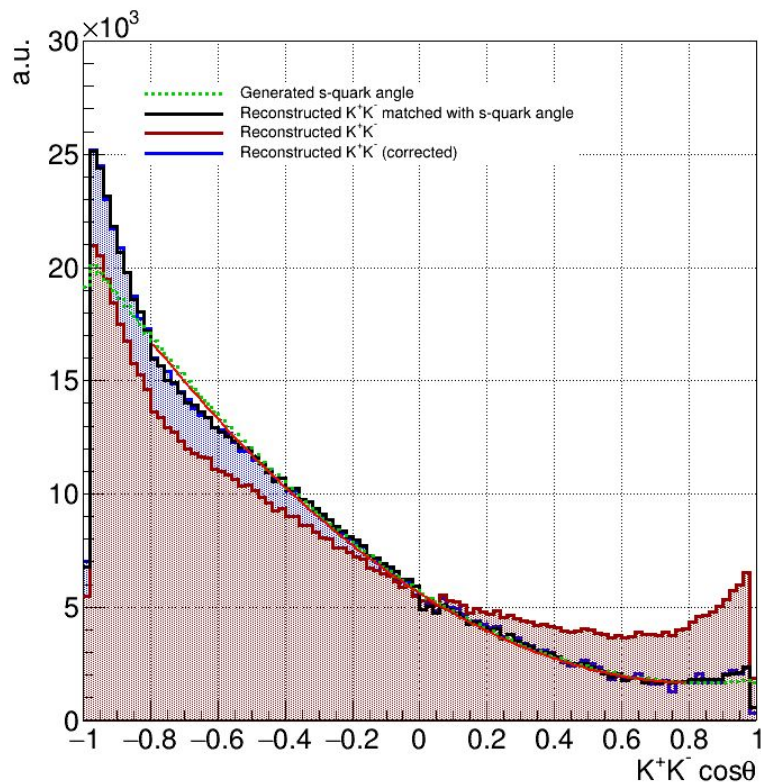
Objectives

- **Mixing BG samples**
 - uu/ss sample mixing in progress
 - Efforts to reconstruct uu from kaon information
- **Investigate the contamination**
 - Possible contamination of Kaon ID from pions
 - Angular, process dependent

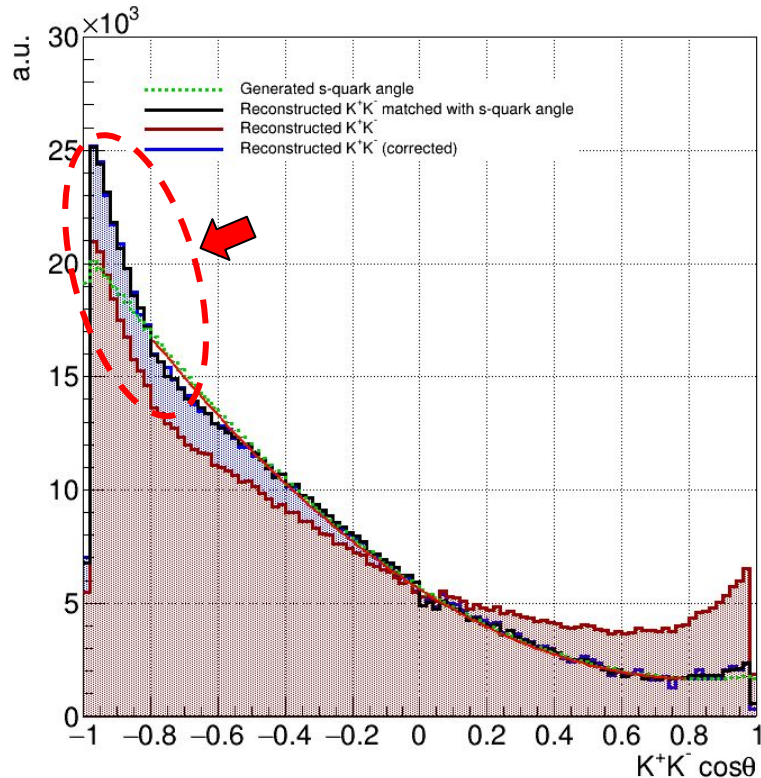
SS Polar Angle



UU Polar Angle



UU Polar Angle

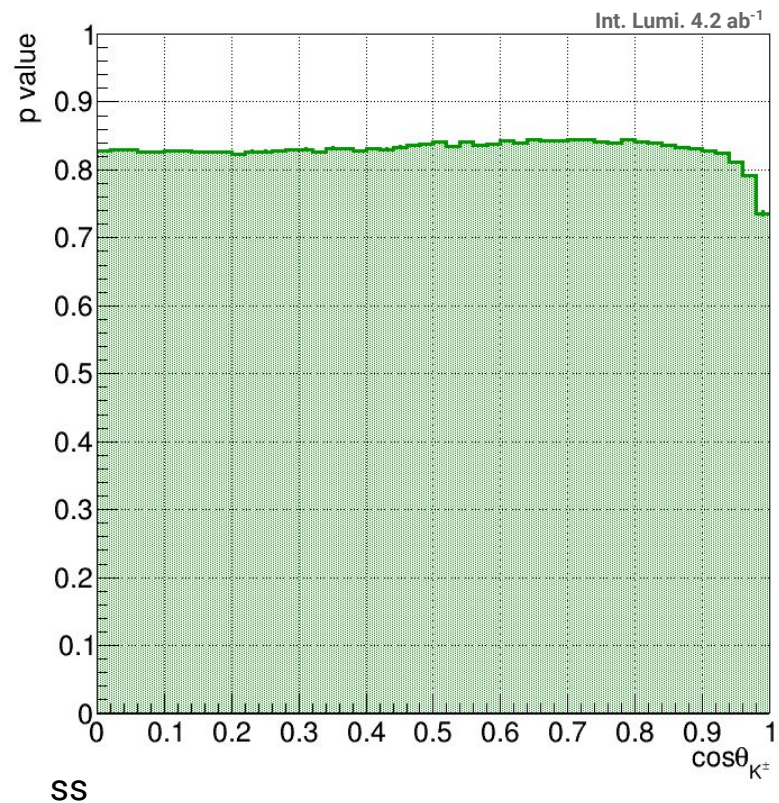
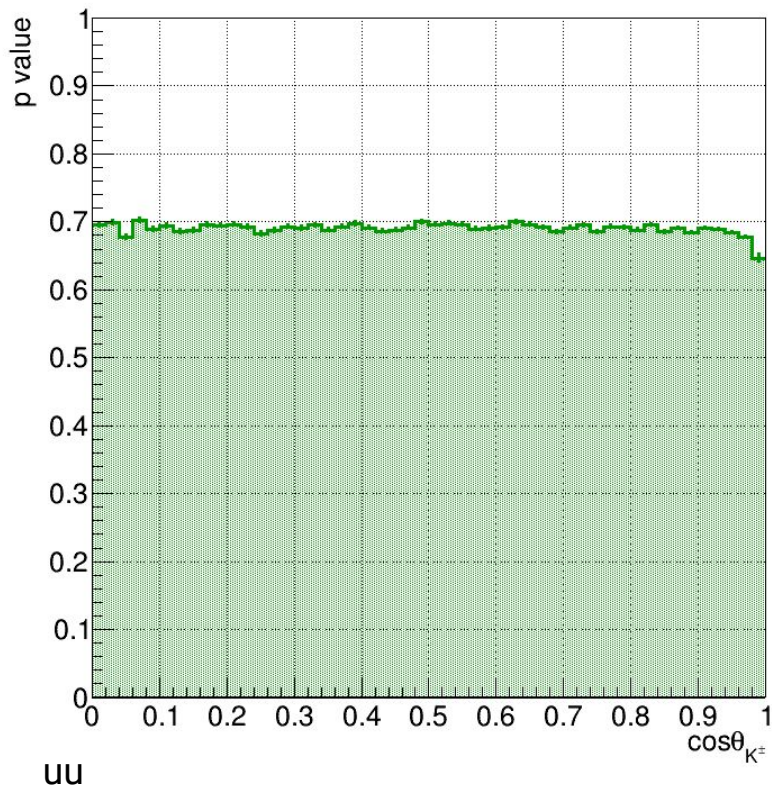


Steep curve at $\cos\theta < -0.8$ observed.

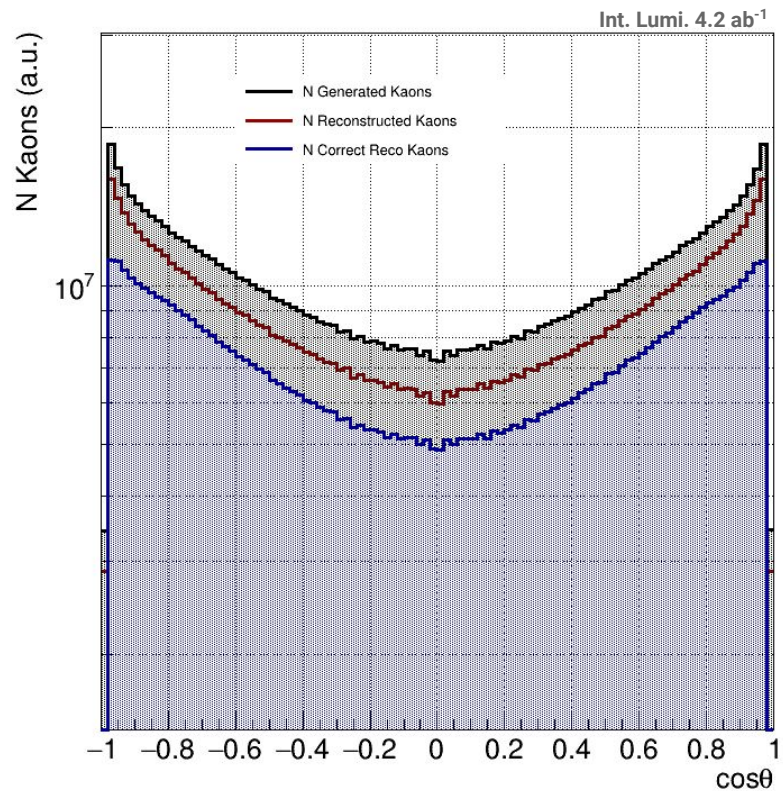
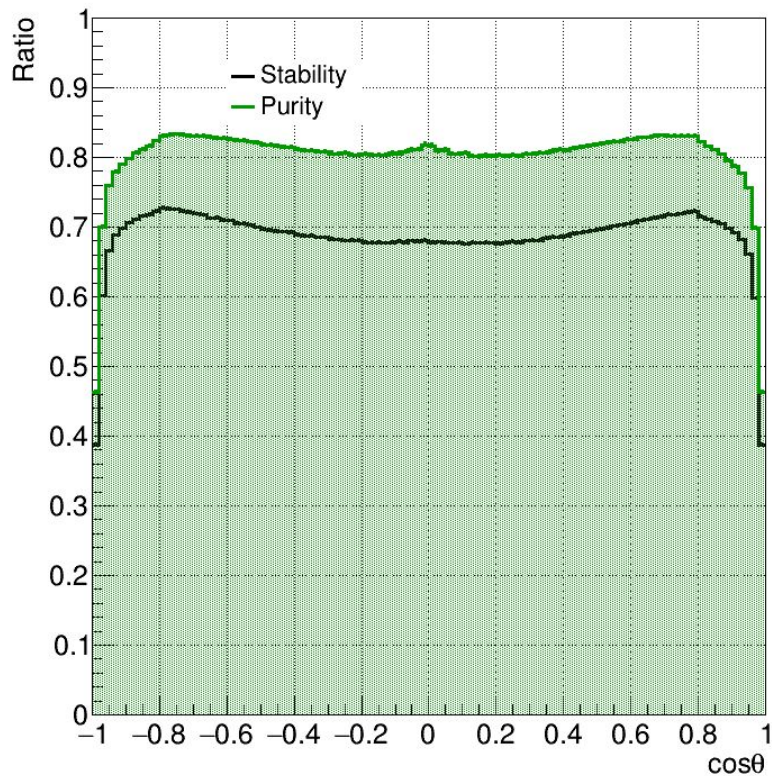
Two hypothesis:

- **Detector acceptance**
Issues with acceptance correction applied to the distribution.
- **Particle mis-ID**
Contamination of Kaon ID due to the overwhelming number of pions.

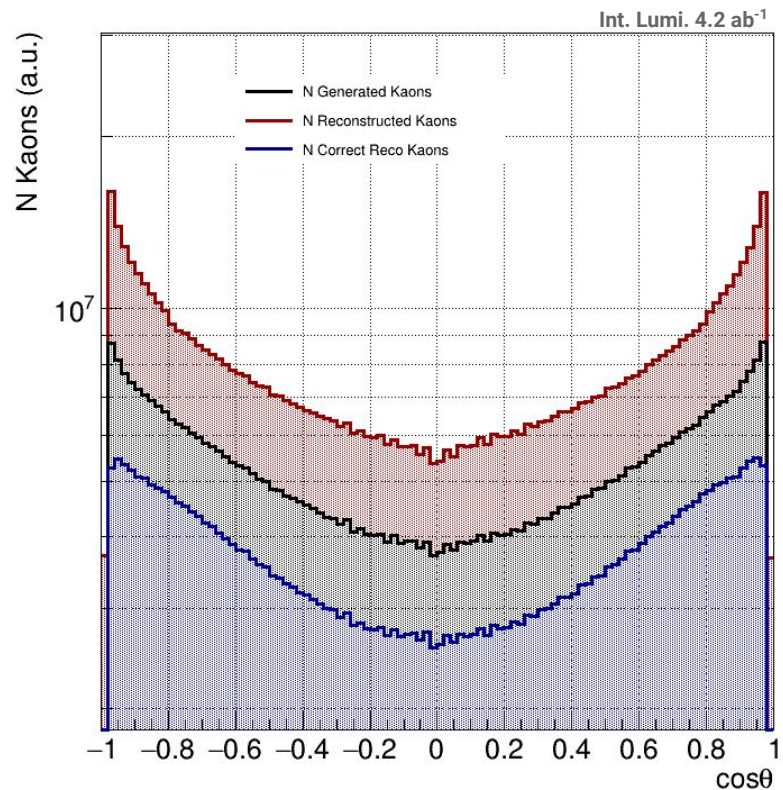
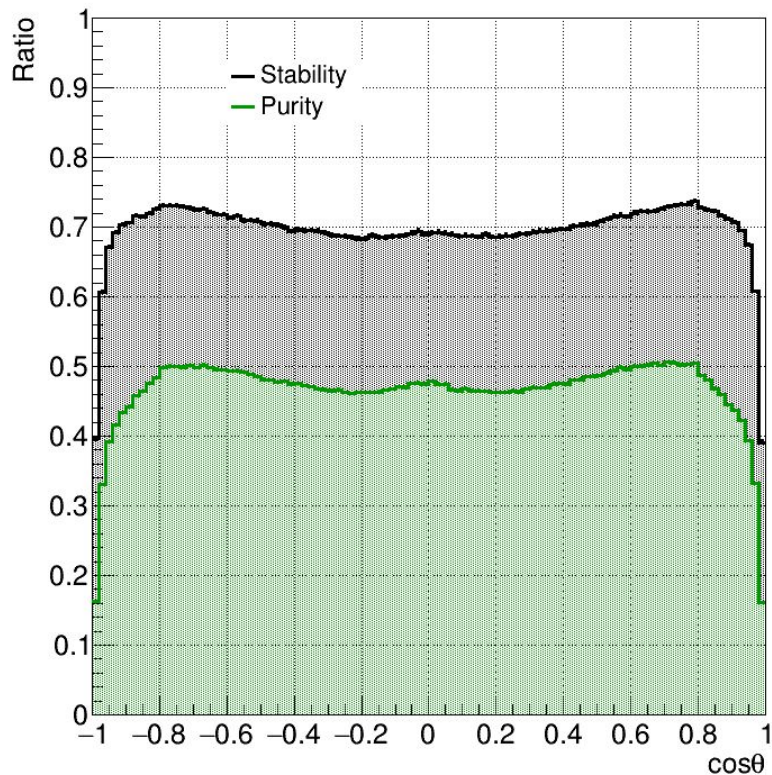
P Values



Stability & Purity (SS)

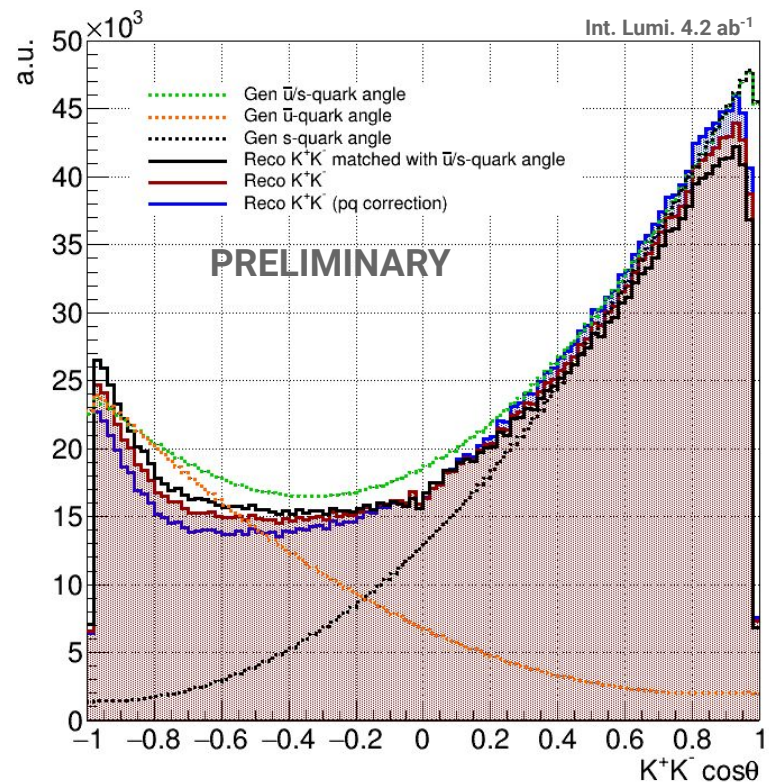


Stability & Purity (UU)



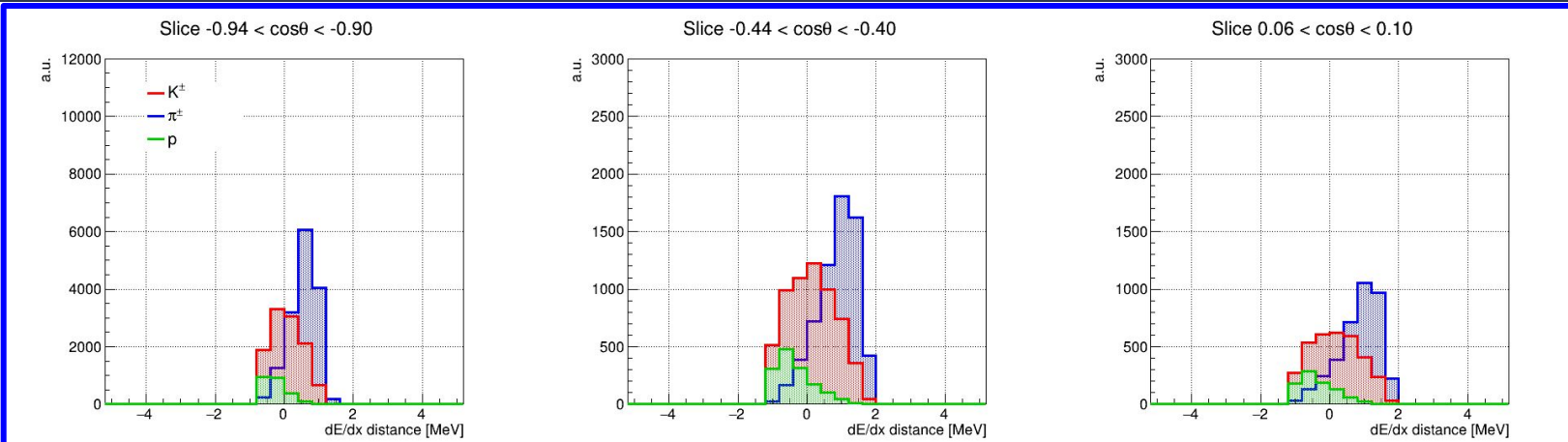
US Polar Angle

- Mixture of uu/ss samples
 - Integrated Lumi: 4.2 ab⁻¹
- Normalization
 - **Green** and **black** dotted line were normalized to the $0.80 < \cos \theta < 0.94$ region
 - **Orange** dotted line was normalized to the $-0.90 < \cos \theta < 0.80$ region

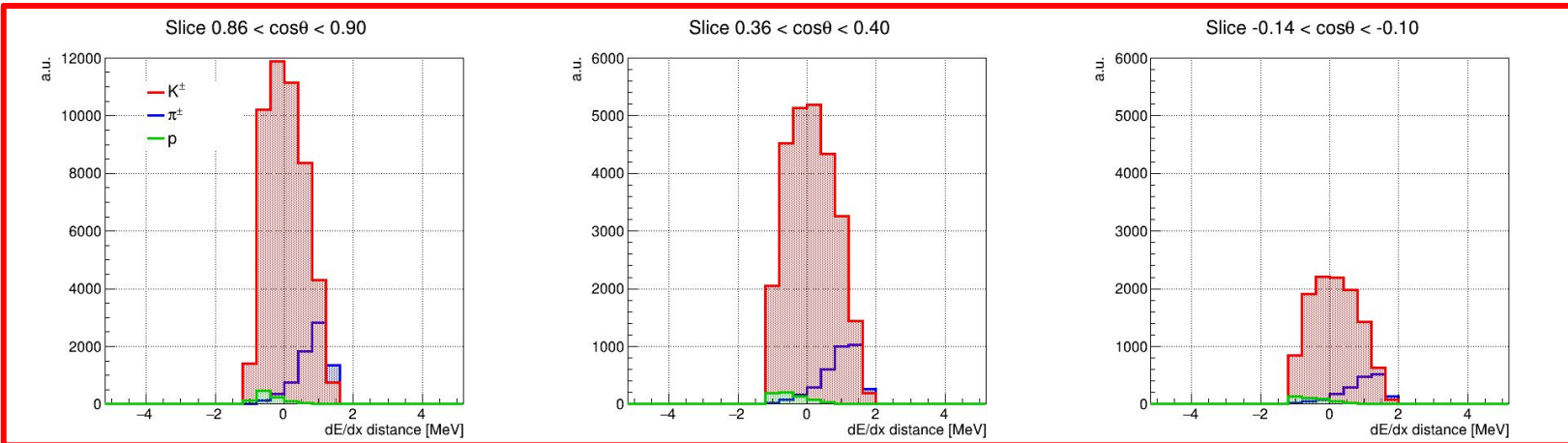


dE/dx distances

UU

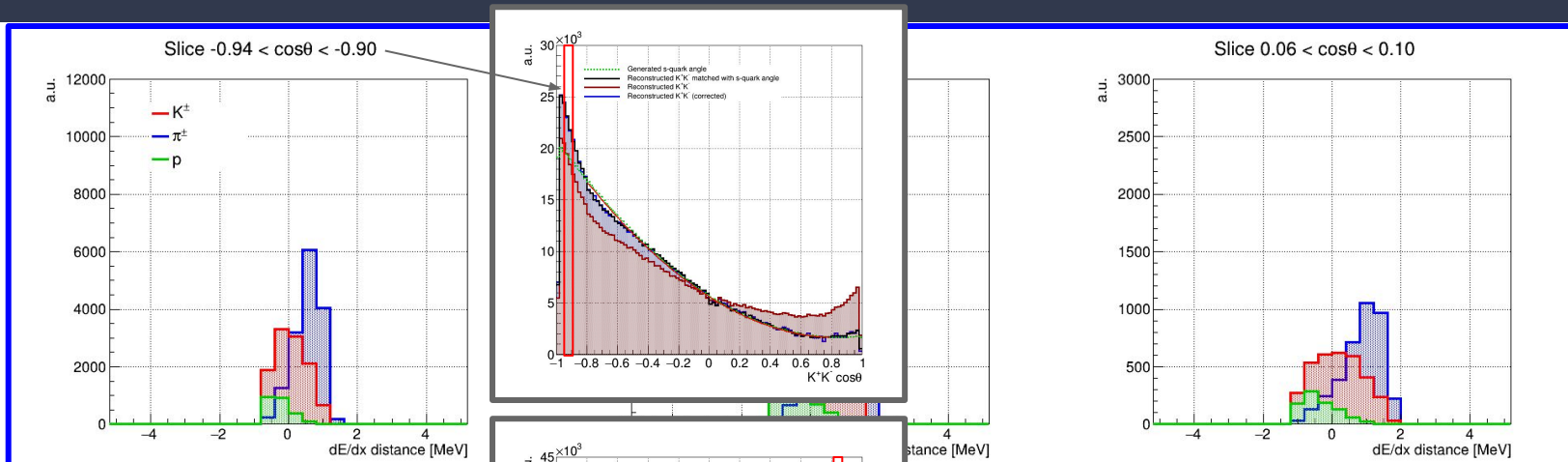


SS

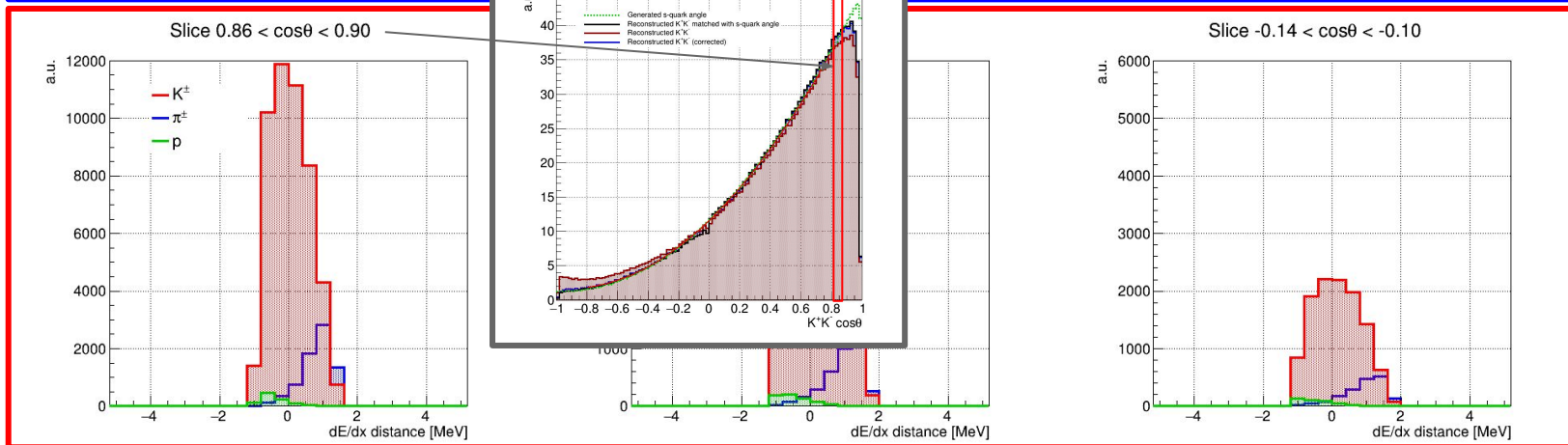


dE/dx distances

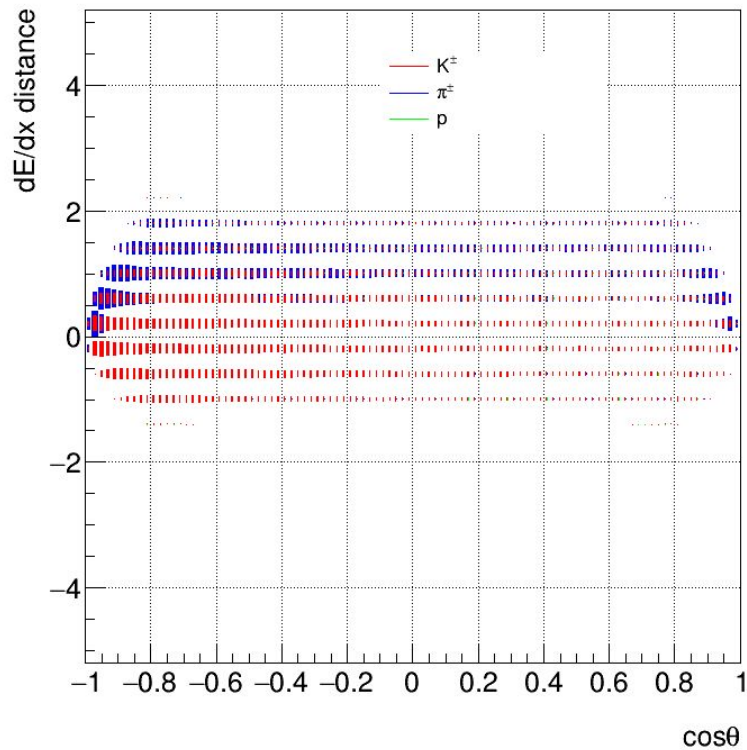
UU



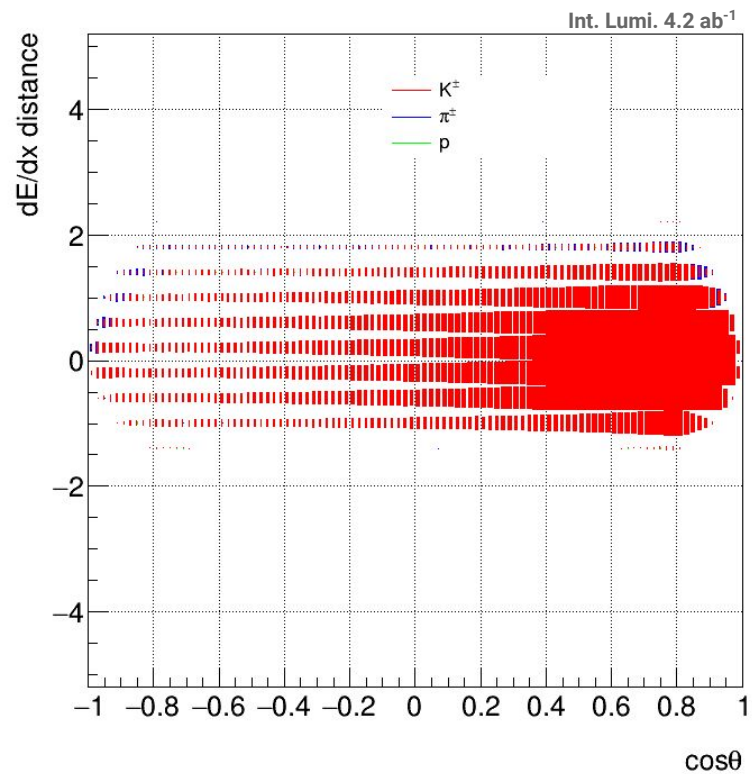
SS



dE/dx distance vs $\cos \theta$

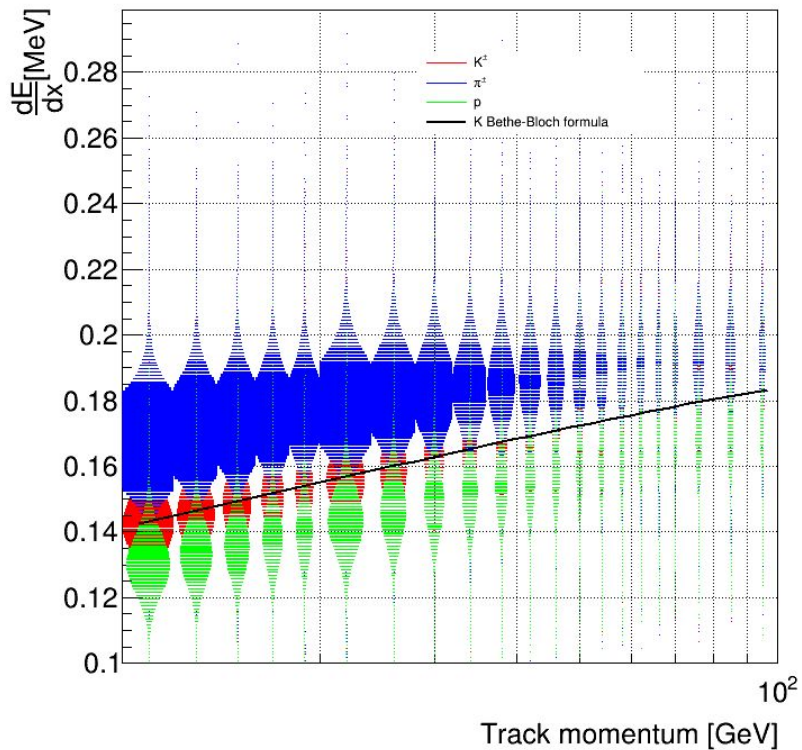


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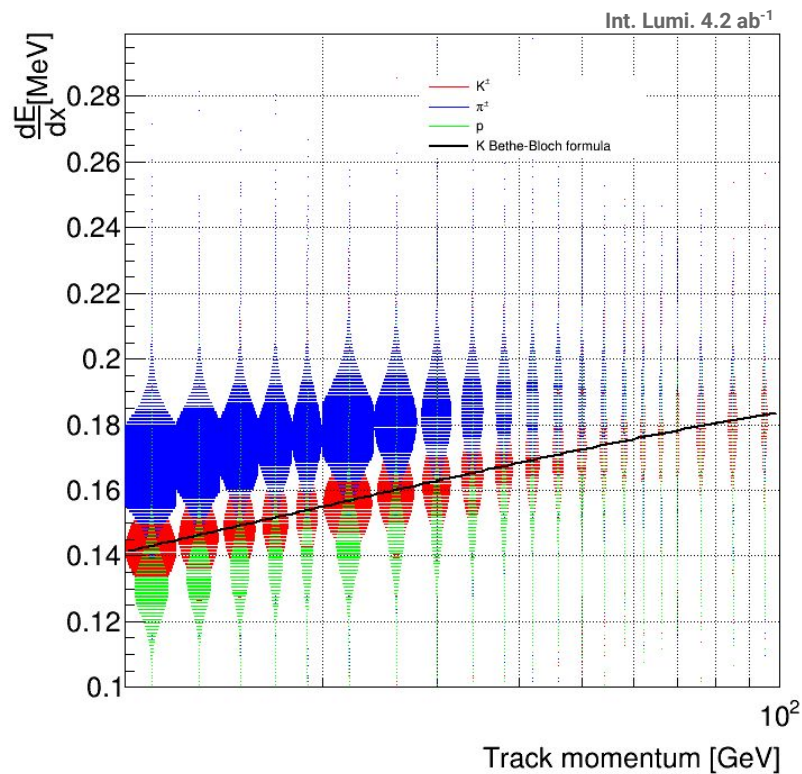


ss

dE/dx vs p (before Selection)

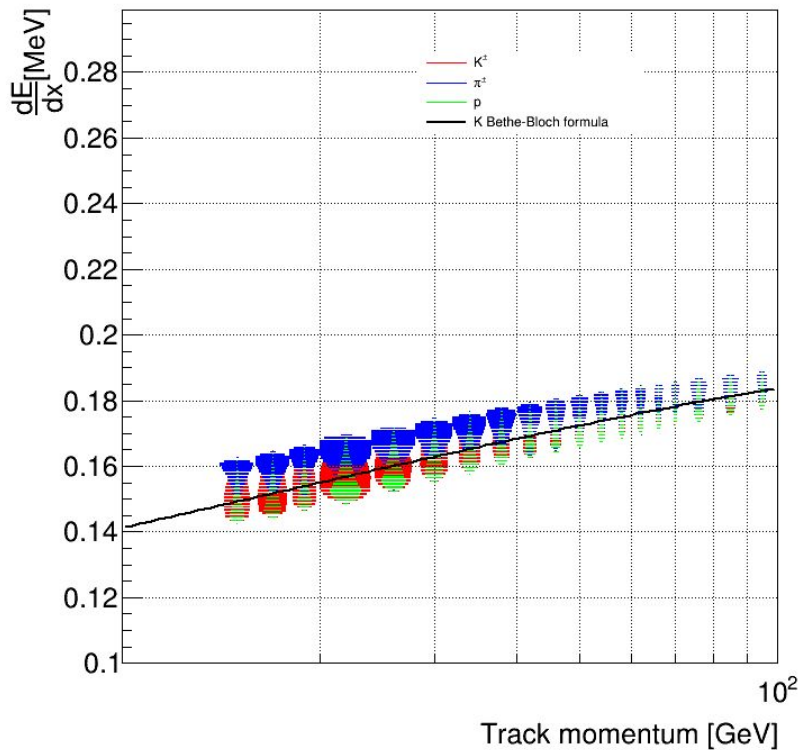


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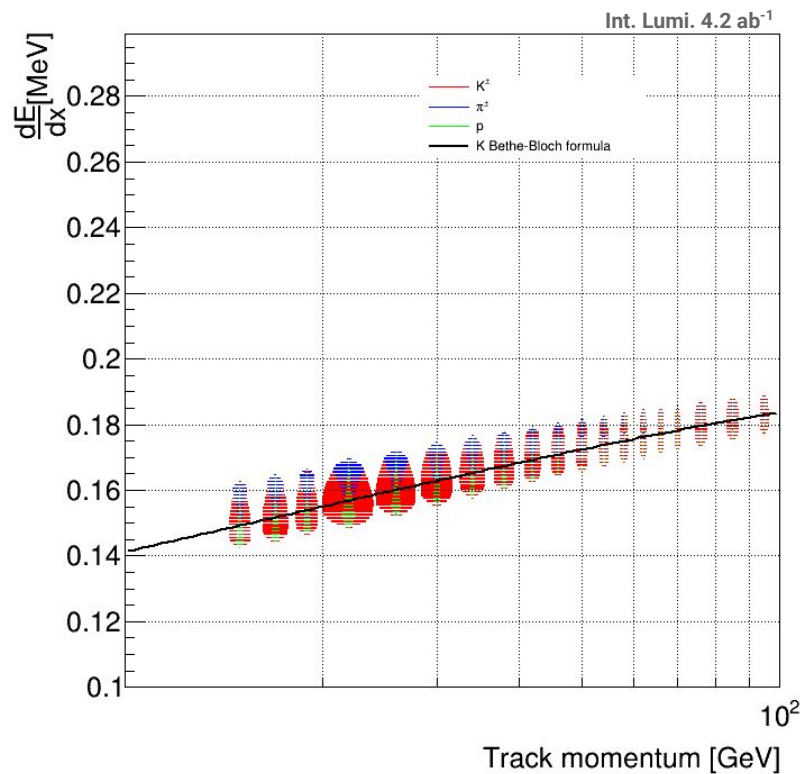


ss

dE/dx vs p (after Selection)

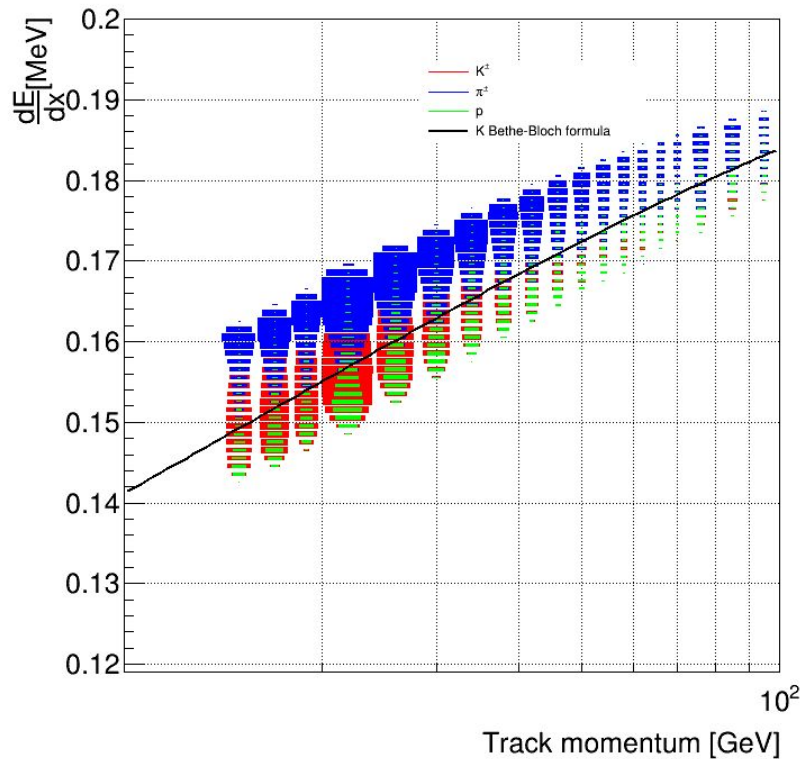


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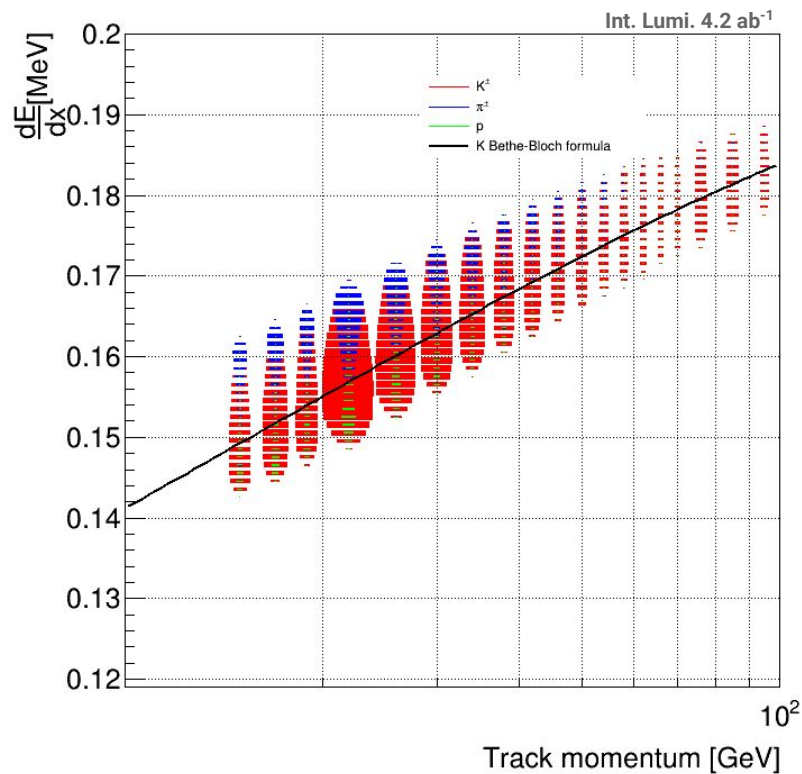


ss

dE/dx vs p (after Selection, zoom)



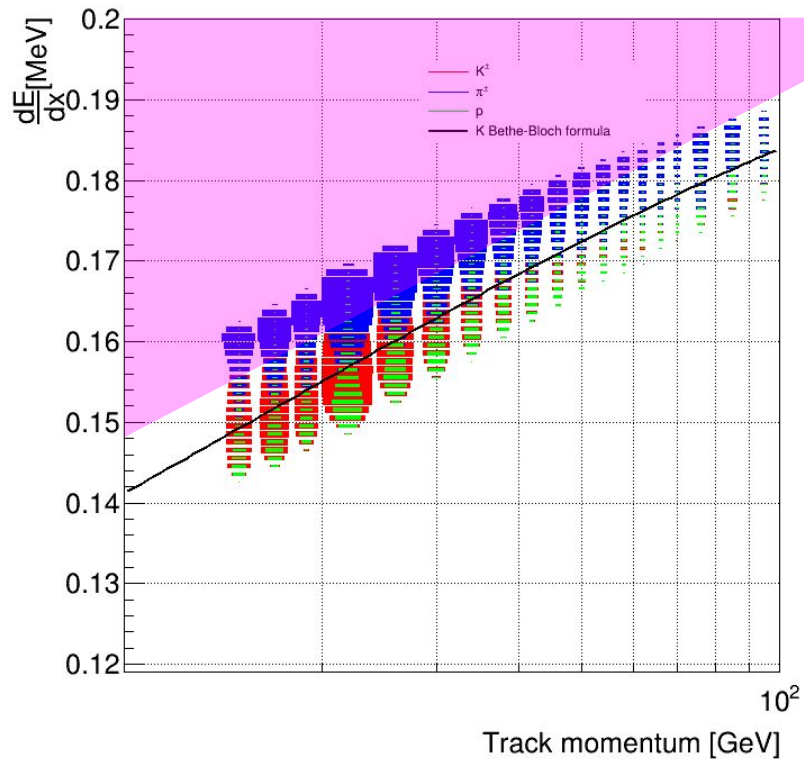
uu



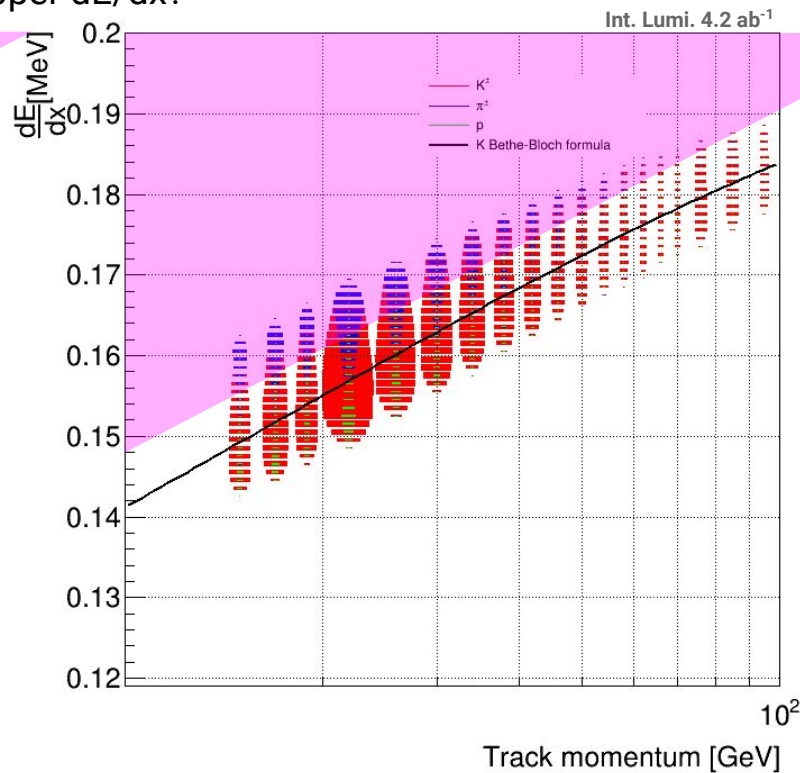
ss

dE/dx vs p (after Selection, zoom)

Set a cut on upper dE/dx



uu



ss

Summary & Prospects

Summary

- **Mix Samples**
 - ss/uu samples mixed
 - pq-method applied
- **Steep Curve Problem**
 - Acceptance problem? Particle mis-ID problem?
 - If acceptance issue, inconsistent effect between ss & uu
 - If mis-ID, can we salvage with cuts?

Prospects

- **Depends on the outcome**
 - If acceptance, correction needs to be revised
 - If mis-ID, can cut on the polar angle (worst case..)