

Timing PID: β vs p

Datasets with solenoid at 1200 A:

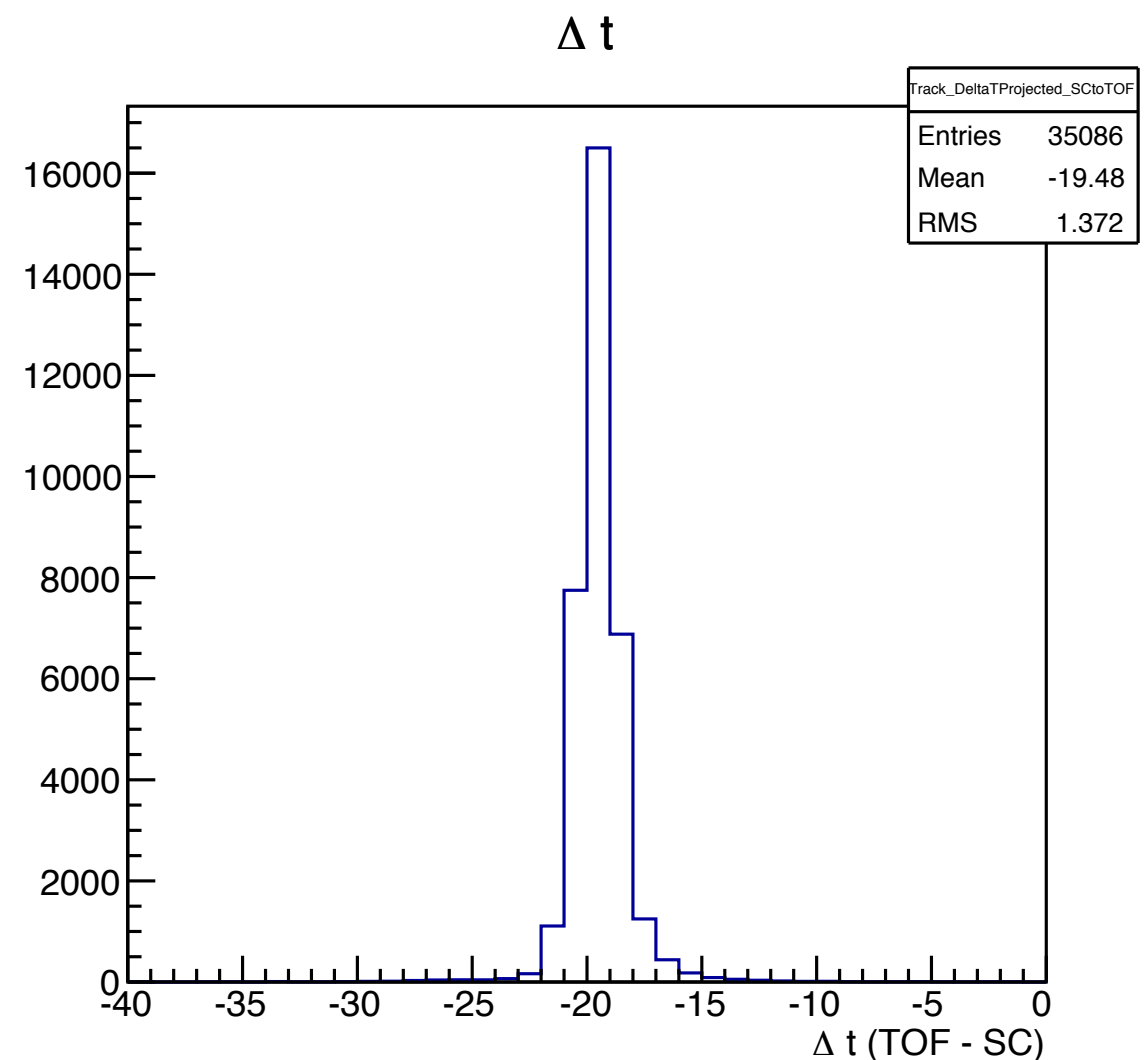
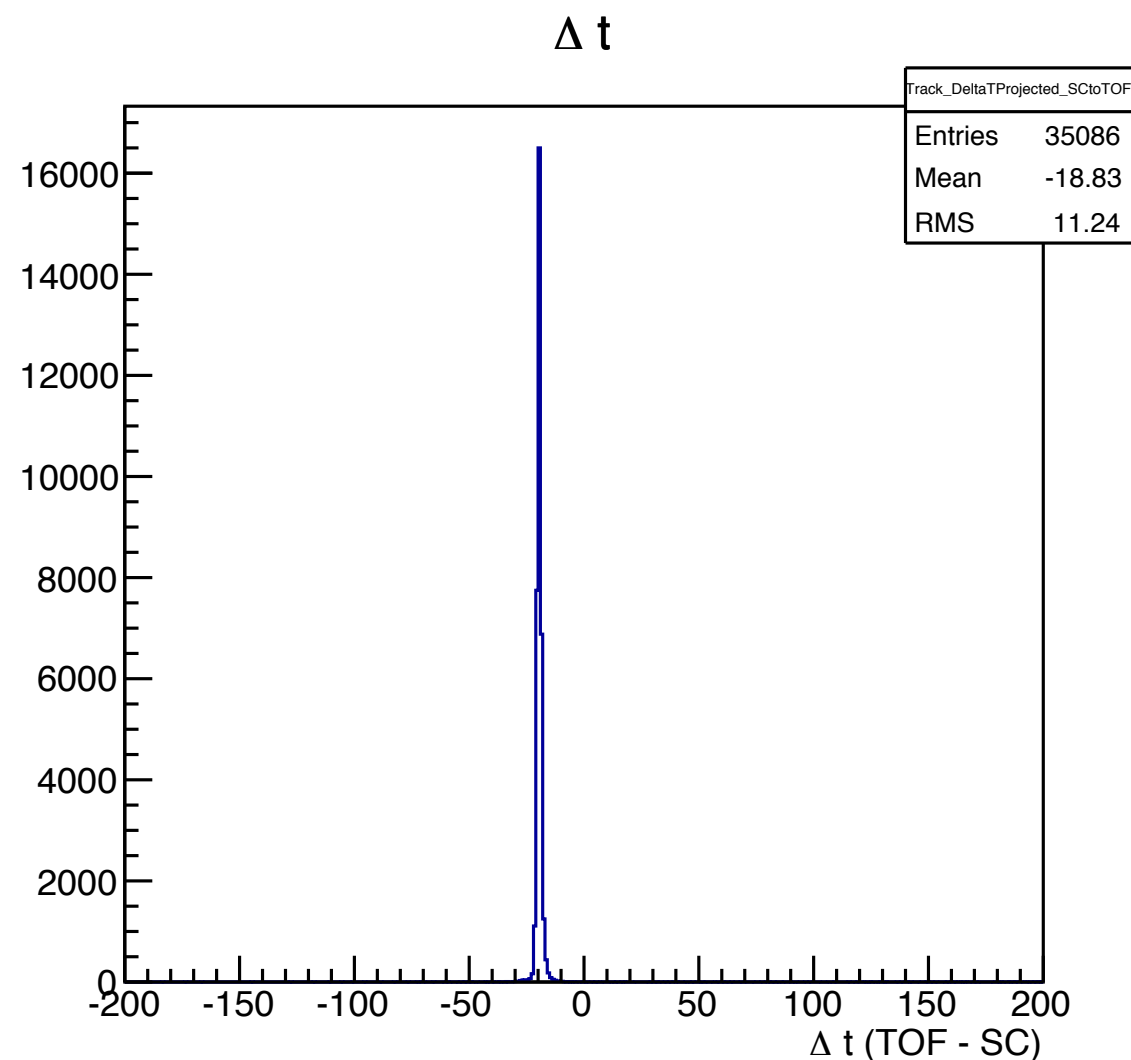
- ~10 M events with **FCAL trigger**: runs 1505-1520
- ~8.5 M events with **BCAL trigger**: runs 1553-1592

Track Selection

- Use DTrackTimeBased tracks with only the pion mass hypothesis and require:
 - Tracking FOM $> 10^{-4}$
 - POCA to beamline: $50 < Z < 80$ cm

Time offset between SC and TOF

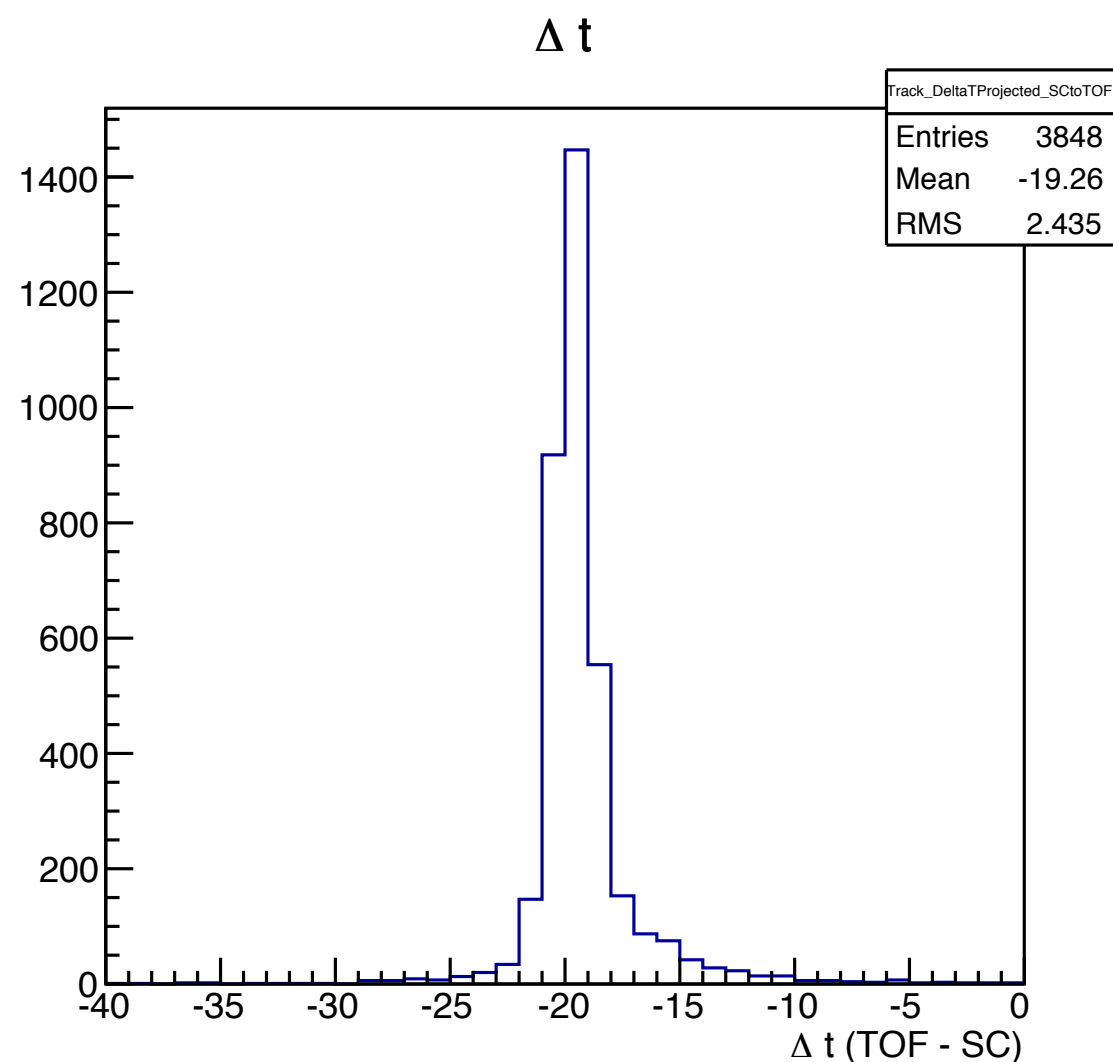
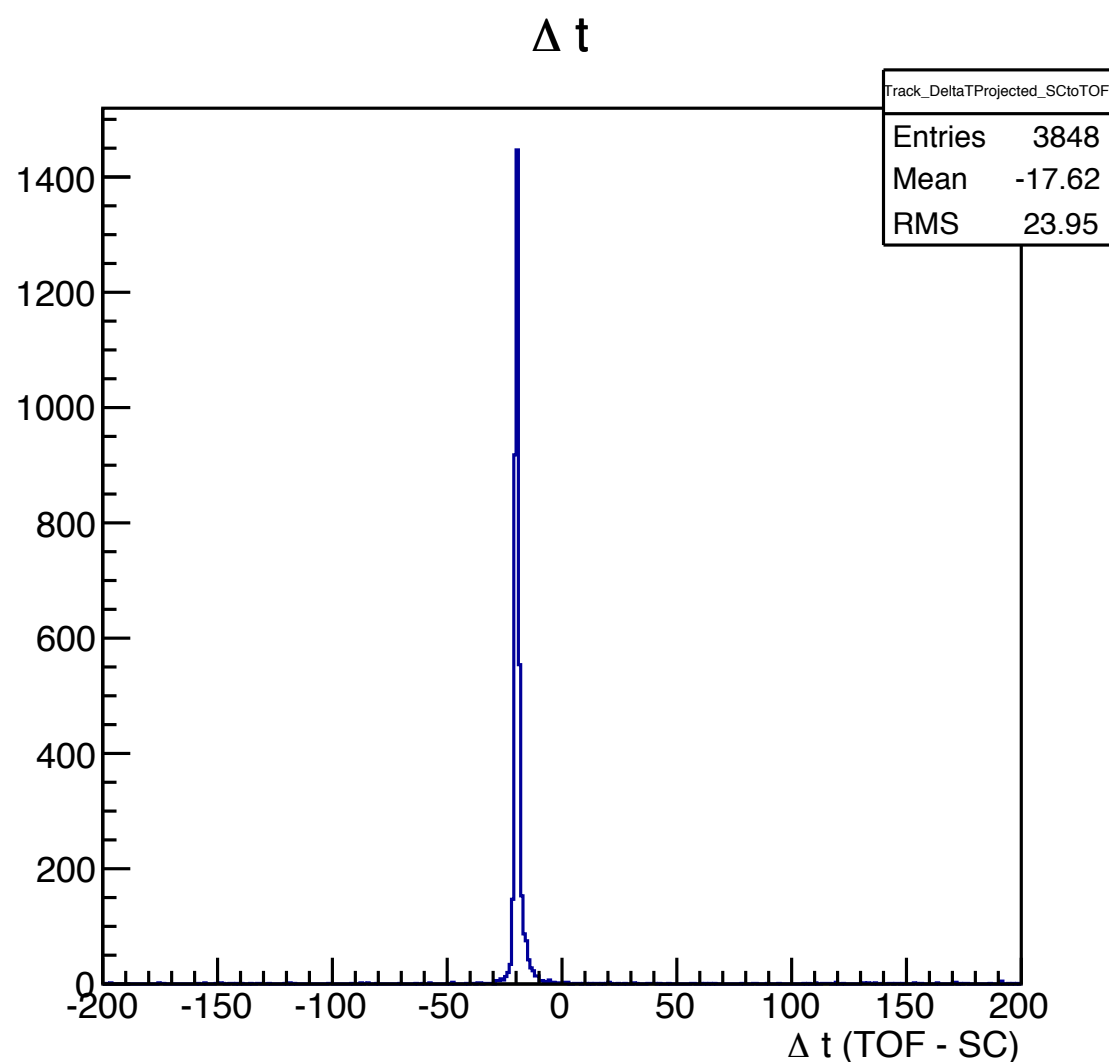
- Using only fADC hits (no TDC times)
- Require track has matched hit in SC and TOF
- Use pathlength to determine time of SC and TOF hit propagated to the target
- Calculate Δt (TOF - SC) at target, which should be 0 if timing is synced



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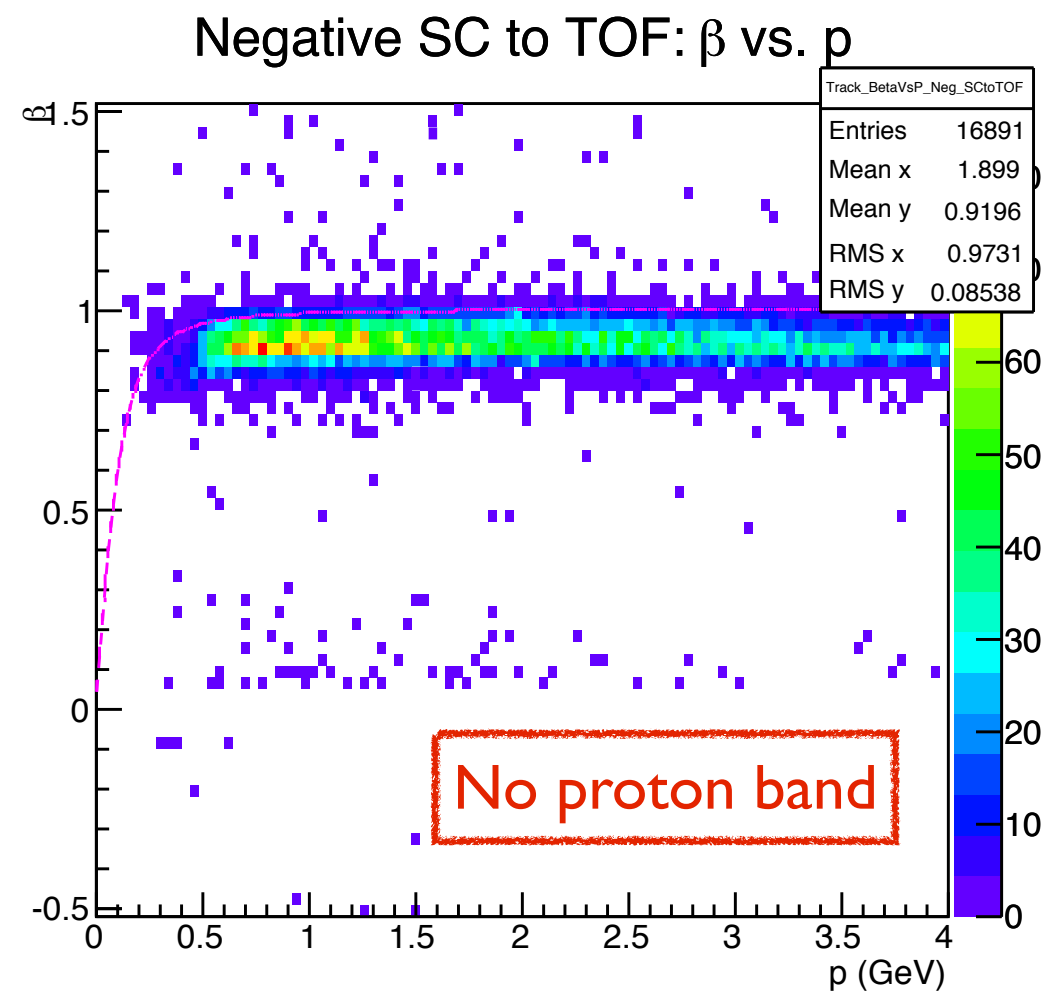
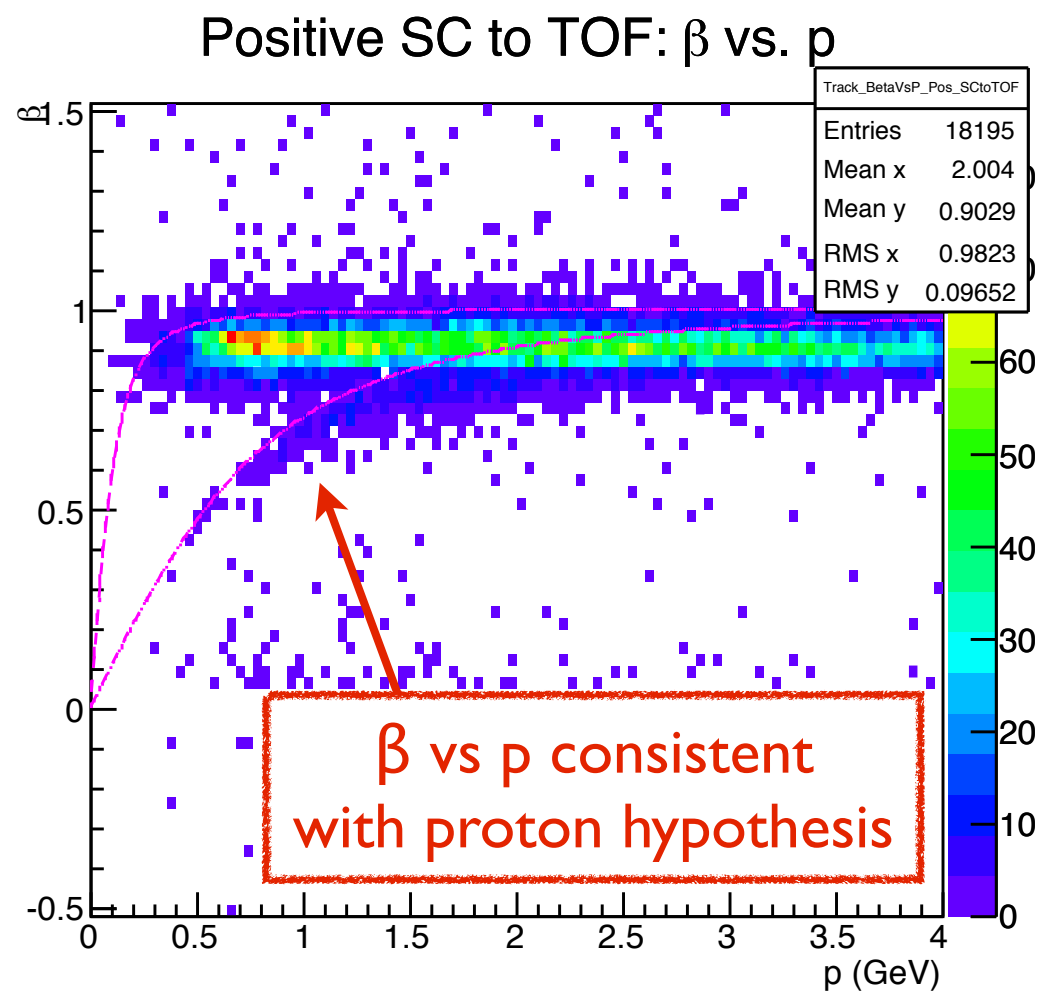


BCAL trigger: runs 1553-1592

Timing PID with SC-TOF coincidence

- After adjusting timing offset between SC and TOF, use SC as t_0
- β is calculated with the SC and TOF times and pathlength between SC and TOF

$$\beta = \frac{\text{pathlength}(TOF - SC)}{c \cdot (t_{TOF} - t_{SC})}$$

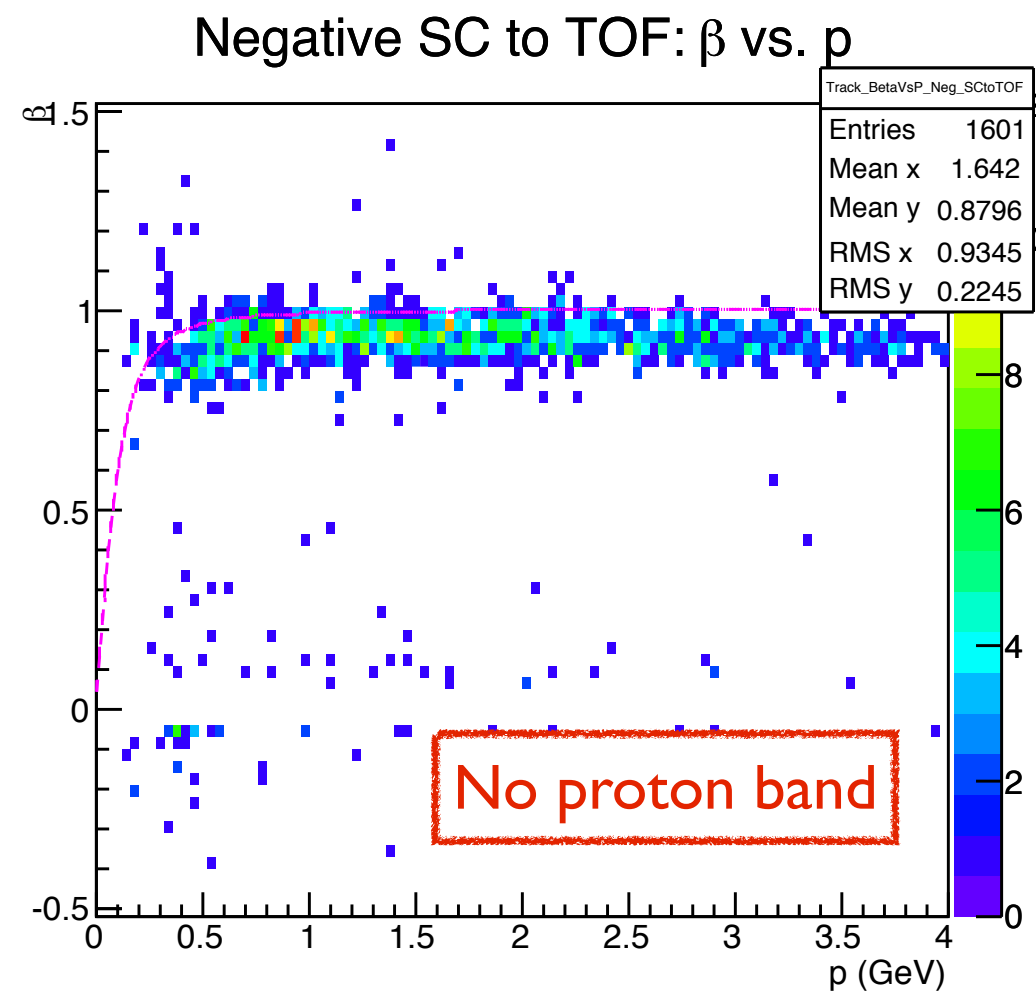
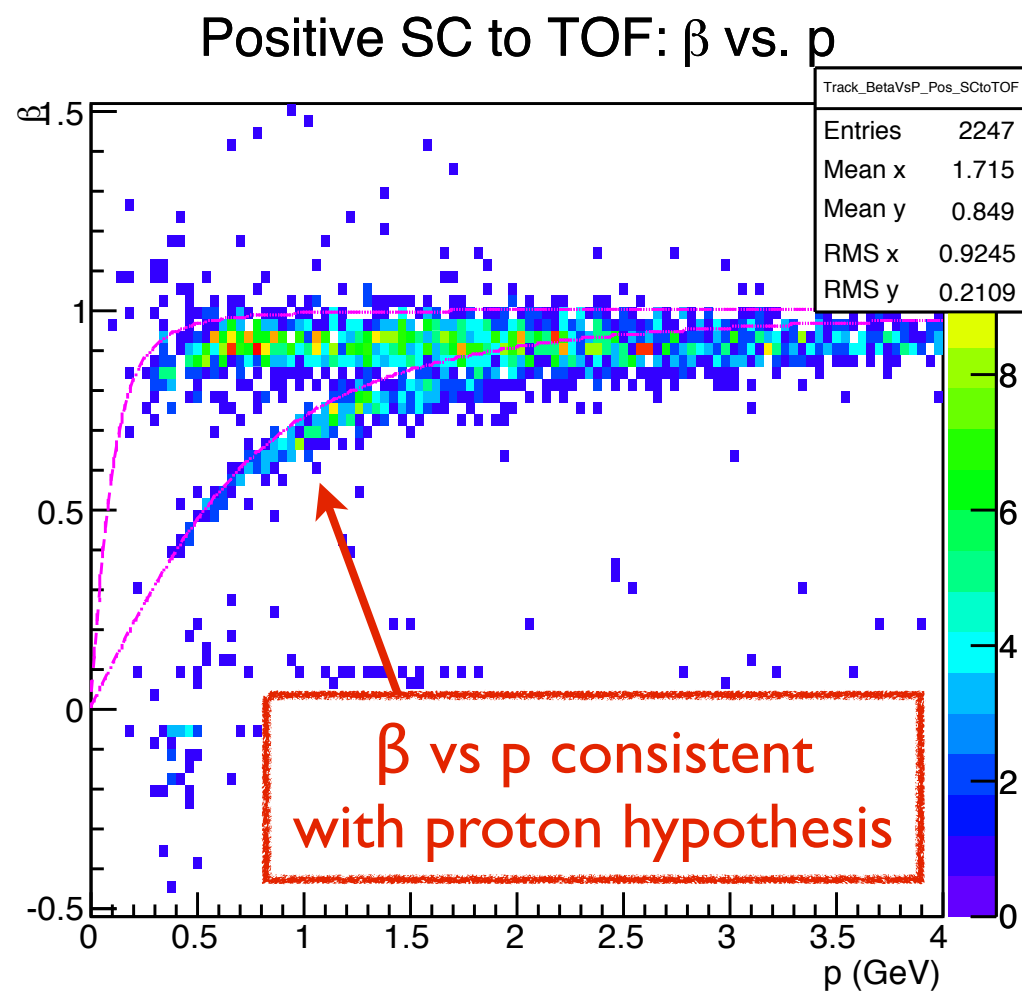


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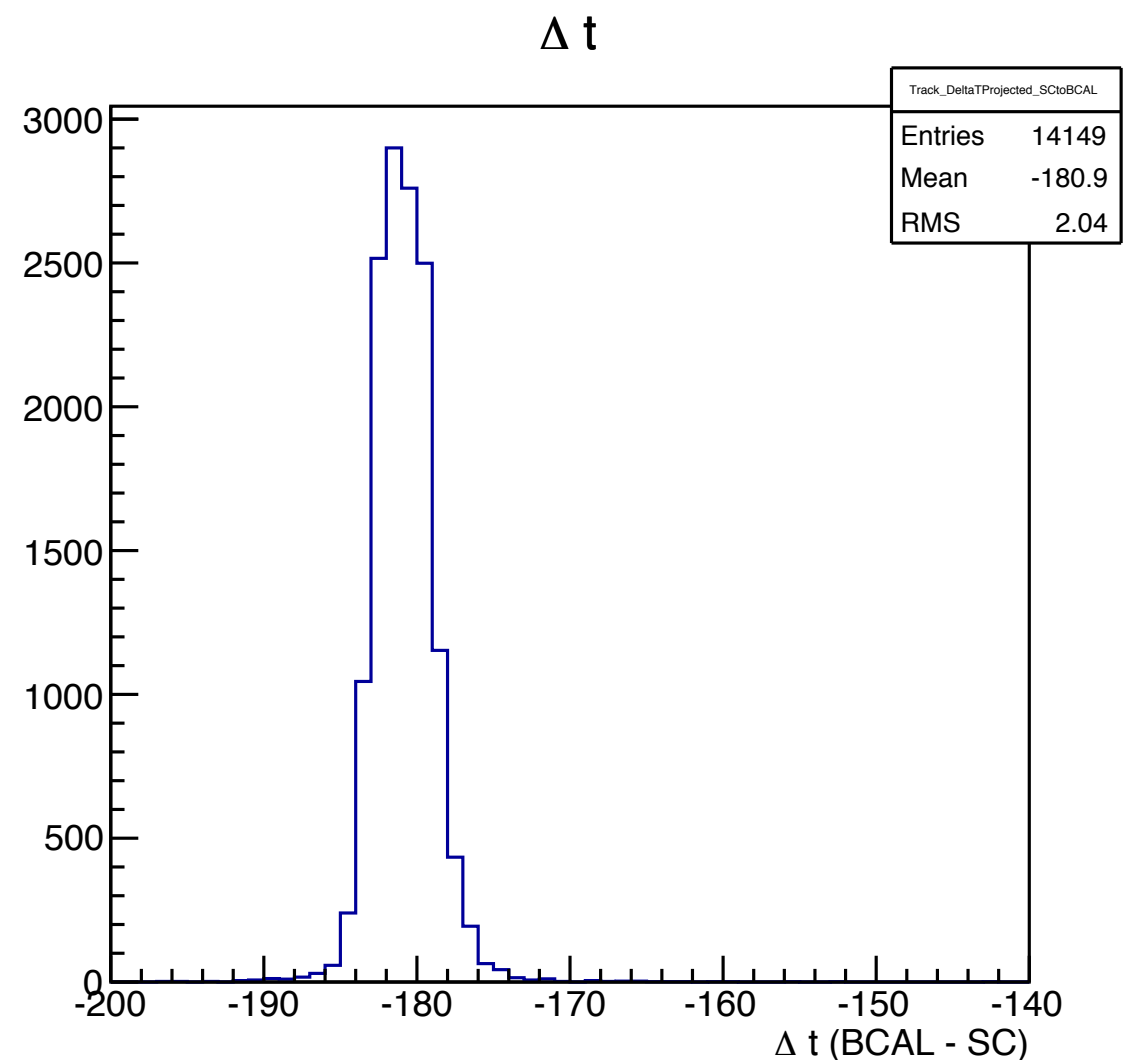
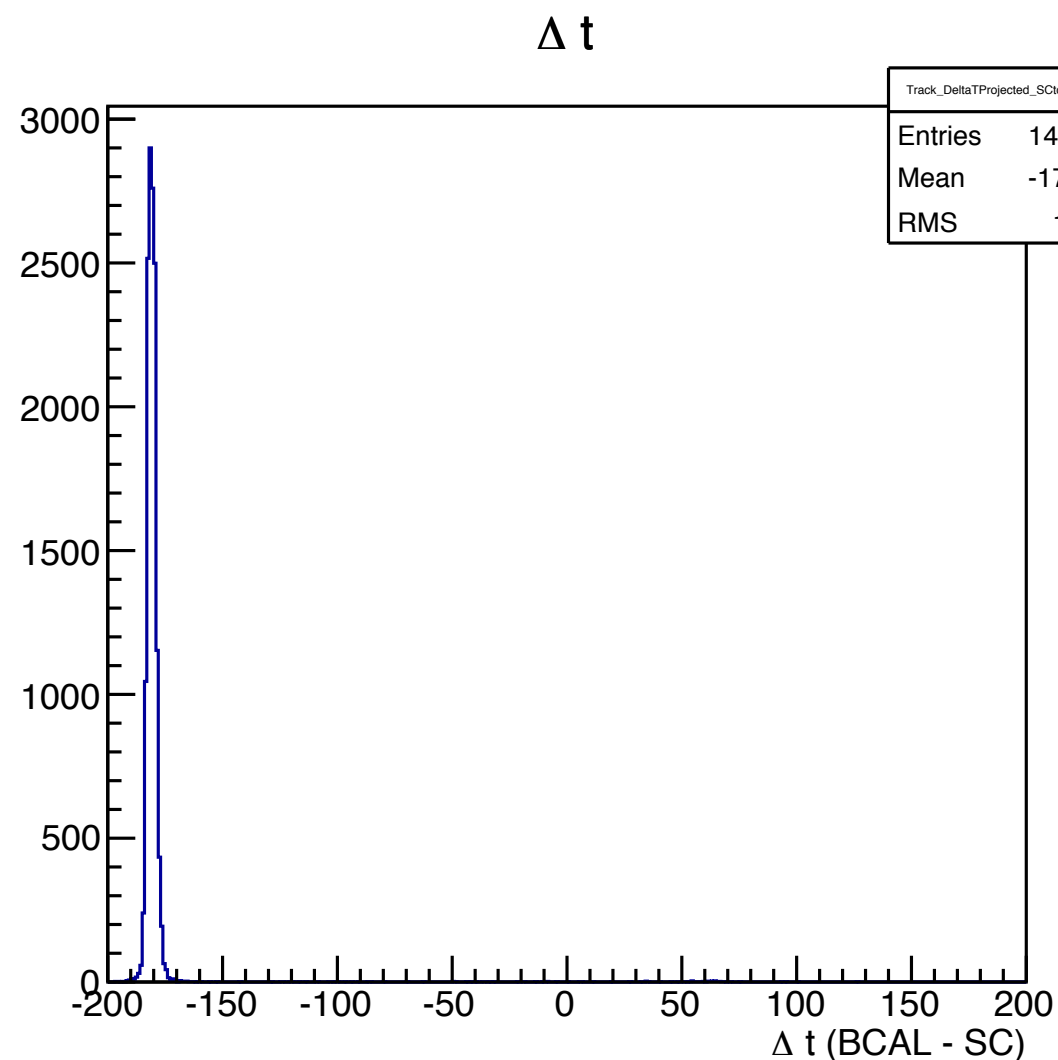
$$\beta = \frac{\text{pathlength}(TOF - SC)}{c \cdot (t_{TOF} - t_{SC})}$$



BCAL trigger: runs 1553-1592

Time offset between SC and BCAL

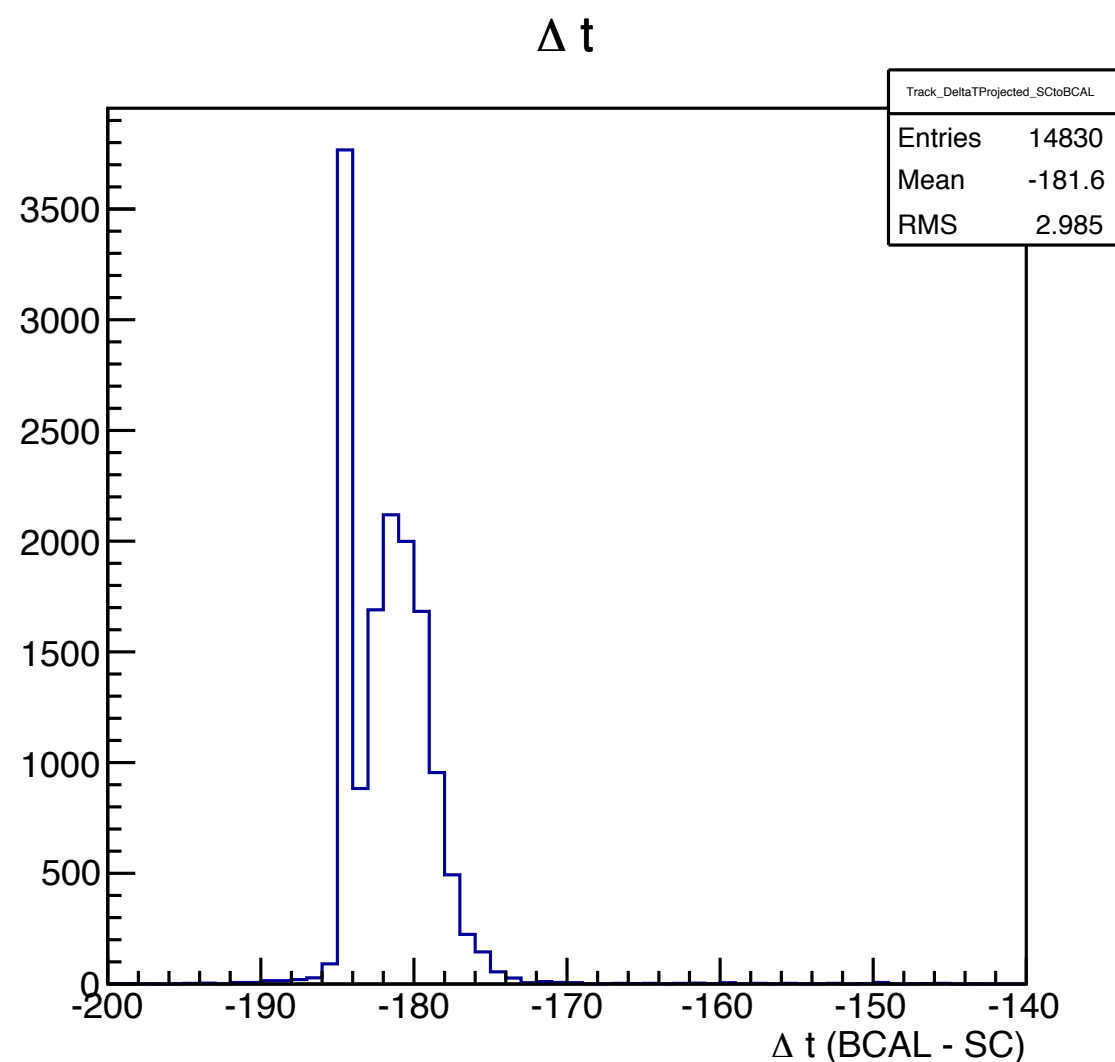
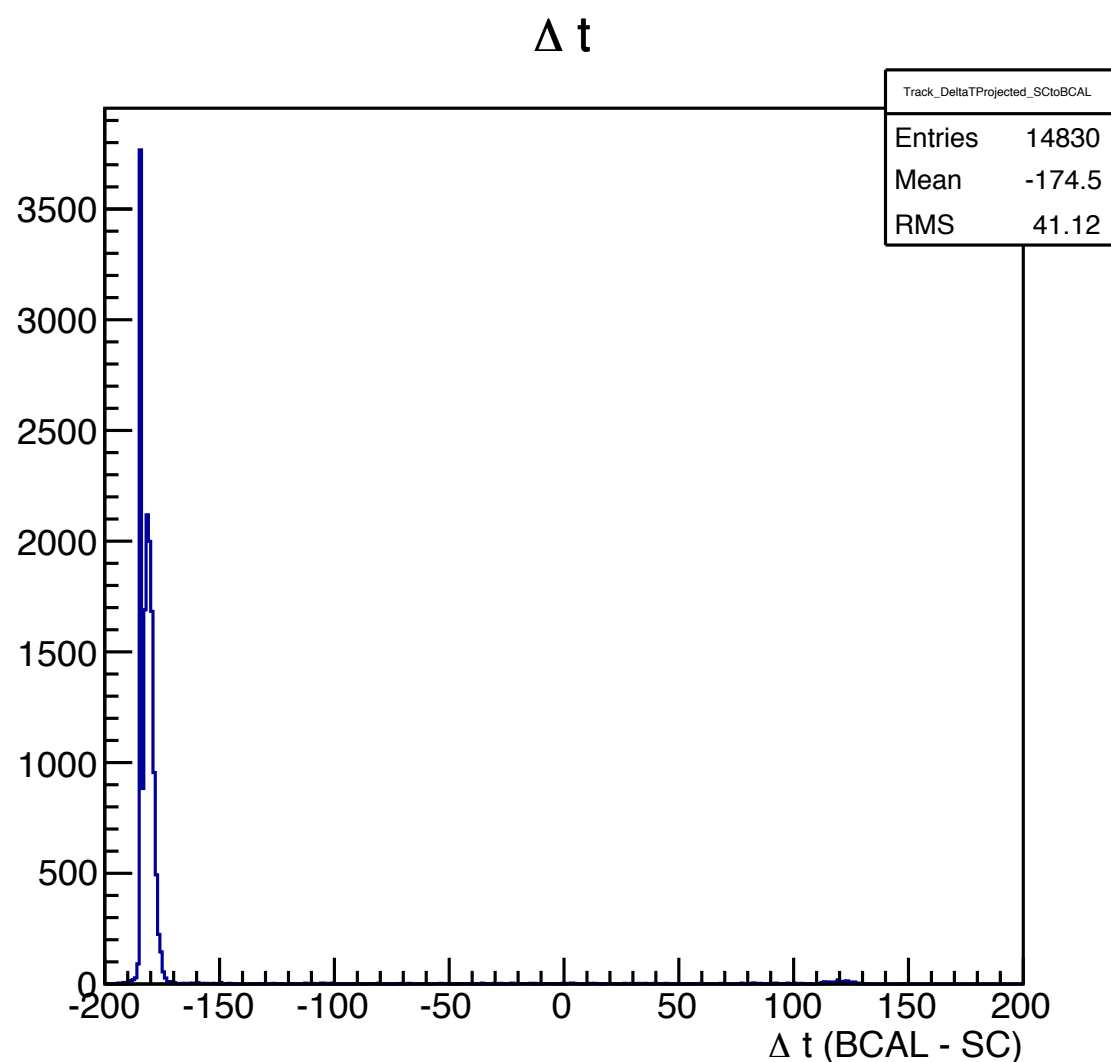
- Using only fADC hits (no TDC times)
- Require track has matched hit in SC and BCAL
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- Calculate Δt (BCAL - SC) at target, which should be 0 if timing is synced



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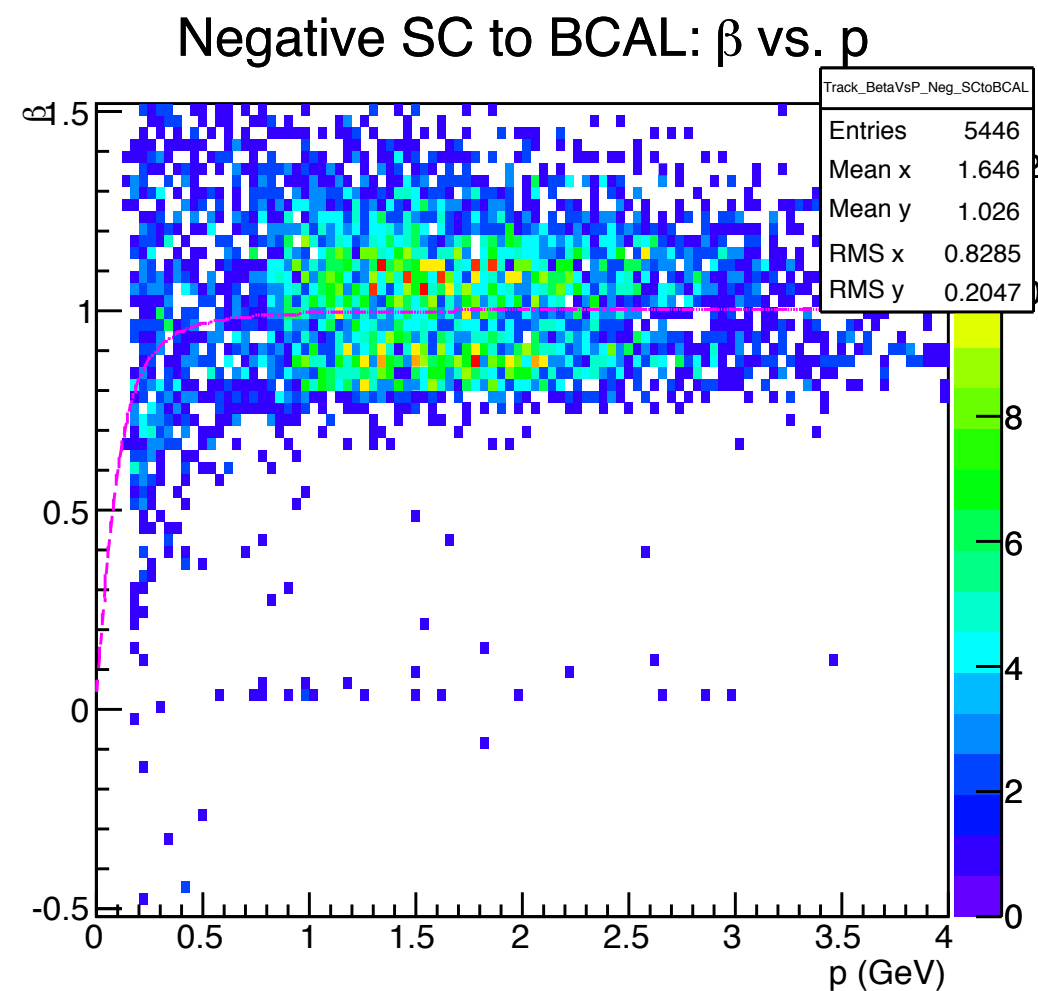
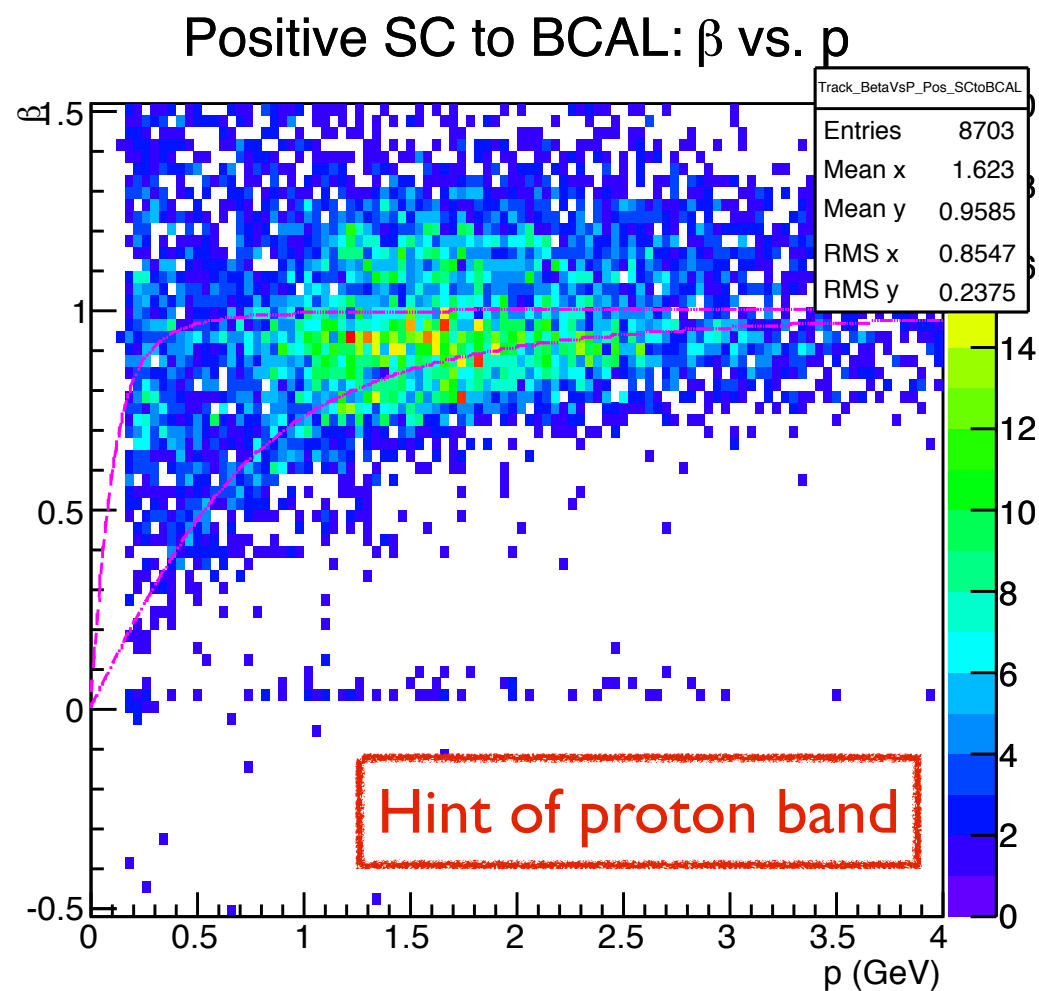


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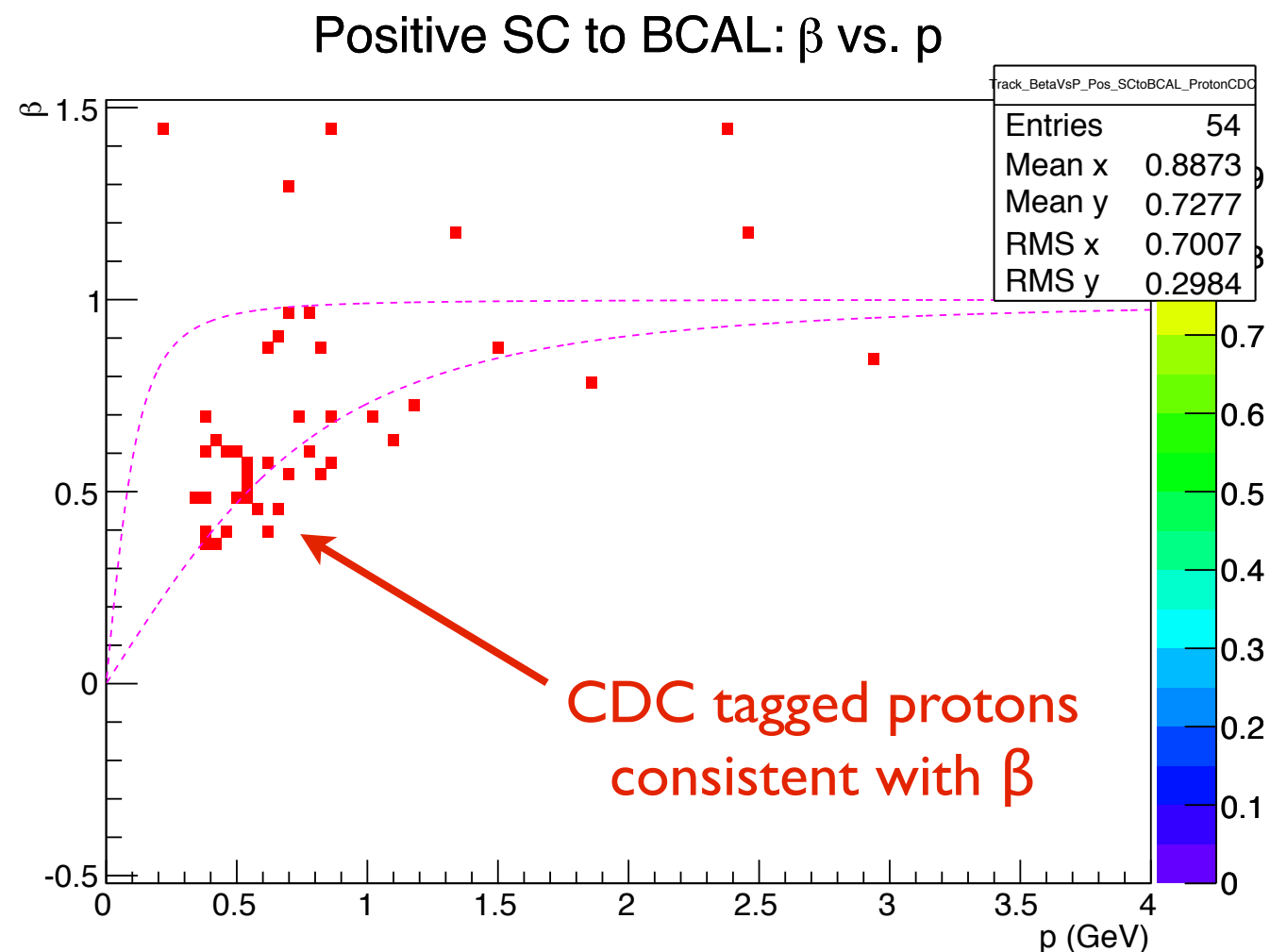
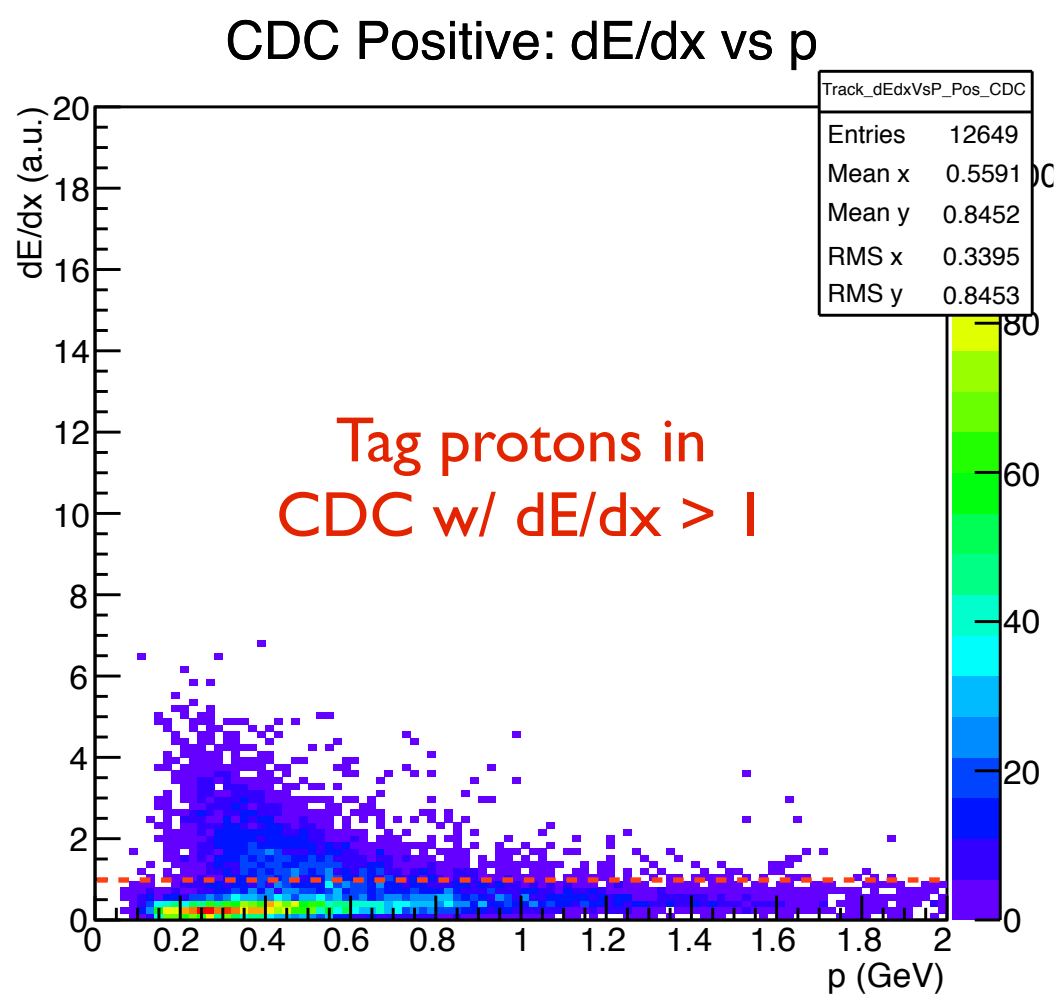


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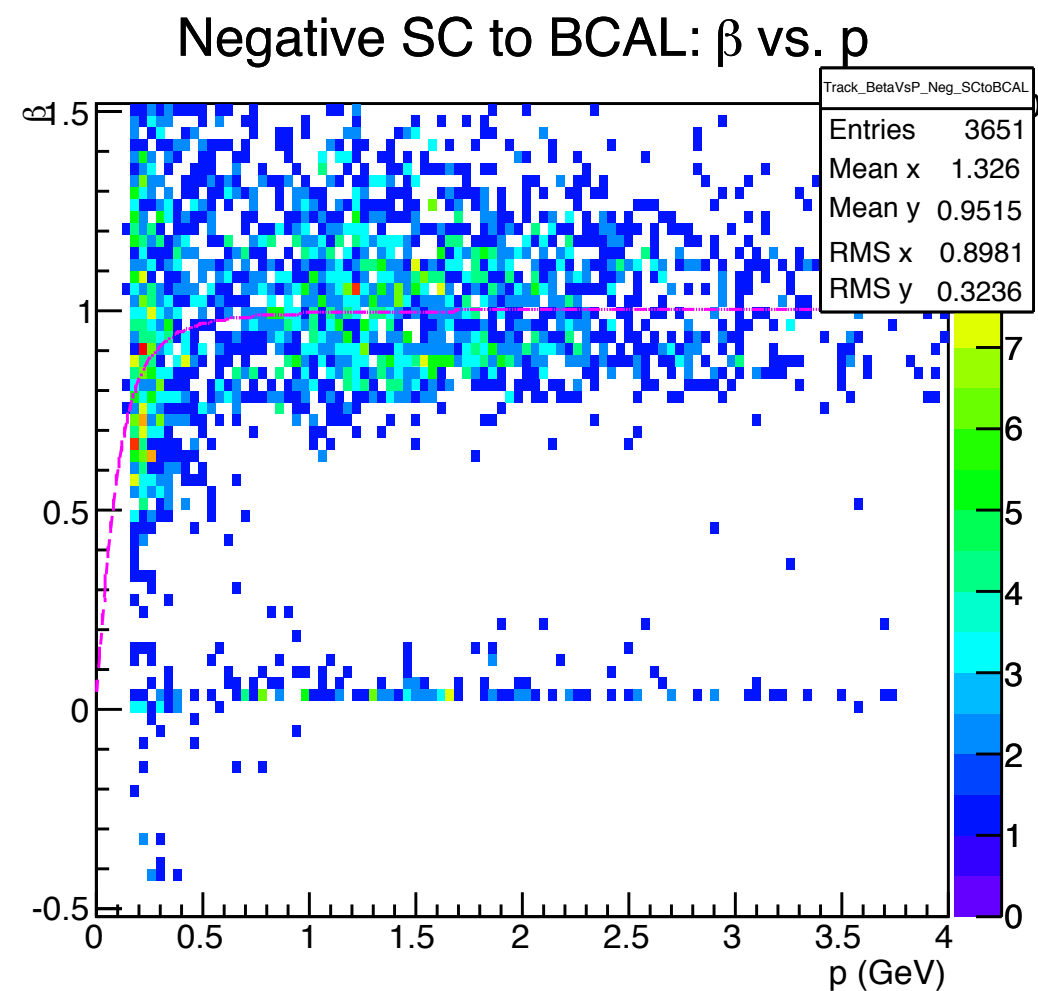
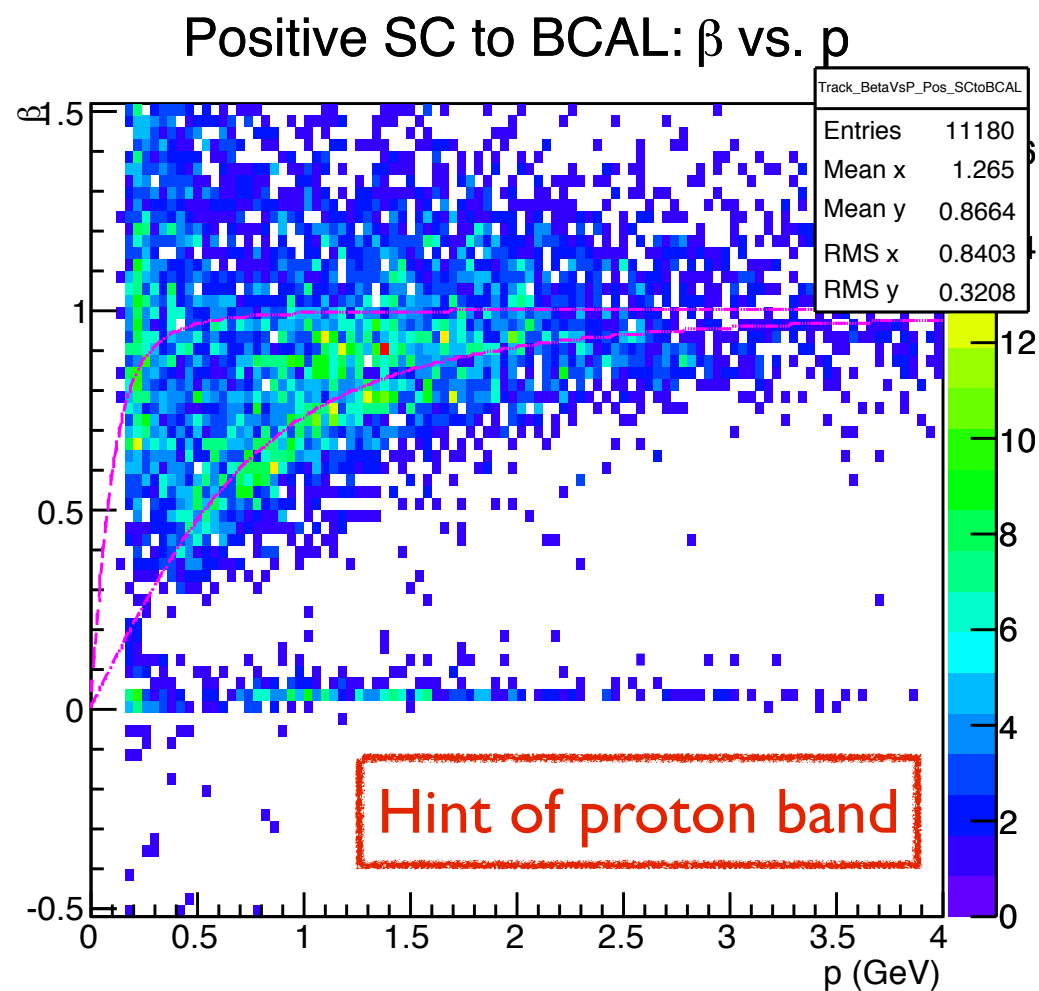


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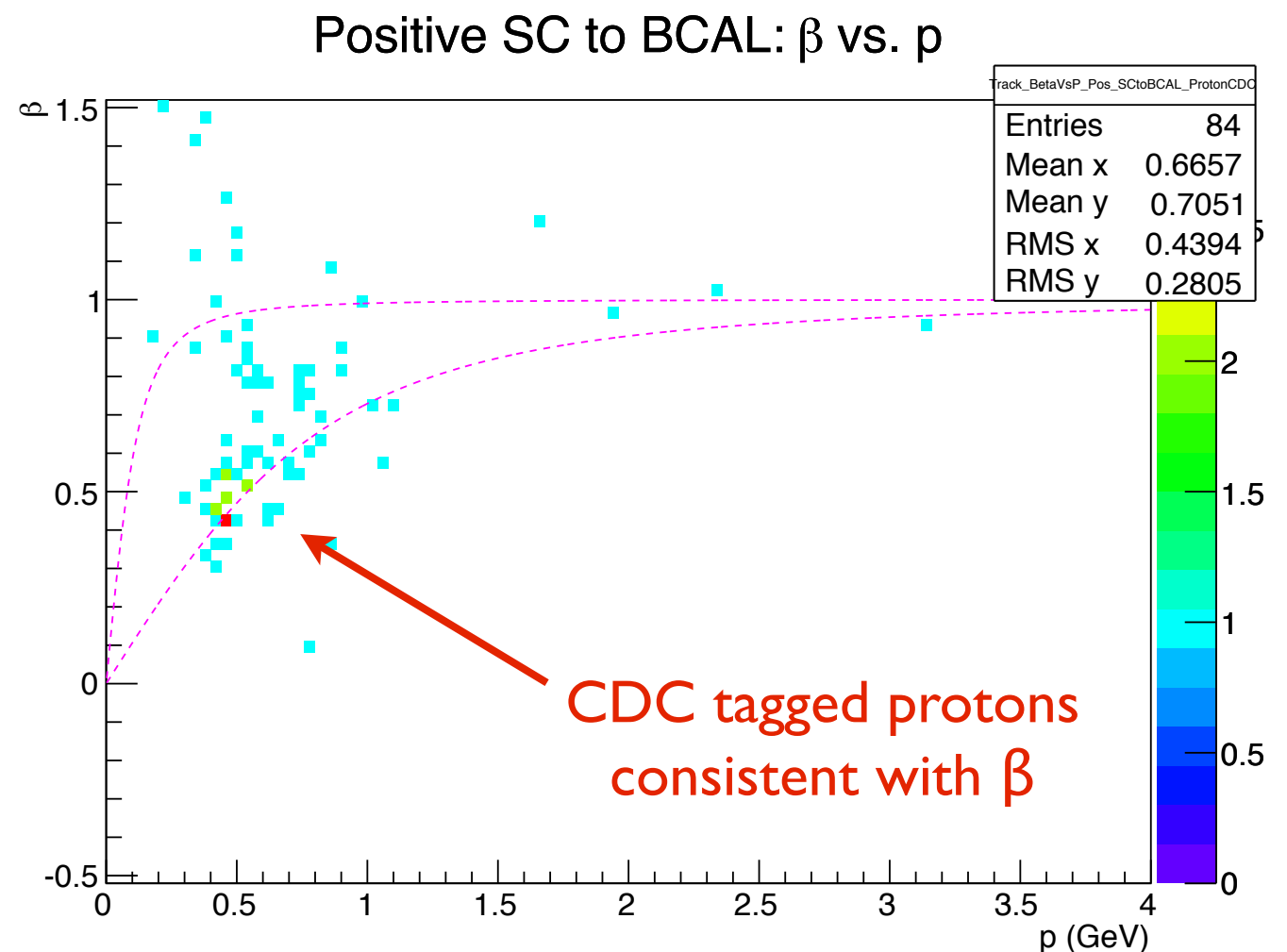
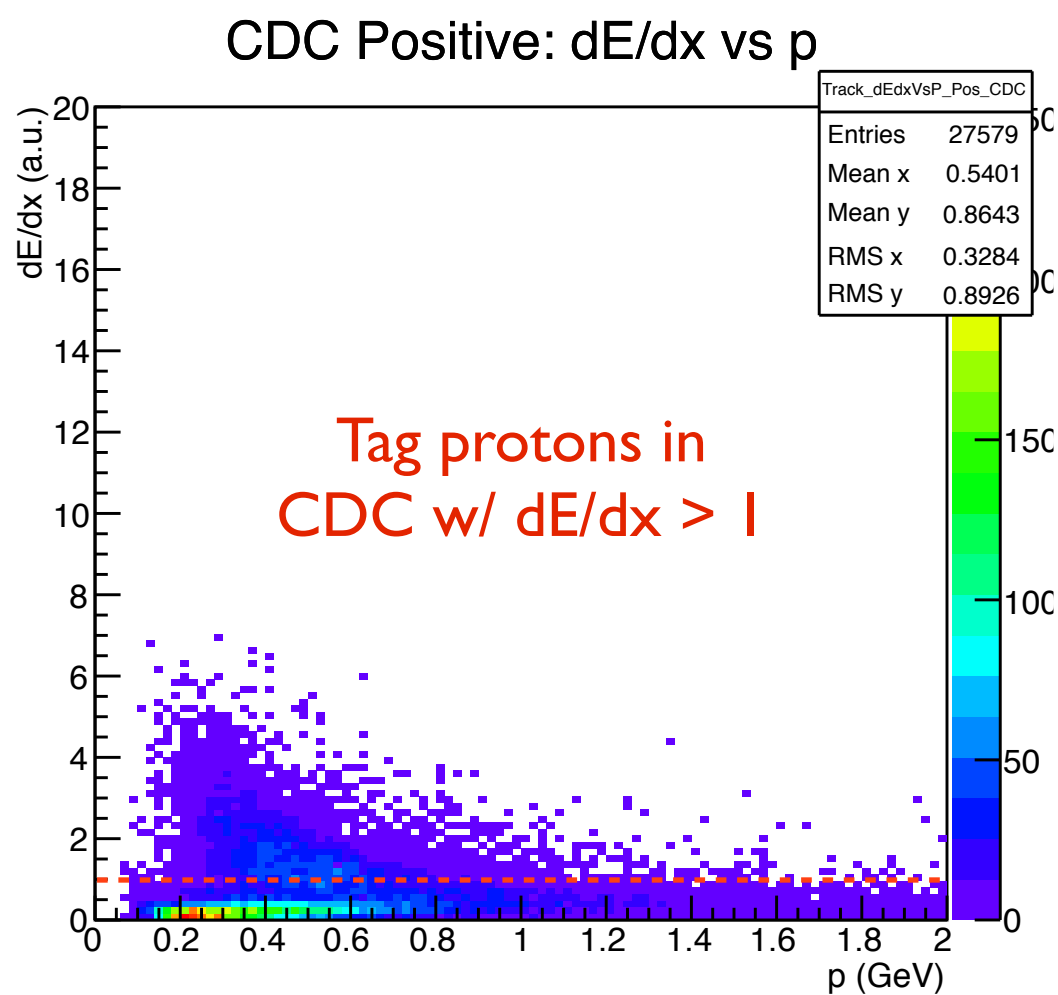


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