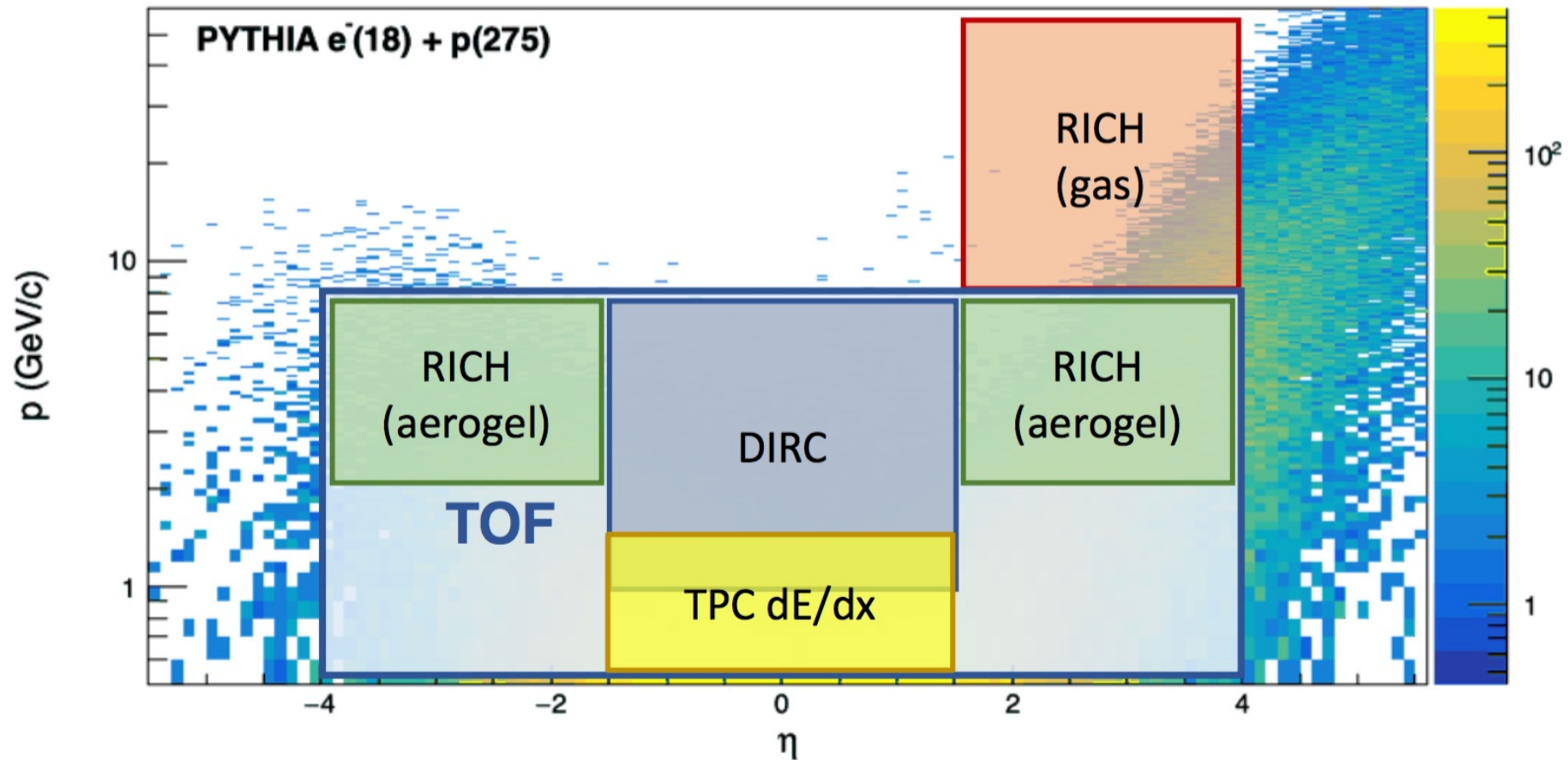


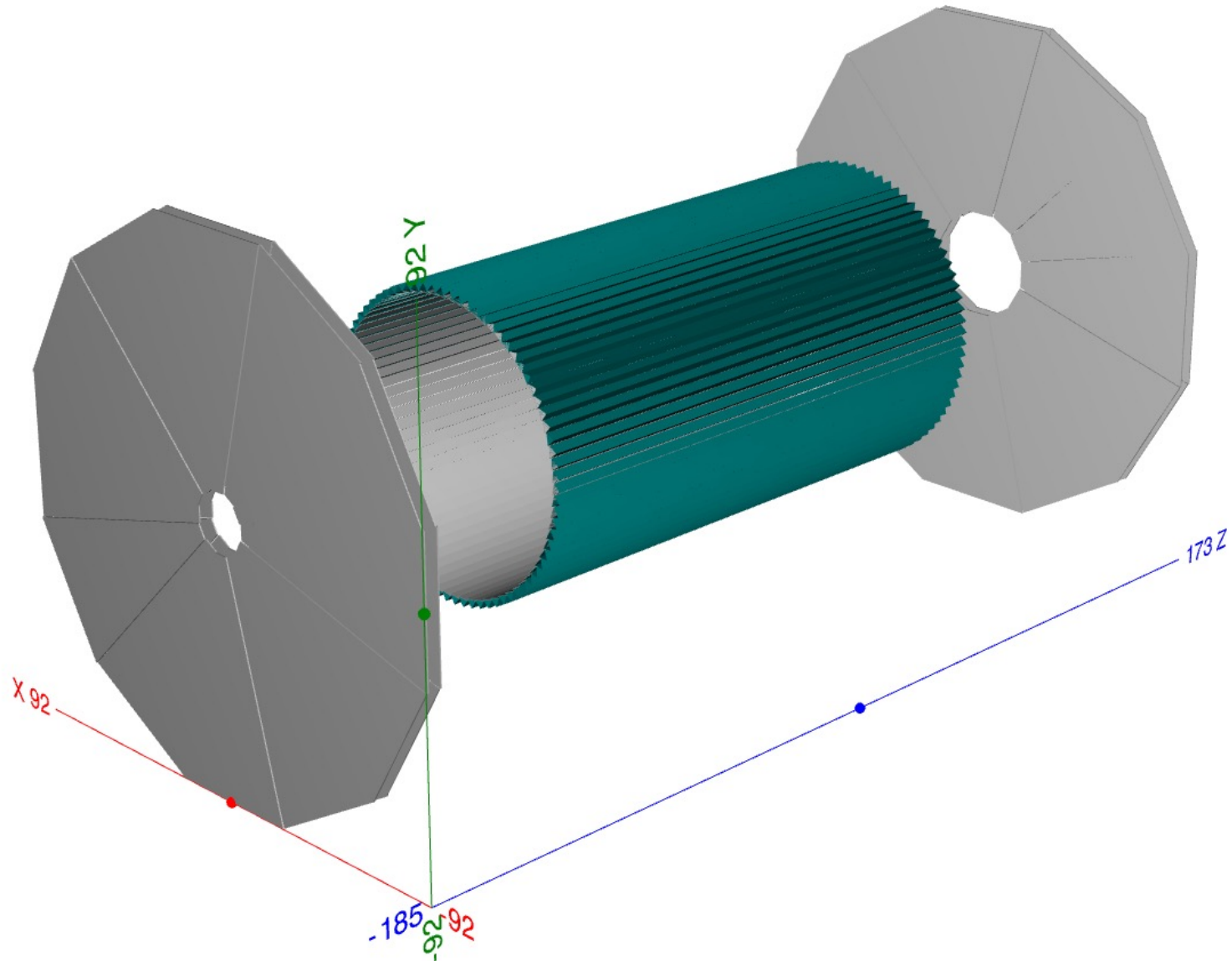
# AC-LGAD TOF - Simulation

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# AC-LGAD TOF Detectors for EIC – eRD112



## **Barrel TOF**

Single layer with 30 ps resolution and 2% $X_0$  material budget per layer

## **Forward TOF**

Double layer with 25 ps resolution and 5% $X_0$  material budget per layer

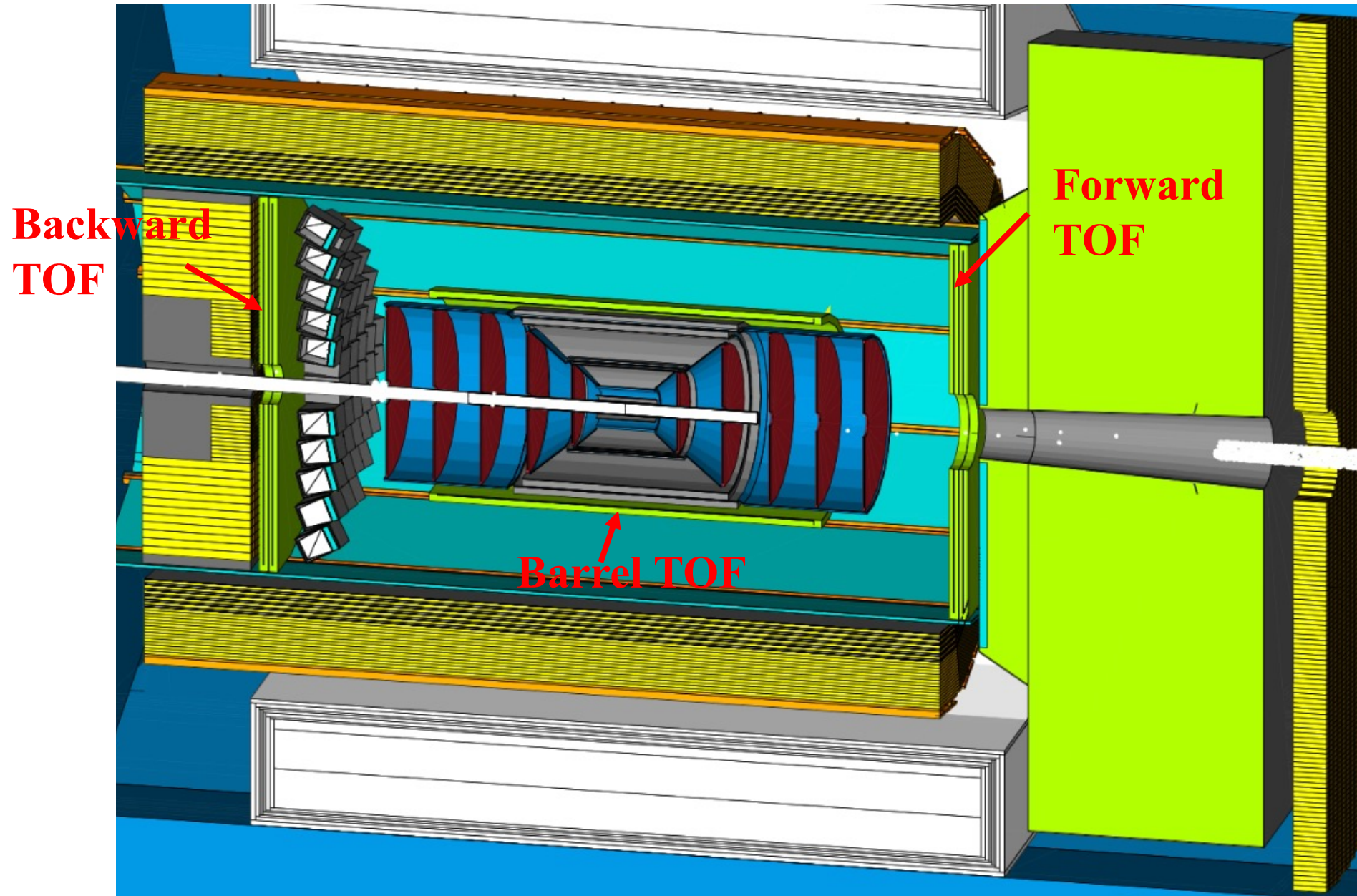
## **Backward TOF**

Double layer with 25 ps resolution and 5% $X_0$  material budget per layer

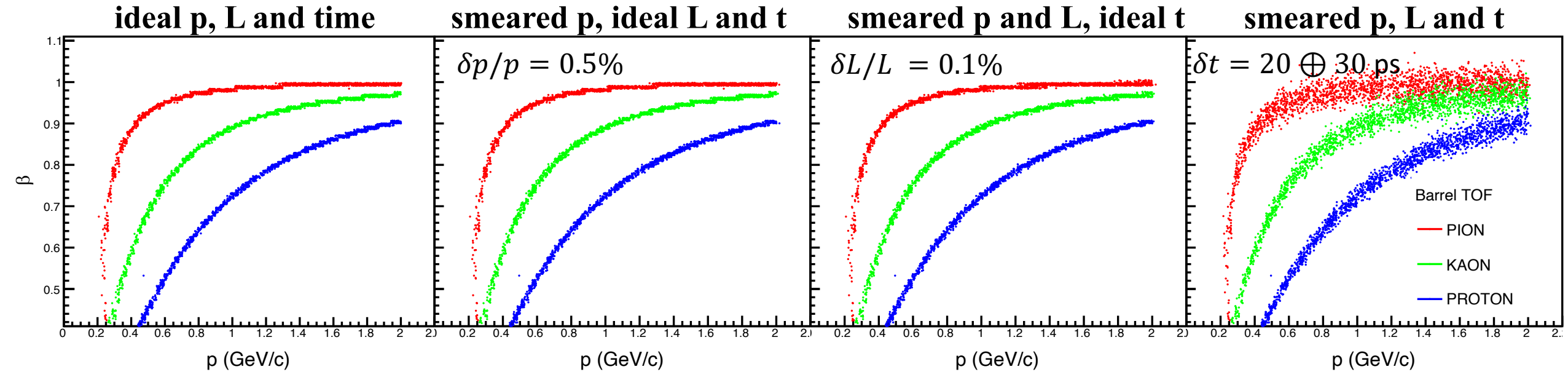
## **START Time**

20 ps resolution

# AC-LGAD TOF Detectors in ATHENA DD4HEP



# Barrel TOF ( $\eta=0$ )



## Status

- Run the ATHENA full detector simulation chain with DD4HEP/GEANT4
- Smear the truth level momentum and time according to the tracking/TOF resolution
- Path length calculated from the helix between IP and TOF hit with known momentum

## To-do

- Full track reconstruction to get the momentum and path length at the reco level.

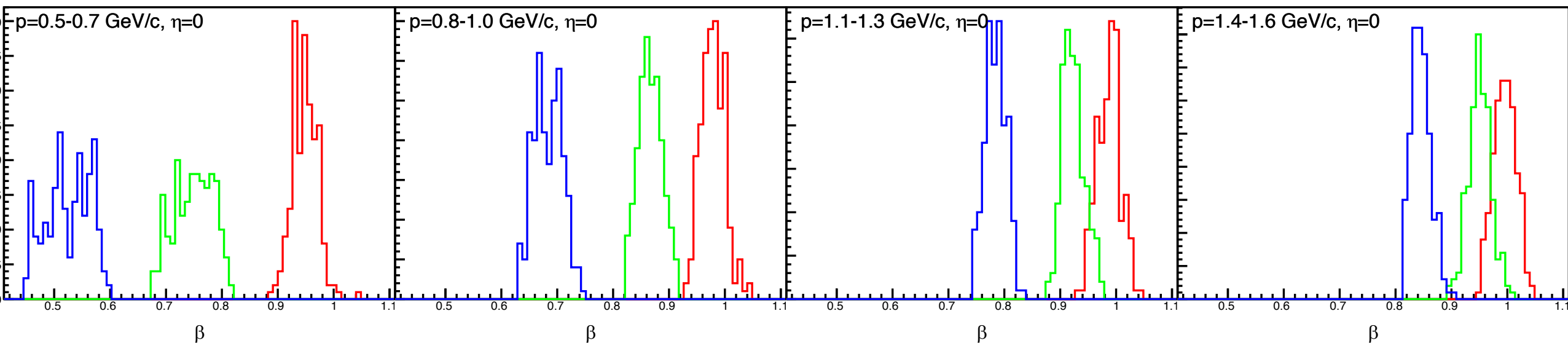
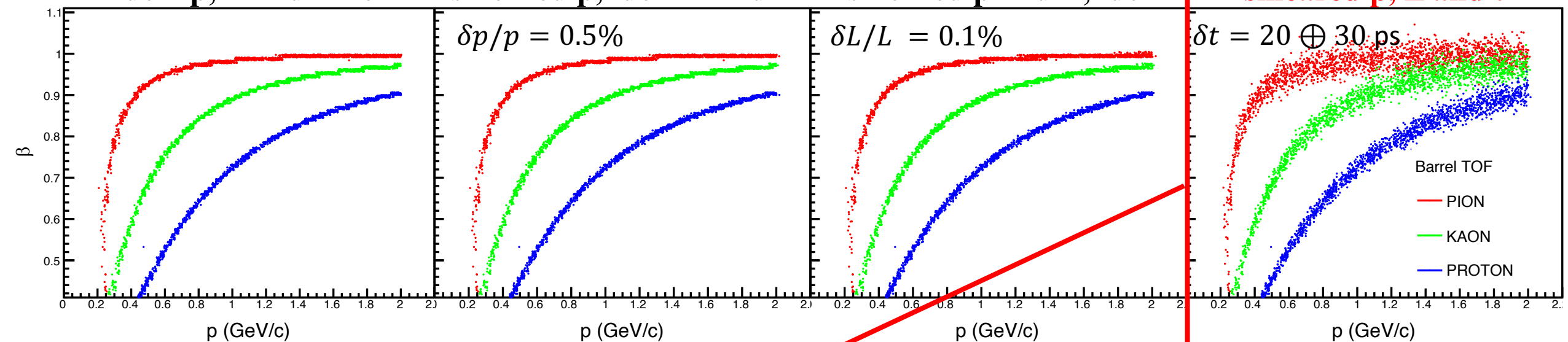
# Barrel TOF ( $\eta=0$ )

ideal p, L and time

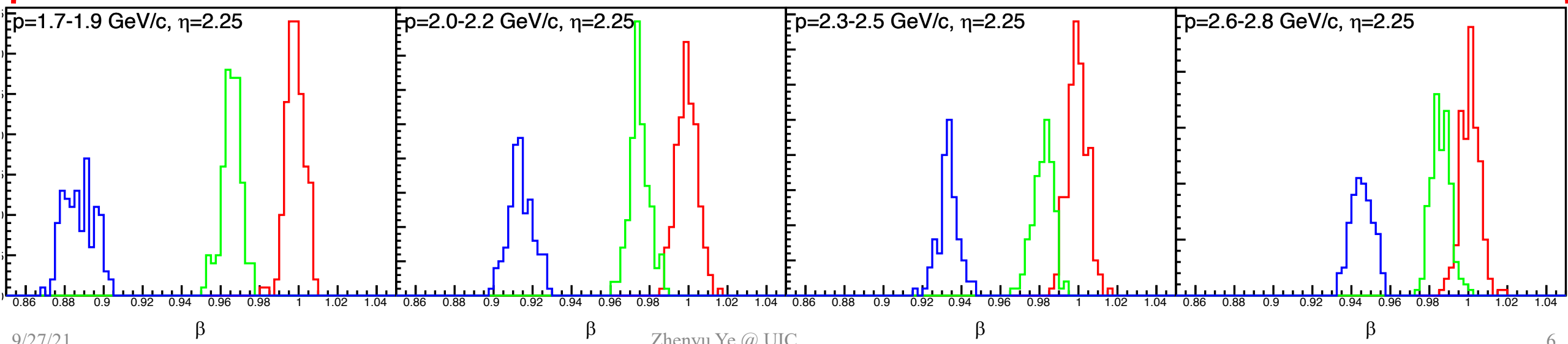
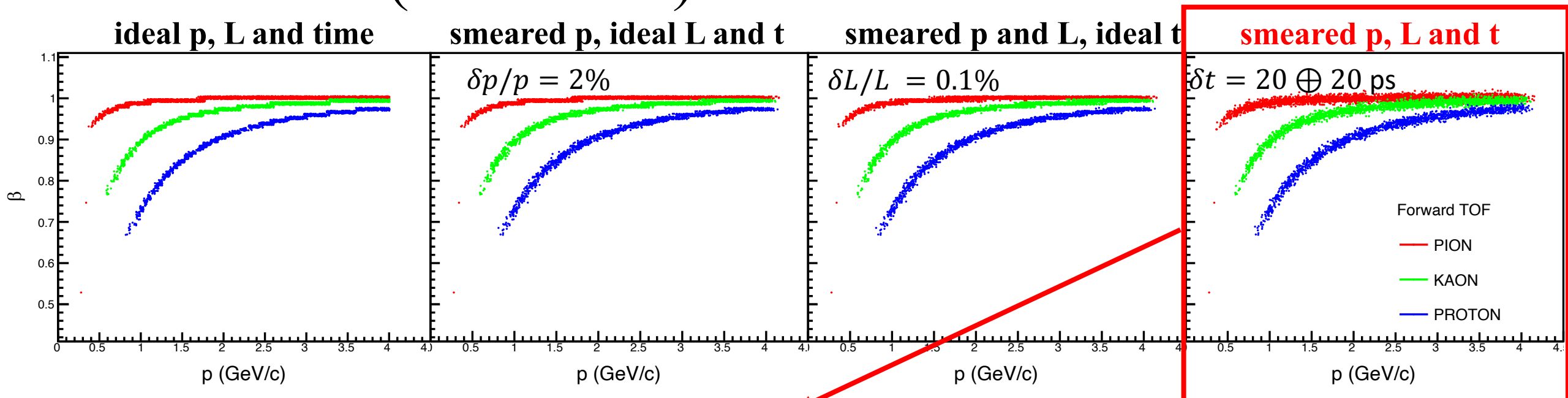
smearred p, ideal L and t

smearred p and L, ideal t

smearred p, L and t



# Forward TOF ( $\eta=+2.25$ )



# Backward TOF ( $\eta=-2.25$ )

