Using the Particle Gun to Diagnose Hall D Tracking

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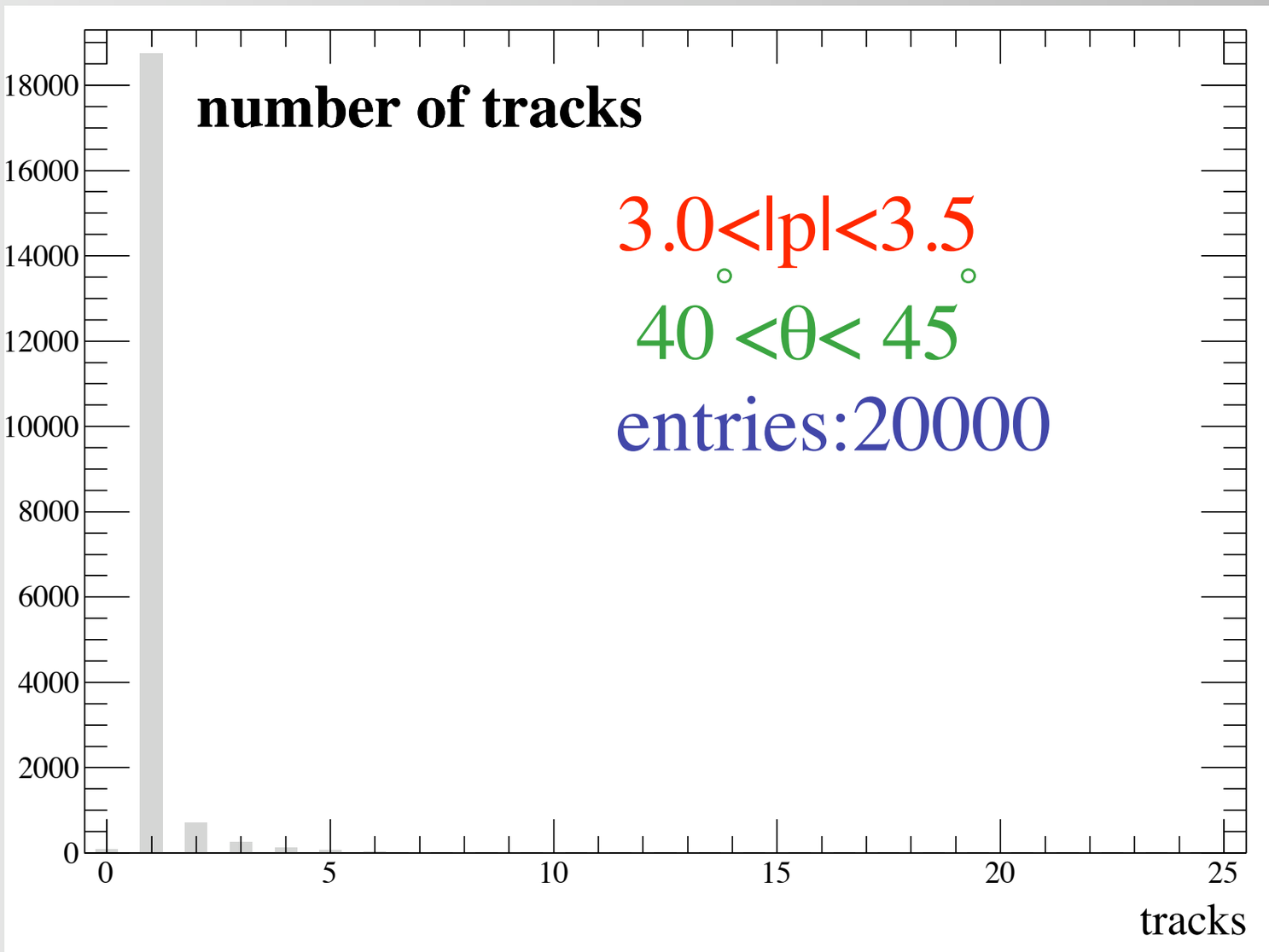
Motivation

- various studies done in tracking by analyzing
  - $p\ \pi^+\ \pi^-$
  - $p\ K^+\ K^-$
- $|p|$ mismatch by PID, usage of t_0, ΔTOF etc.
- step back and analyze individual tracks using [particle gun]

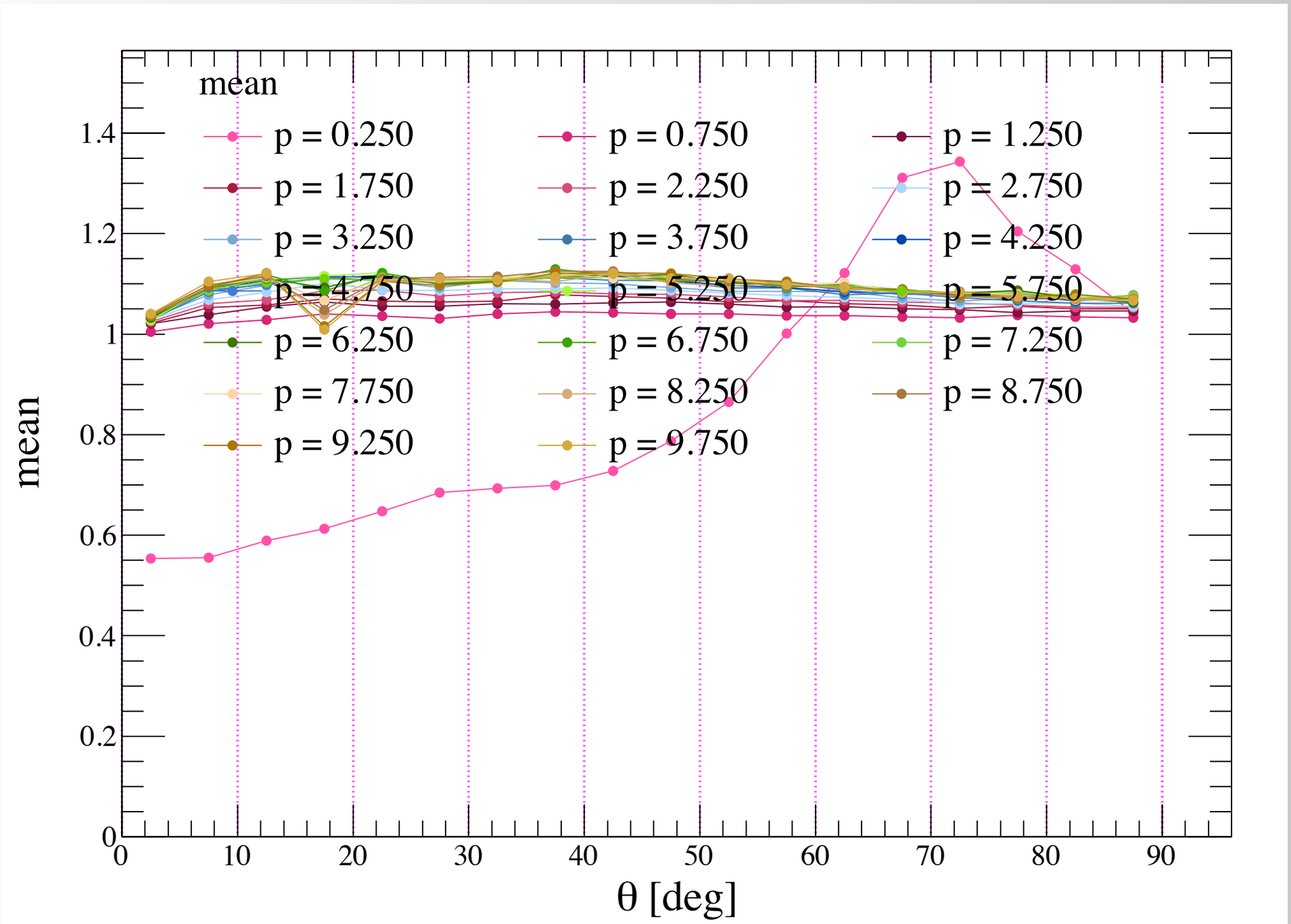
Particle Gun Events

- 20k events generated each in bins of |p|, θ
- 0<|p|<10 GeV/c, 0.5 GeV/c bins
- 0°< θ <90°, 5° bins
- π^+ events only
- get mean, standard deviation for each bin



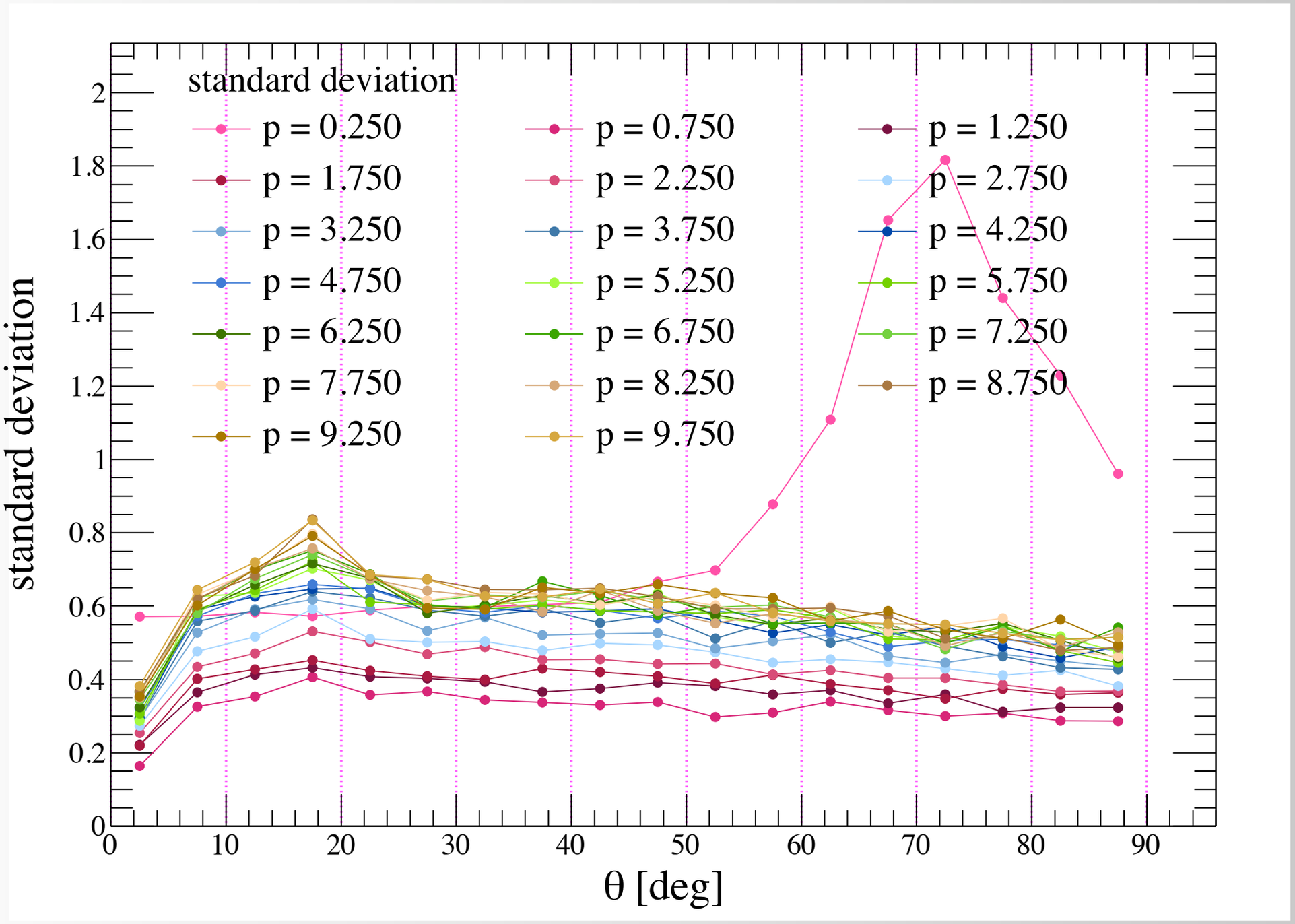
Number of Tracks

- mean number of tracks by bin

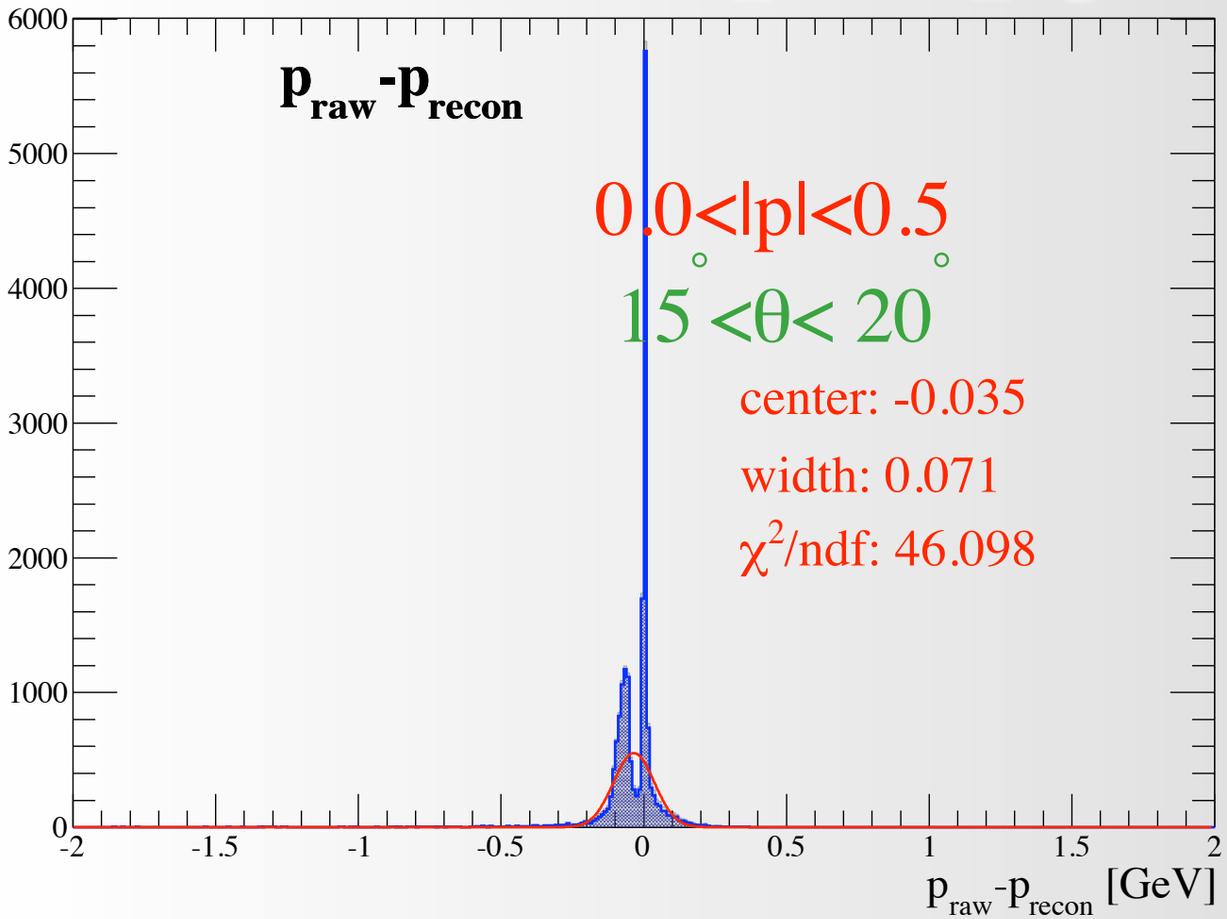


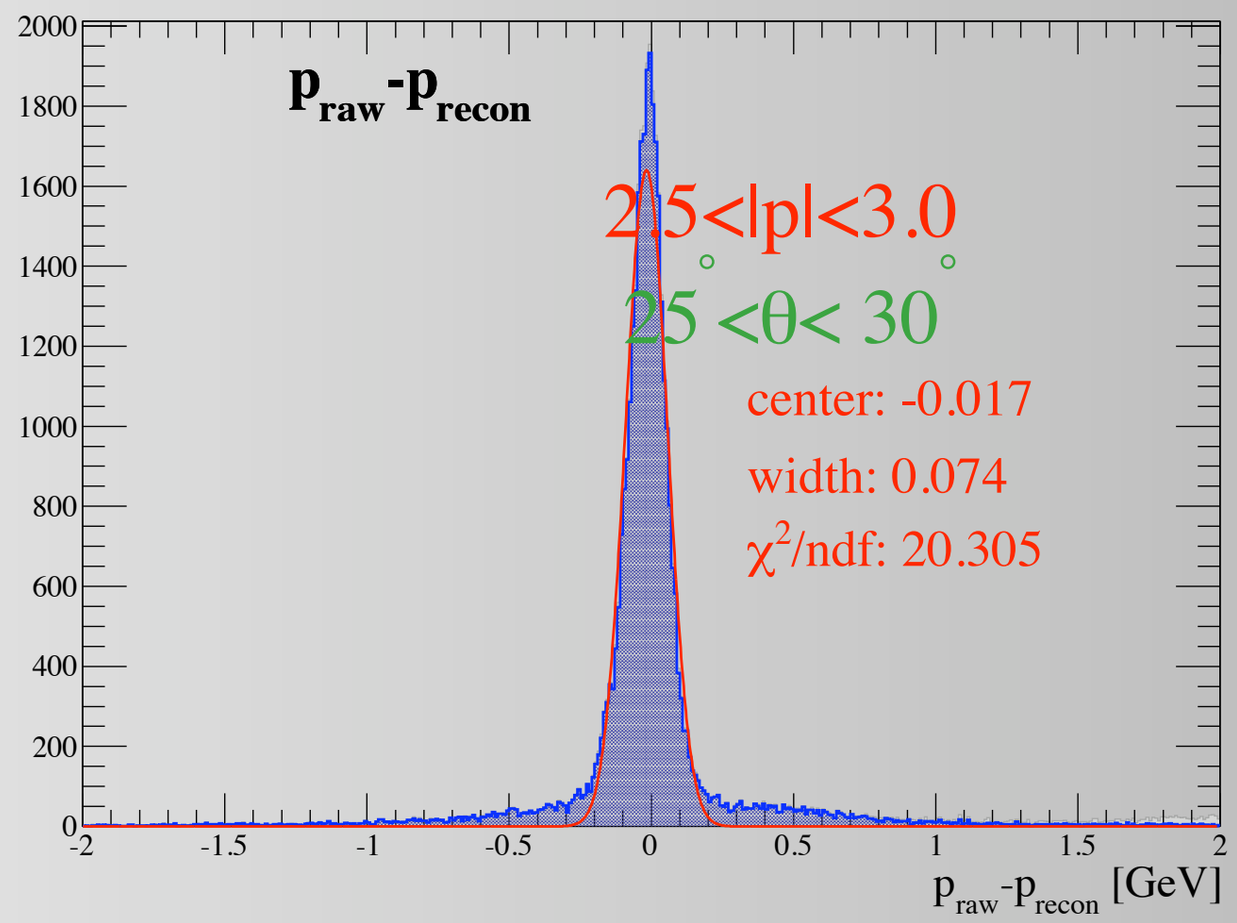
Number of Tracks

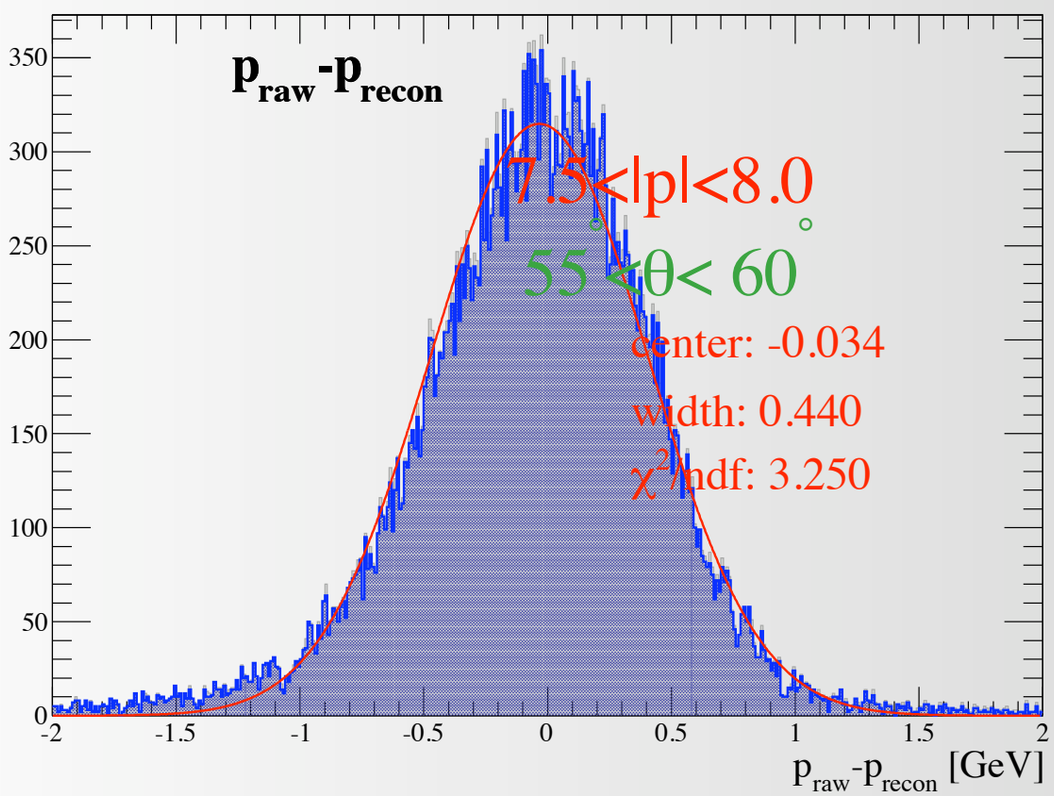
- standard deviation of tracks by bin



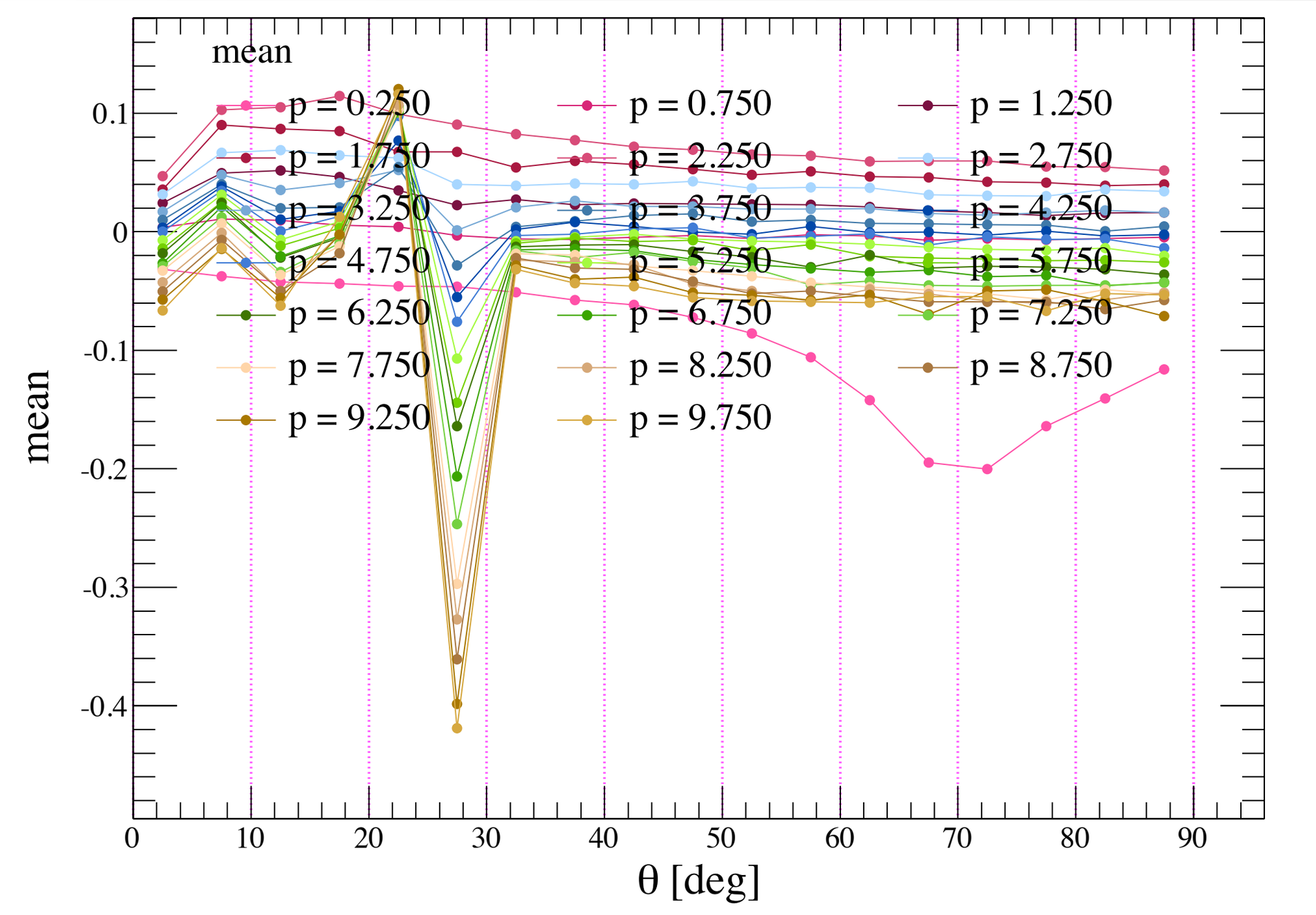
$\Delta p = p_{gen} - p_{recon}$ (1/3)



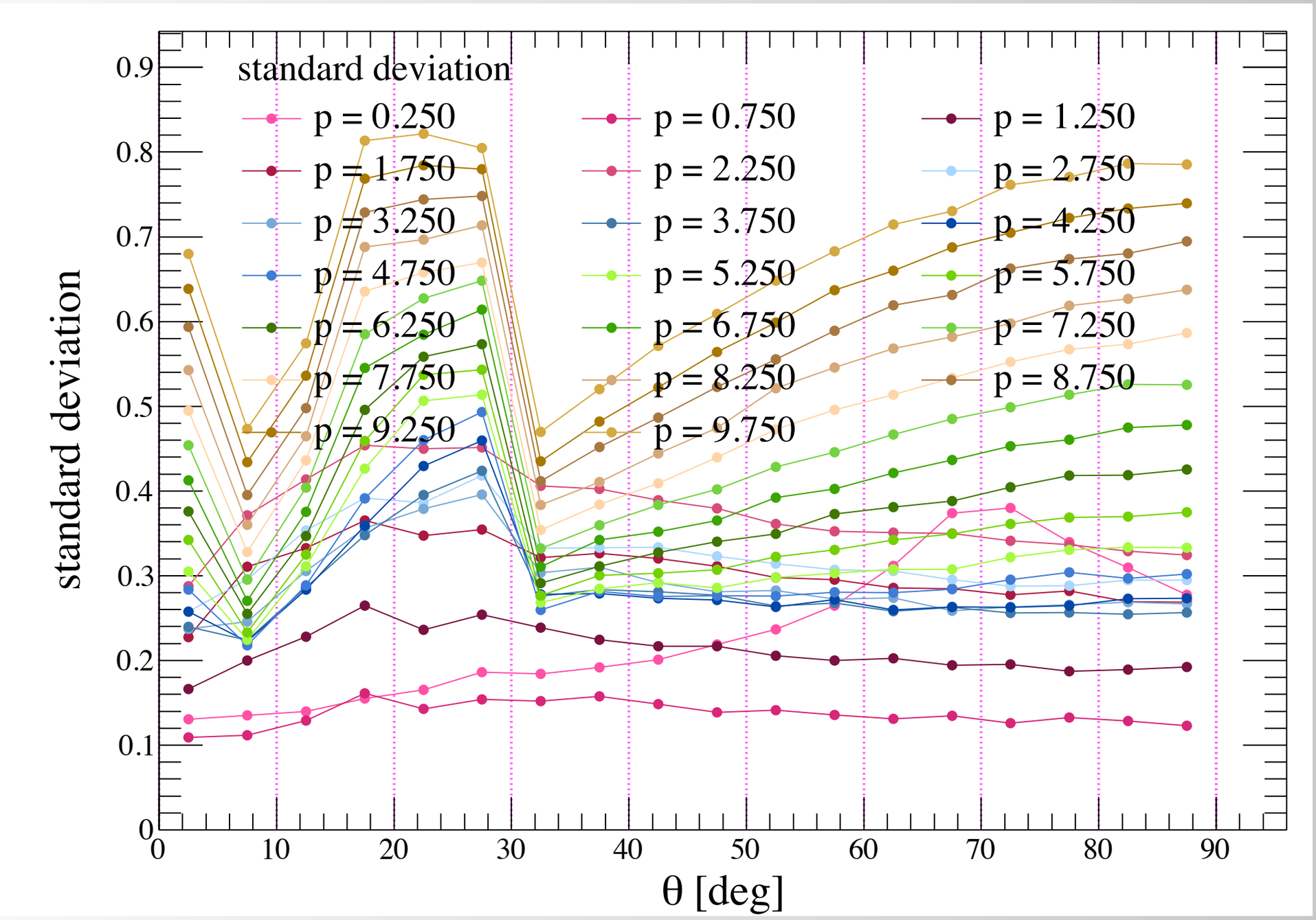




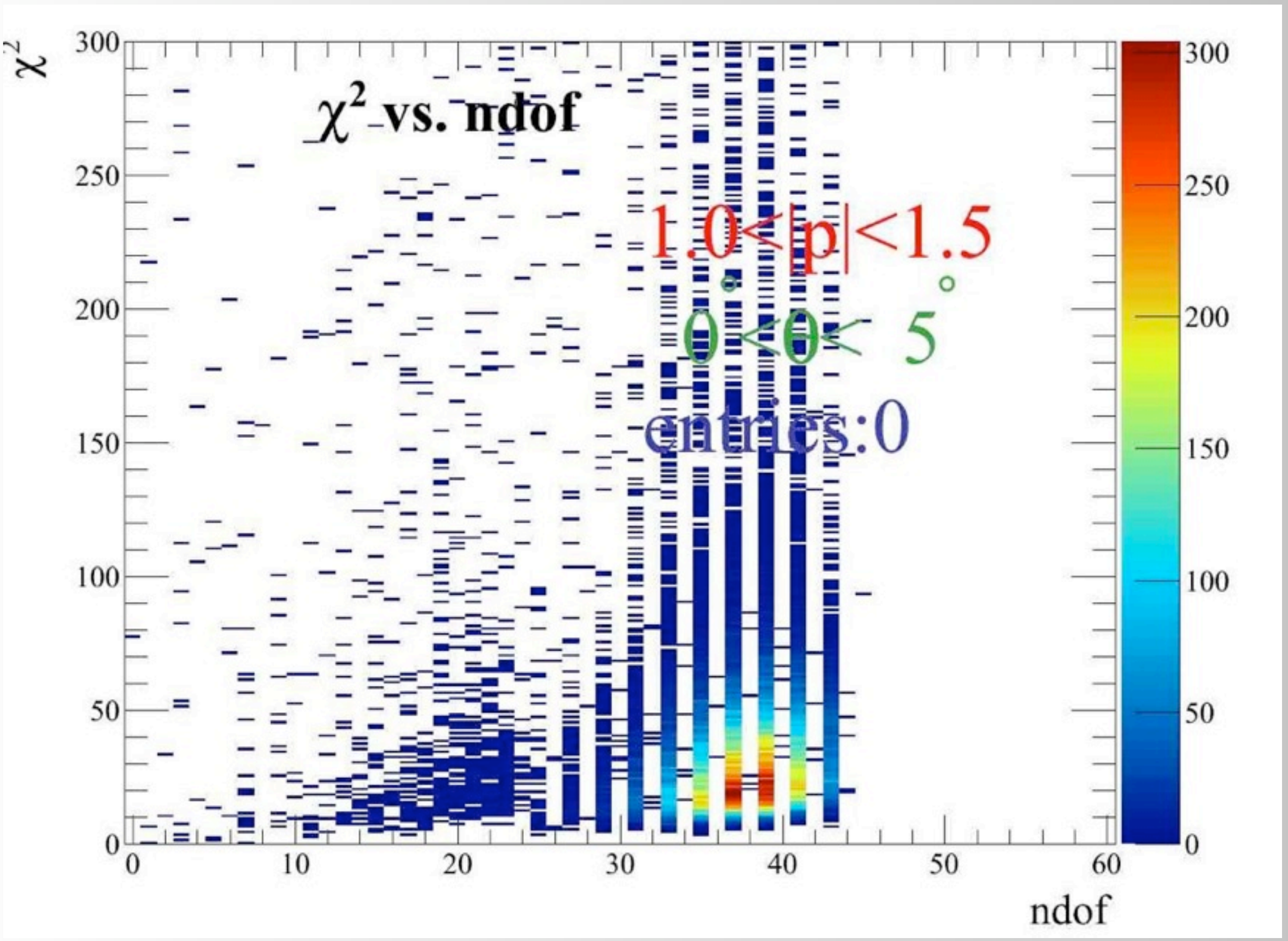
$\Delta p = p_{gen} - p_{recon}$ (2/3)



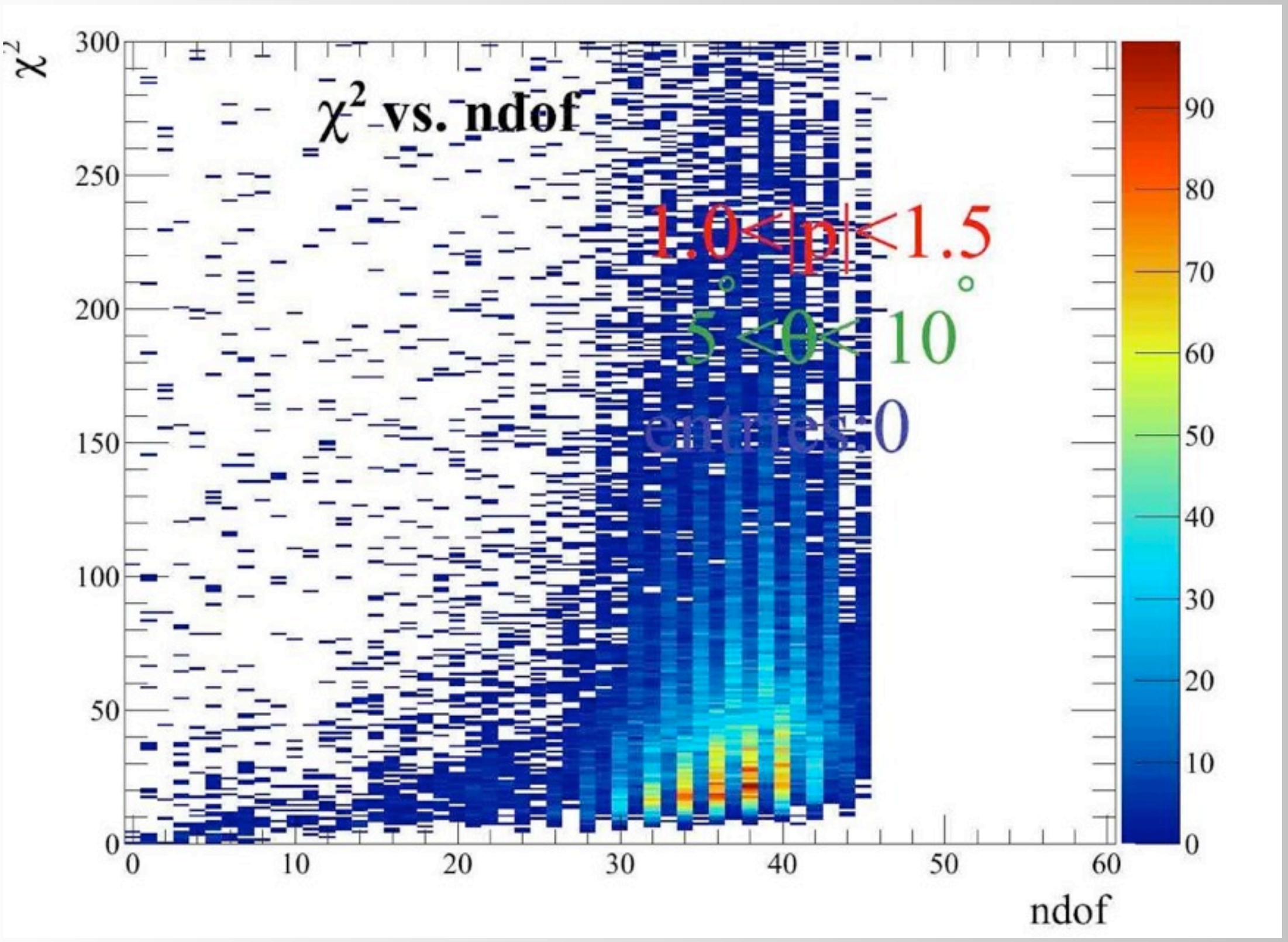
$\Delta p = p_{gen} - p_{recon}$ (3/3)



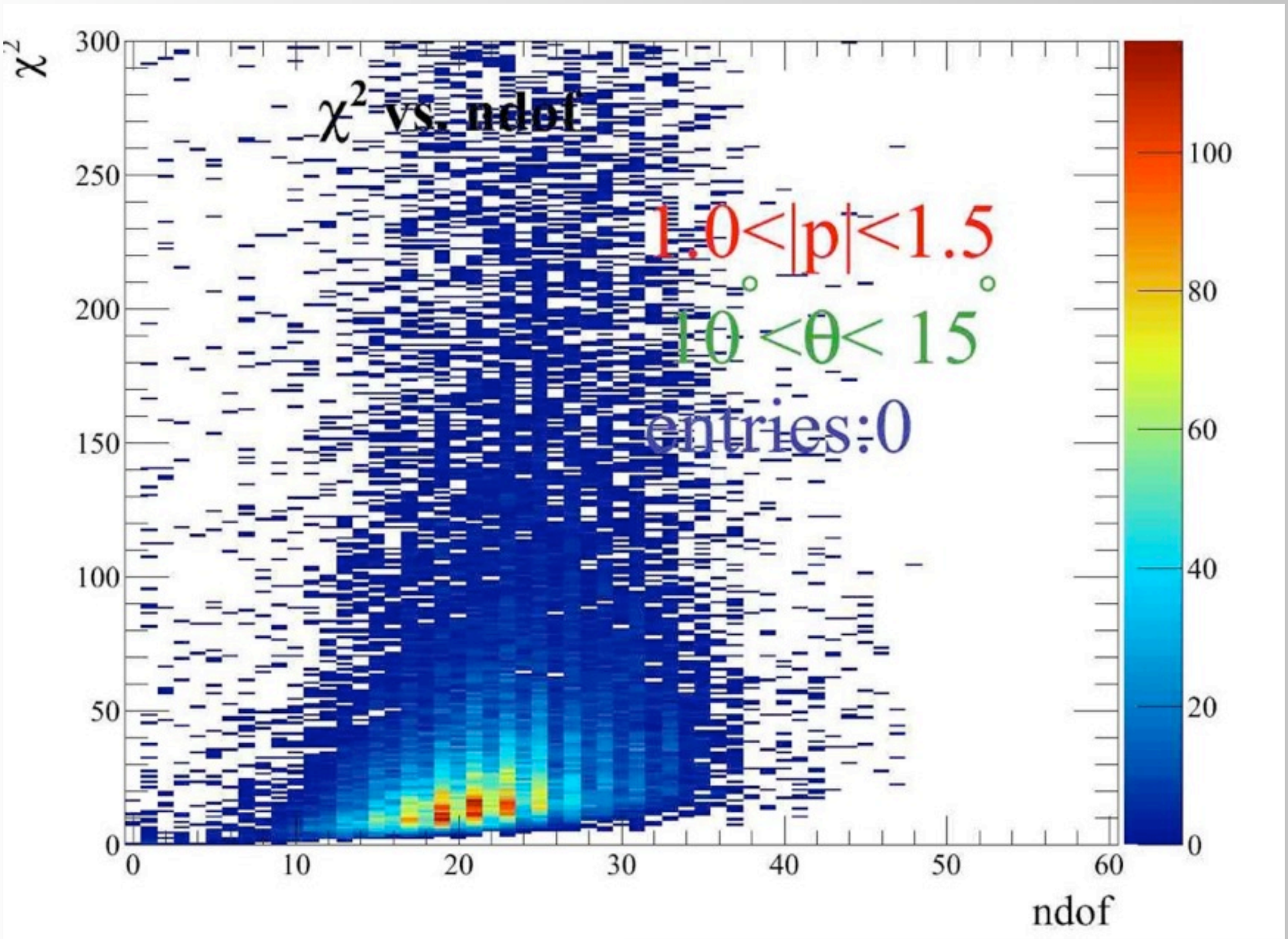
χ^2 vs ndof for each track (1/6)



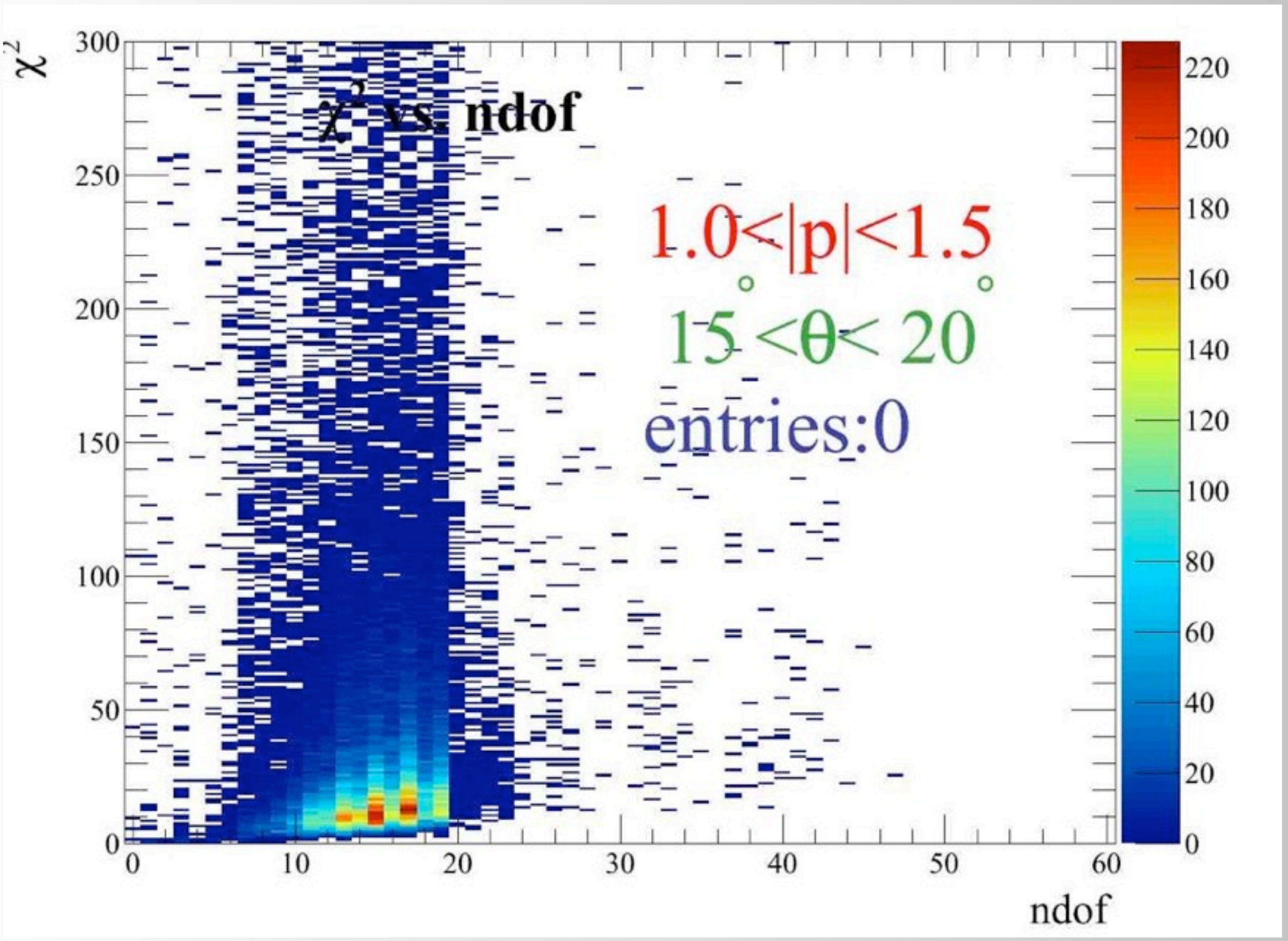
χ^2 vs ndof for each track (2/6)



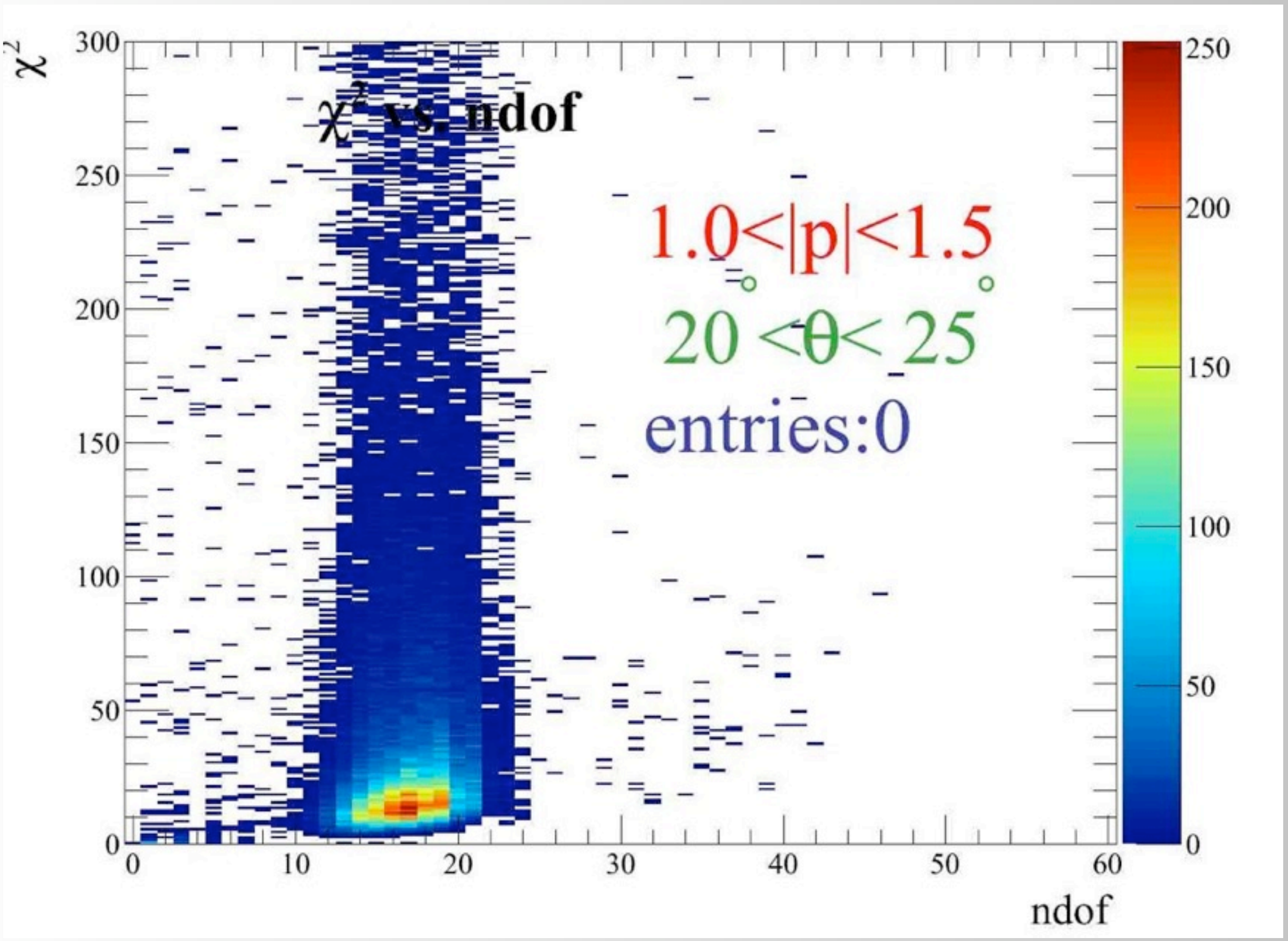
χ^2 vs ndof for each track (3/6)



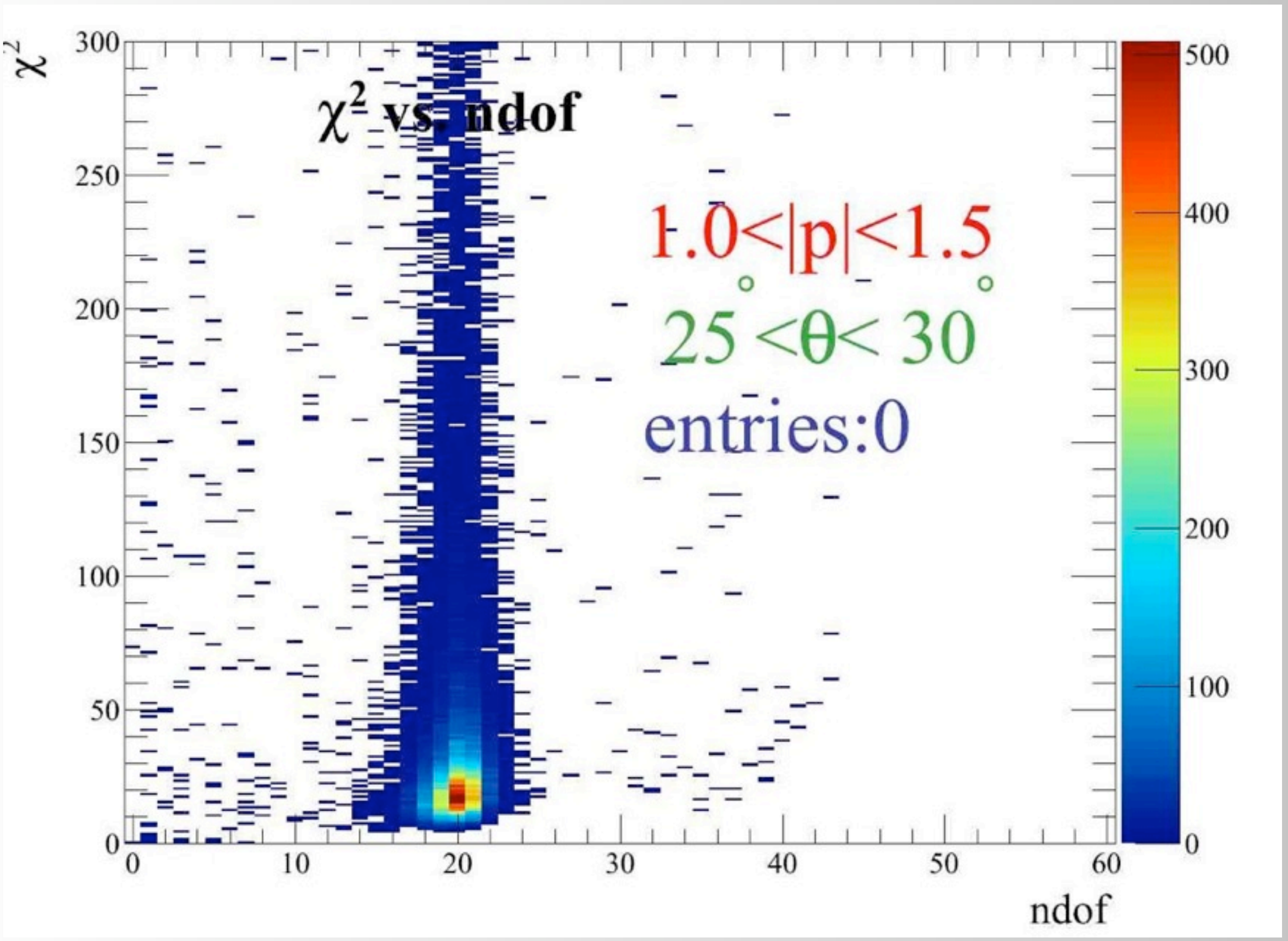
χ^2 vs ndof for each track (4/6)



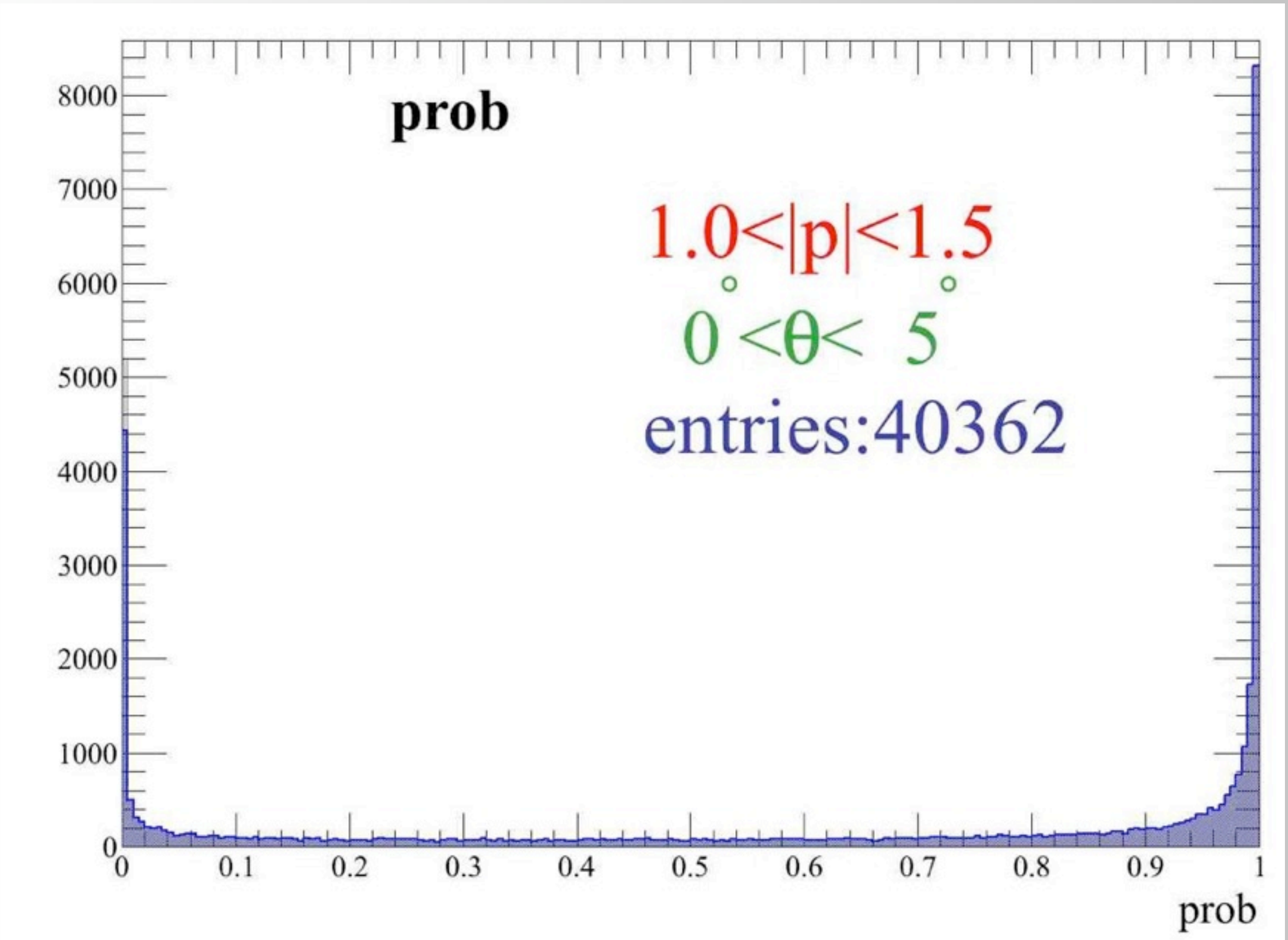
χ^2 vs ndof for each track (5/6)



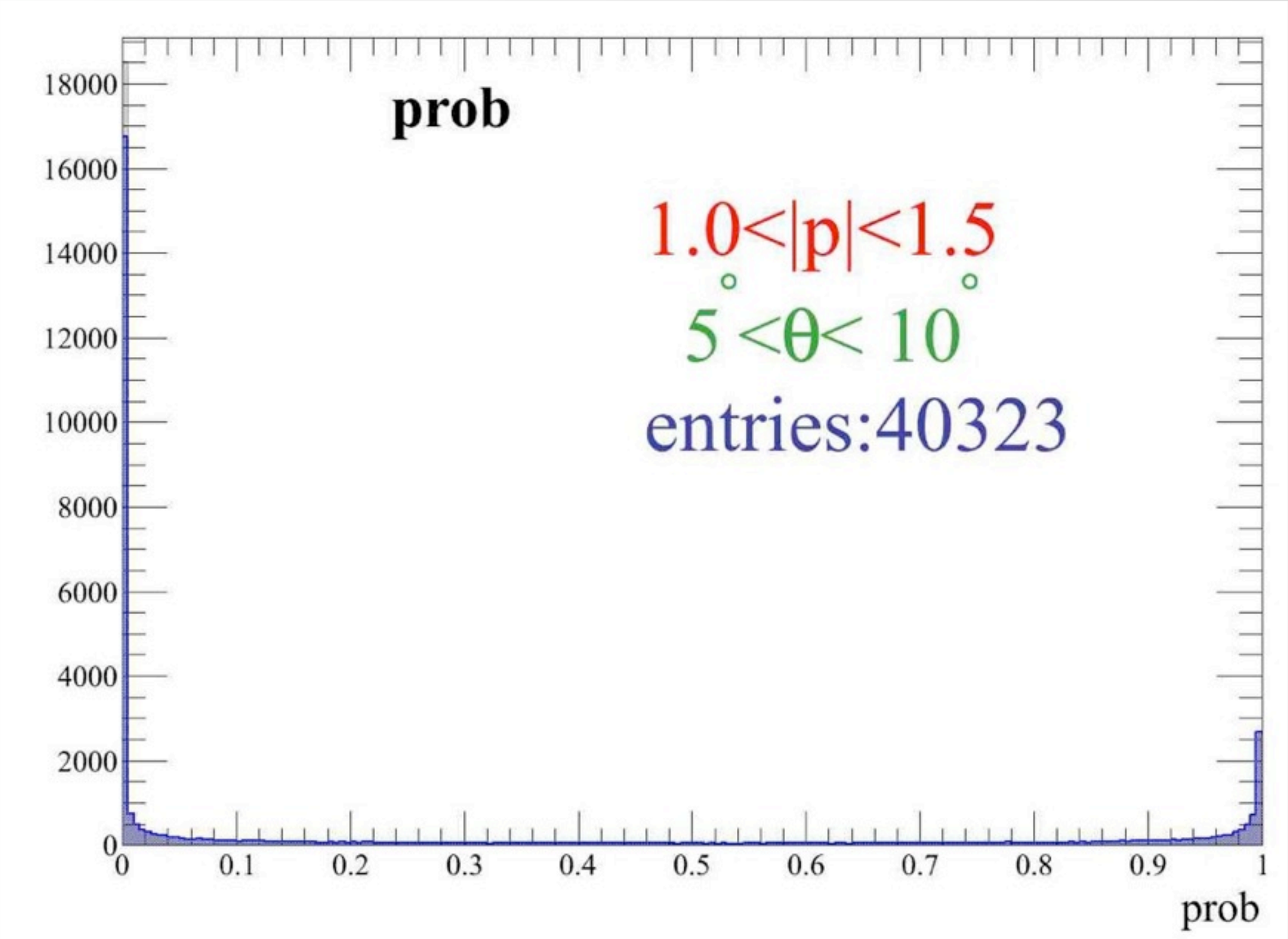
χ^2 vs ndof for each track (6/6)



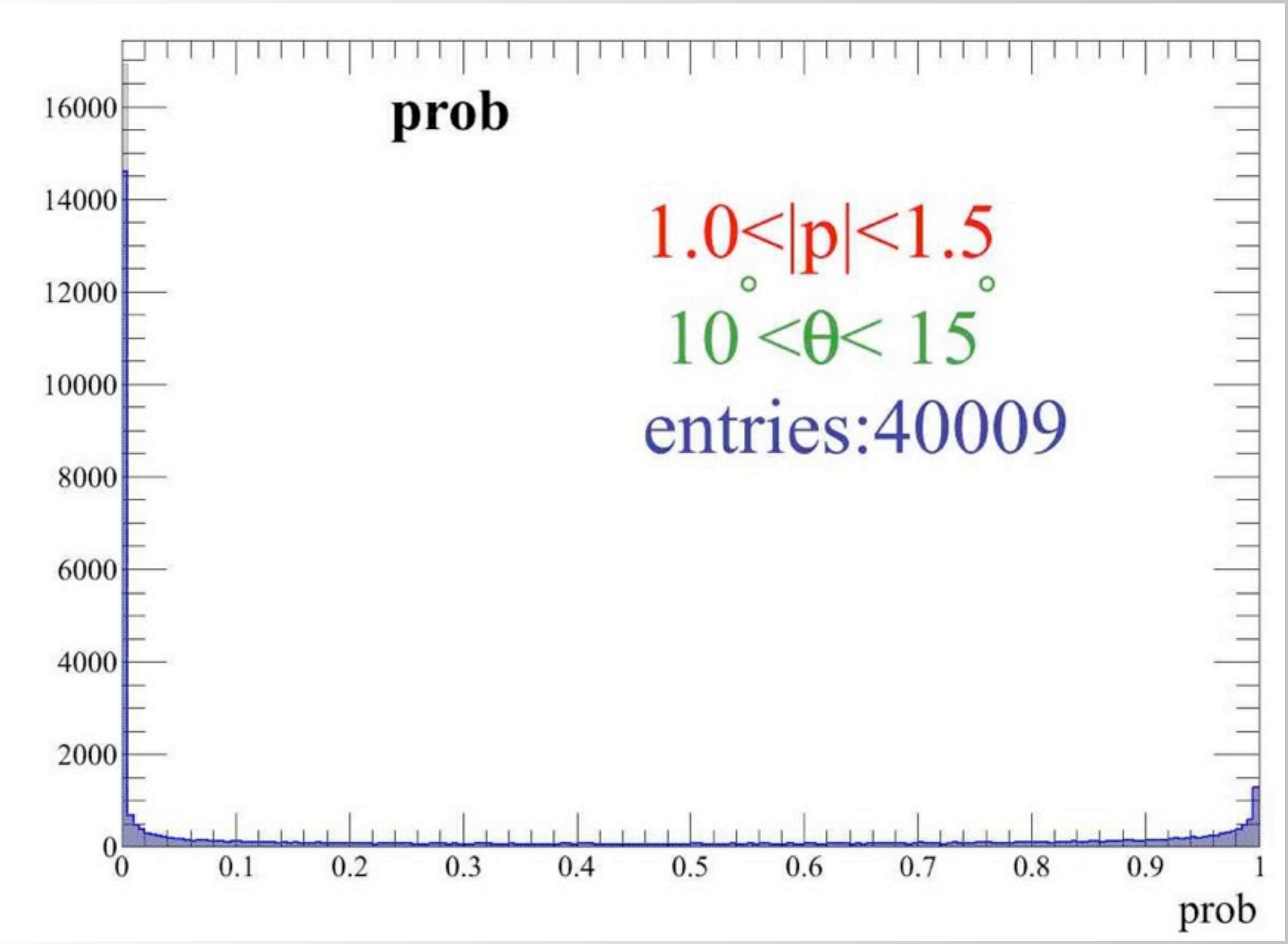
prob for each track (1/4)



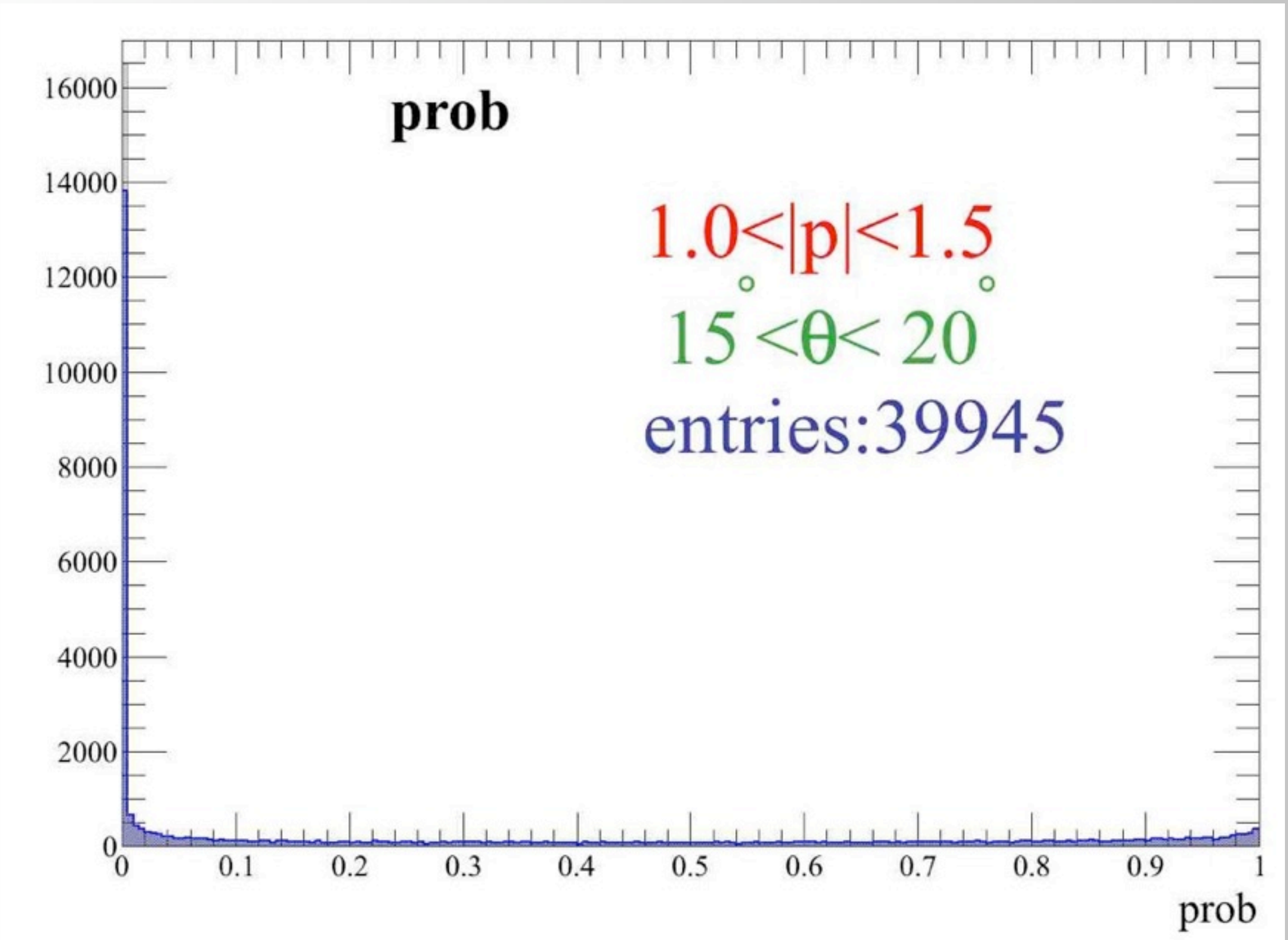
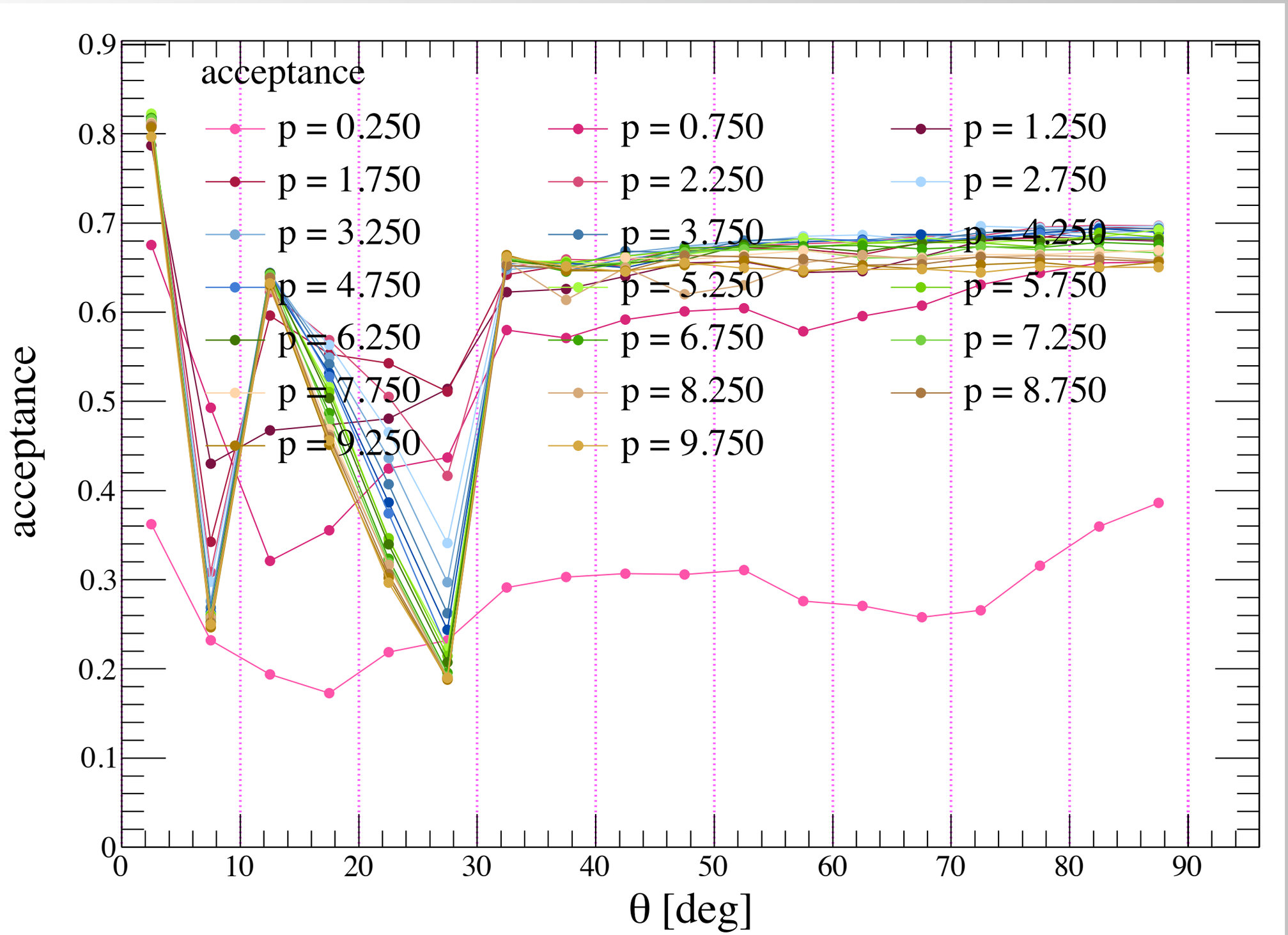
prob for each track (2/4)



prob for each track (3/4)



prob for each track (4/4)



acceptance for each bin (CL>0.10)