Generation

- Pythia 8; (p+p) at 27 GeV; Soft QCD (wo elastic);
- SPDRoot from 1/02/2023; ITS: MAPS 4 layers, no EndCap;
- Beam:

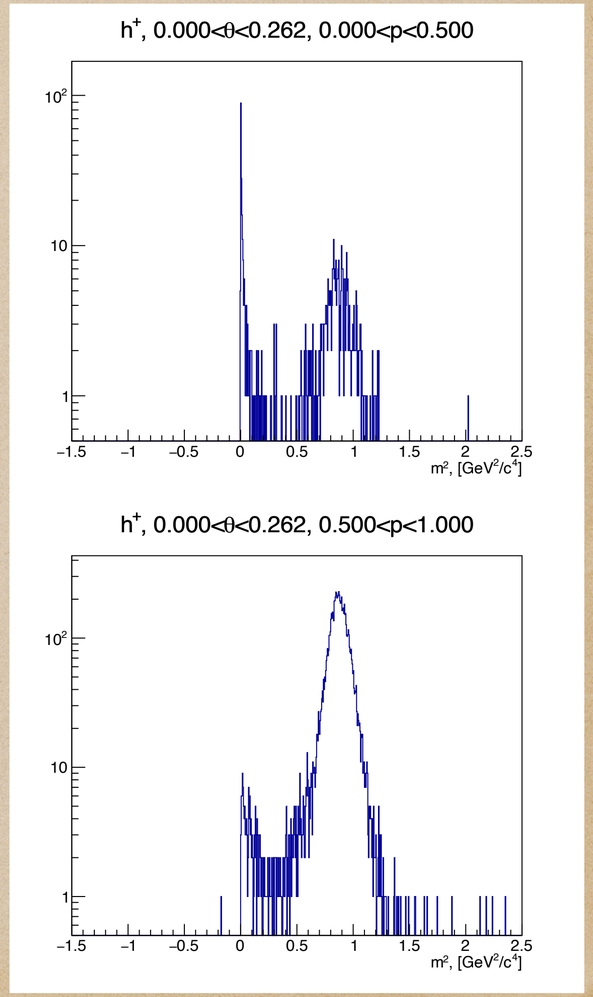
```
primGen->SetBeam(0., 0., 0.025, 0.025);//X0,Y0,Xwidth,Ywidth : 250 microns std. dev.
primGen->SmearGausVertexXY(kTRUE);
//Important : for uniform smearing or SmearVertexXY(kTRUE), give twice the width you want
//uniform smearing is done from -width/2 to width/2
//for Gaussian smearing or SmearGausVertexXY(kTRUE), give sigma or standard deviation you want

primGen->SetTarget(0., 30.);//Z0,Zwidth, 30 cm std. dev.
primGen->SmearGausVertexZ(kTRUE);
//Important : for uniform smearing or SmearVertexZ(kTRUE), give twice the width you want
//uniform smearing is done from -width/2 to width/2
//for Gaussian smearing or SmearGausVertexZ(kTRUE), give sigma or standard deviation you want
```

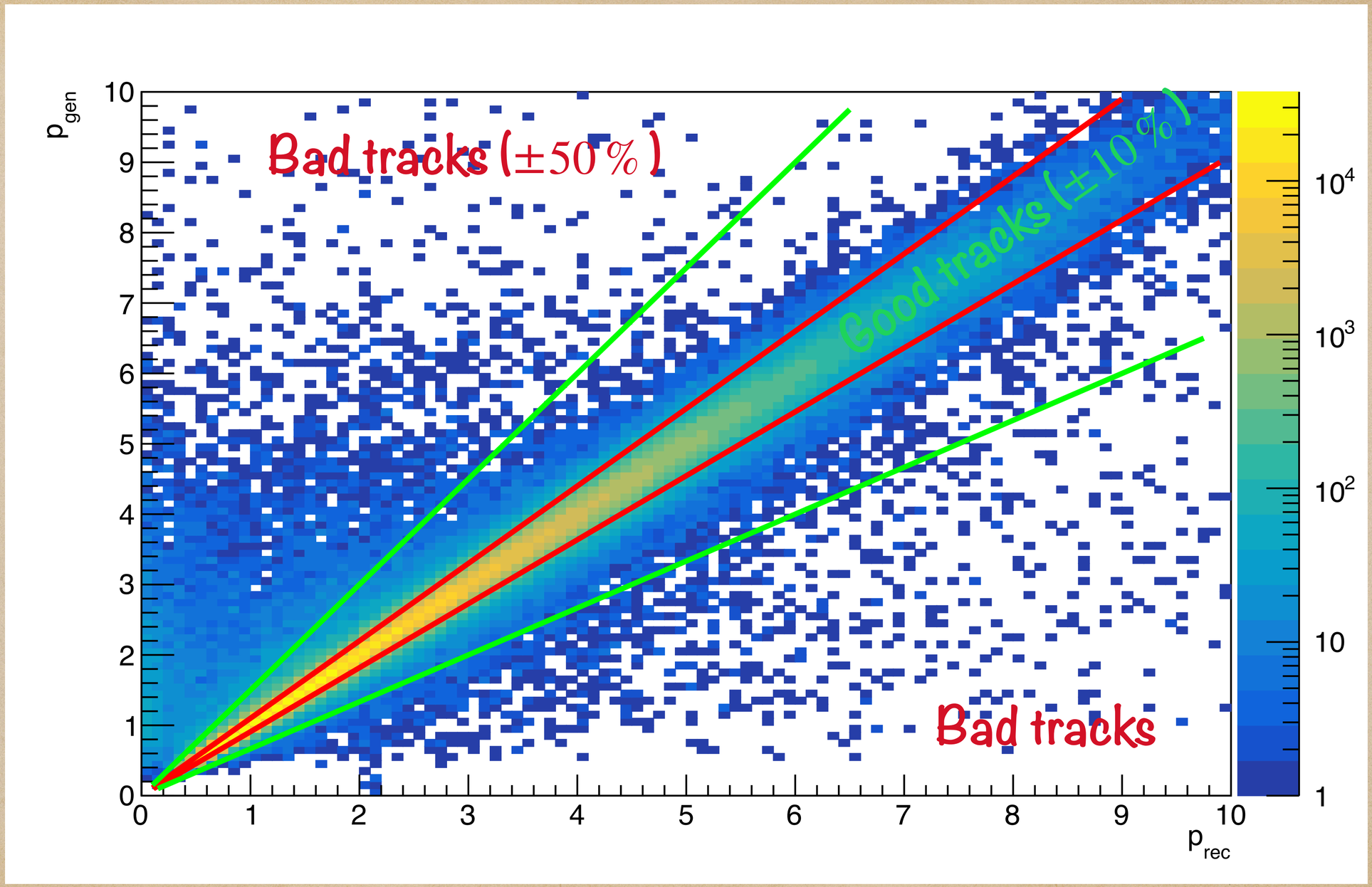
Reconstruction

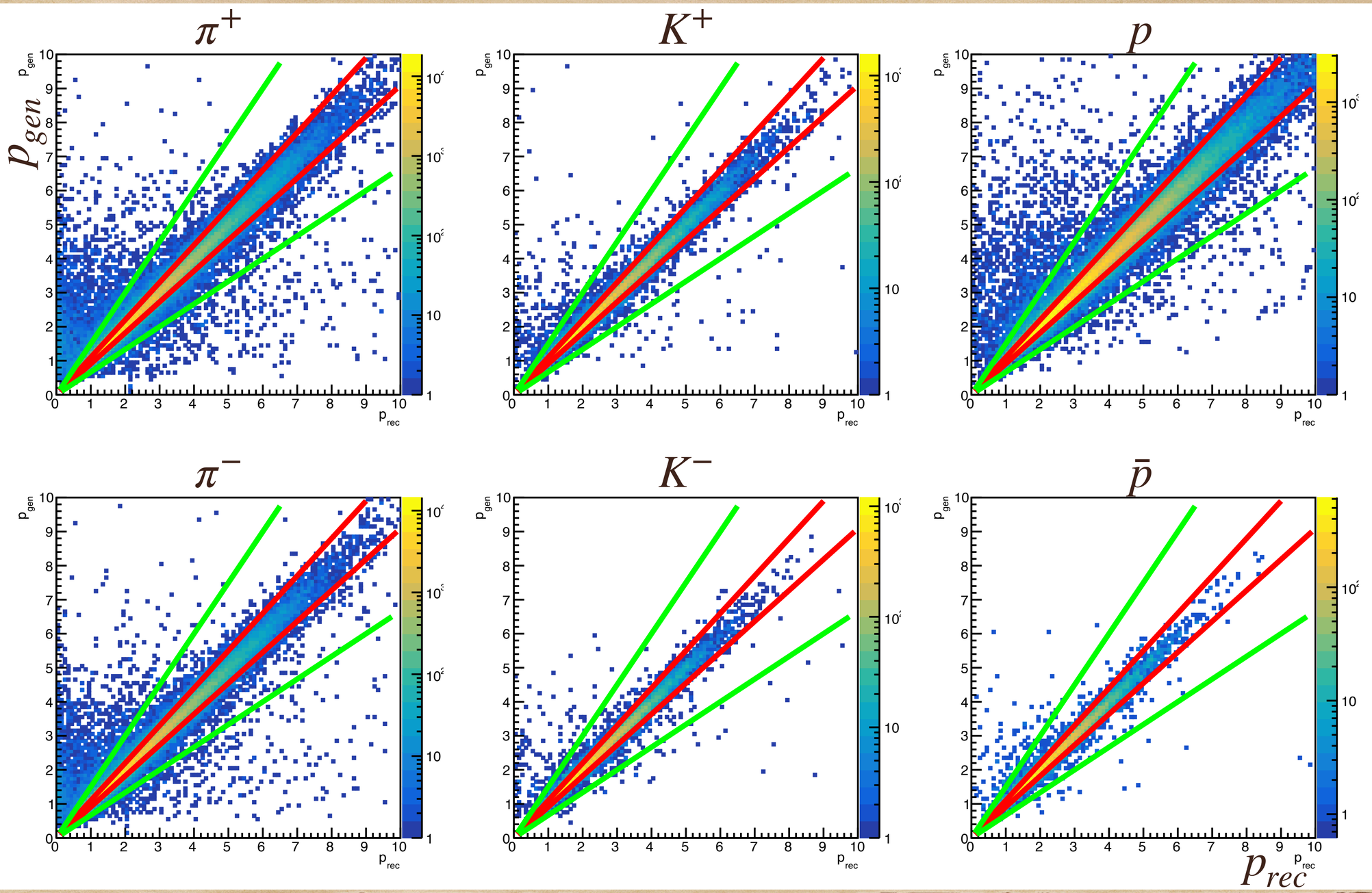
- SpdMCTtacksFinder (mc-tracks + track-fit-parameters (optionally)
- SpdMCVerticesFitter (vertices-fit-parameters -> mc-vertices)
- SpdRCVerticesFinder (rc-vertices + vertices-fit-parameters)

Selection

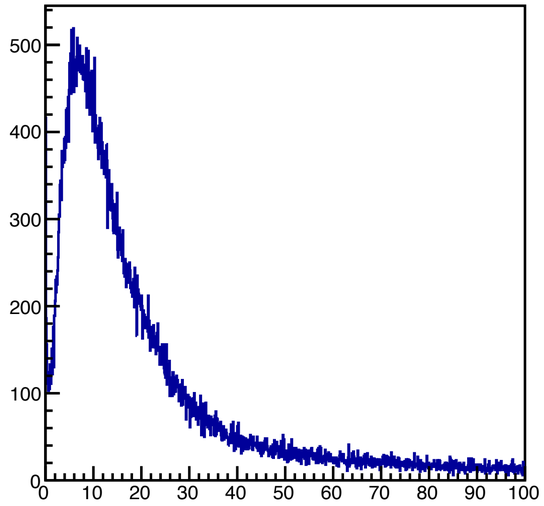
- Reconstructed Primary Vertex
- Protons: PID = 2212, $(p_{rec} < 1\ GeV/c\ \&\ \theta_{rec} < 15^0)$
- Good tracks: $m^2_{TOF} > 0.7\ (GeV/c^2)^2$
- Bad tracks: $m^2_{TOF} < 0.2\ (GeV/c^2)^2$ — 50% of tracks with p<0.5 GeV/c

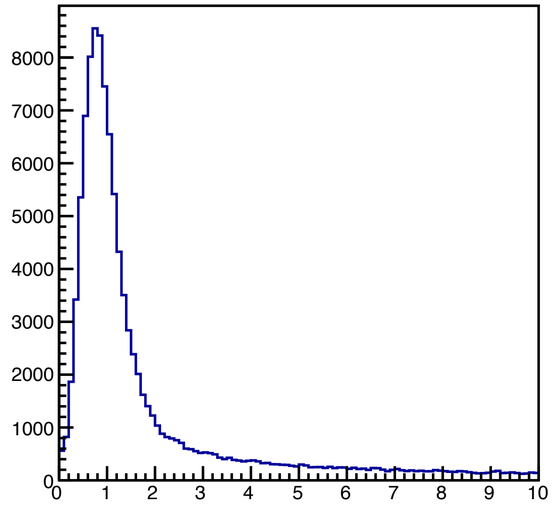


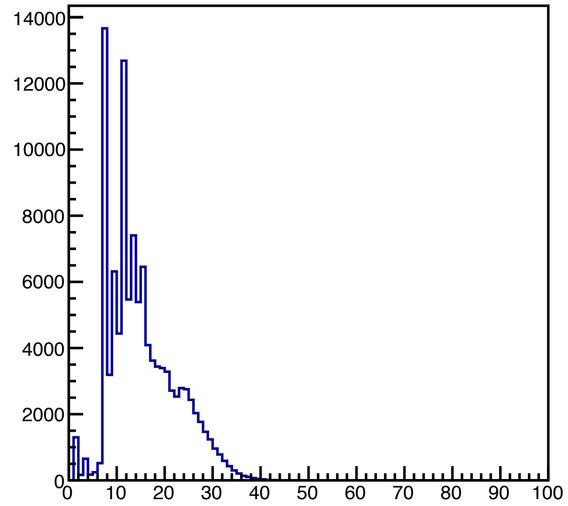

Bad tracks (±50%)
Good tracks (±10%)
Bad tracks
p_{gen}
p_{rec}
0
1
2
3
4
5
6
7
8
9
10
10^4
10^3
10^2
10
1


π^+
K^+
p
π^-
K^-
$\bar{p}$
p_{gen}
p_{rec}
p_gen
p_rec

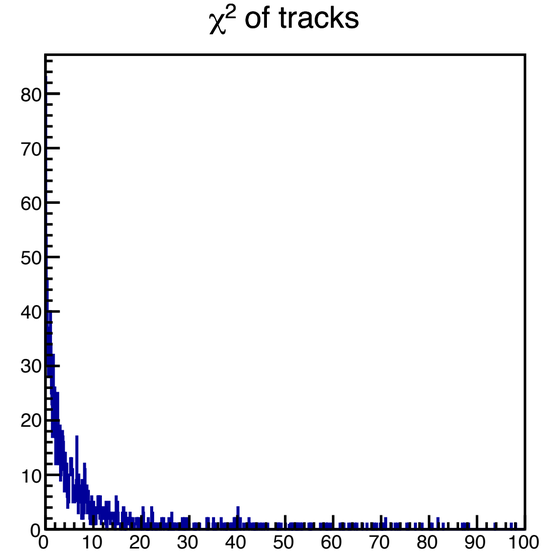
Good Tracks

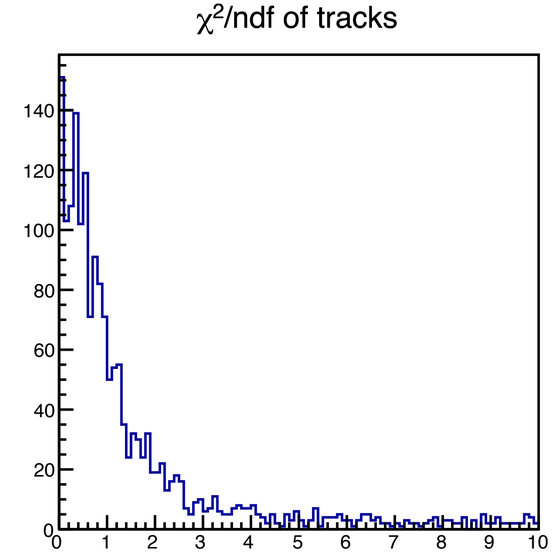


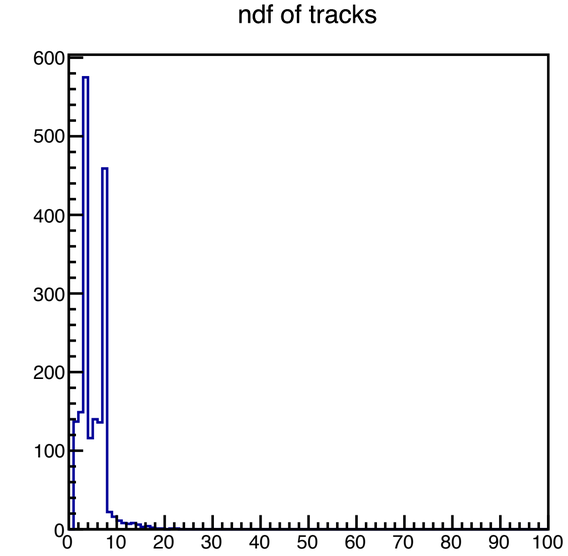




Bad Tracks







What is NDF?

+ N hits in STRAW Endcap

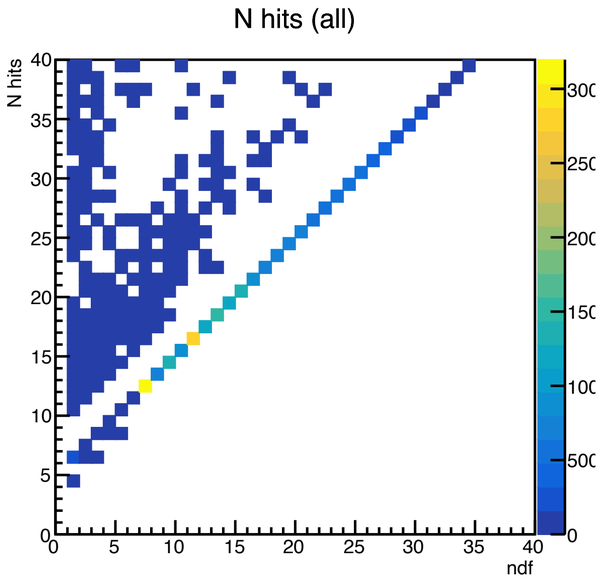
+ N hits in STRAW Barrel

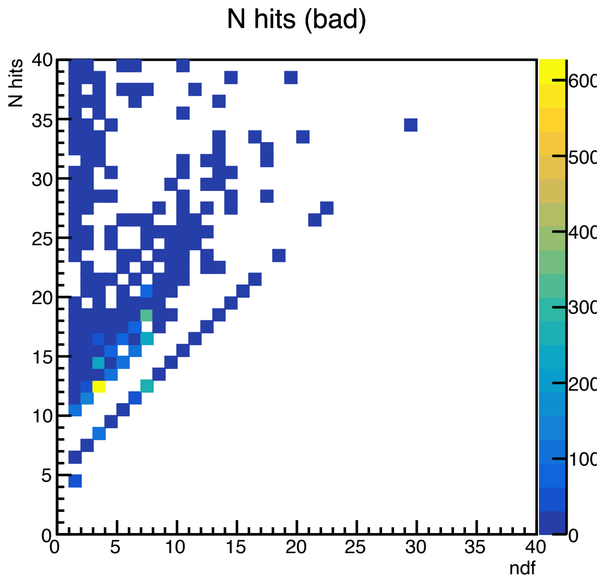
+ 2 * N hits in ITS

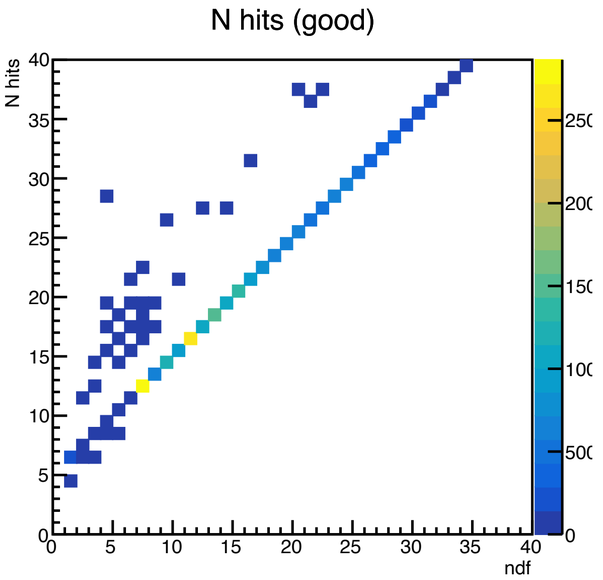
- N of Fit parameters

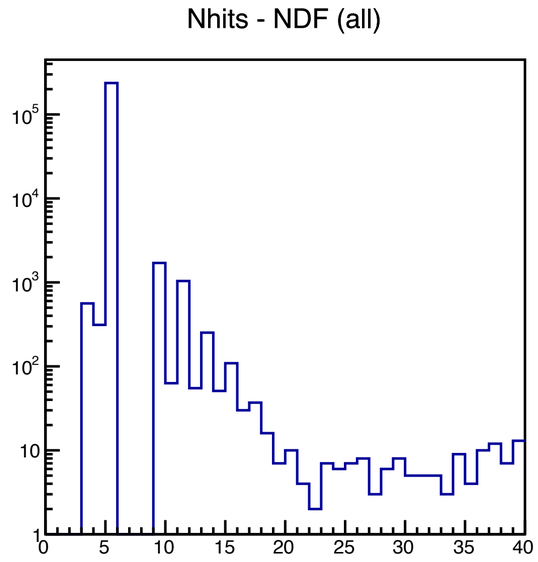
- N of failed hits ?

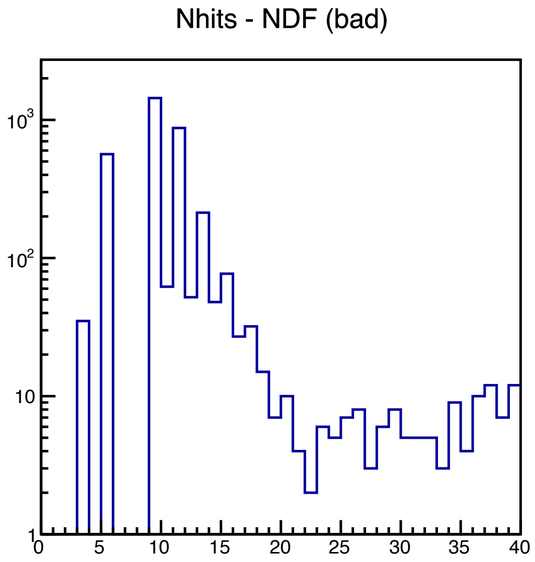
- ...?

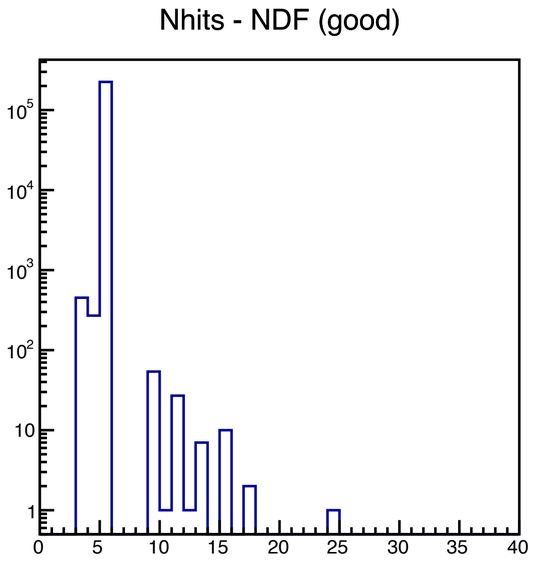

N hits (all)
N hits
ndf

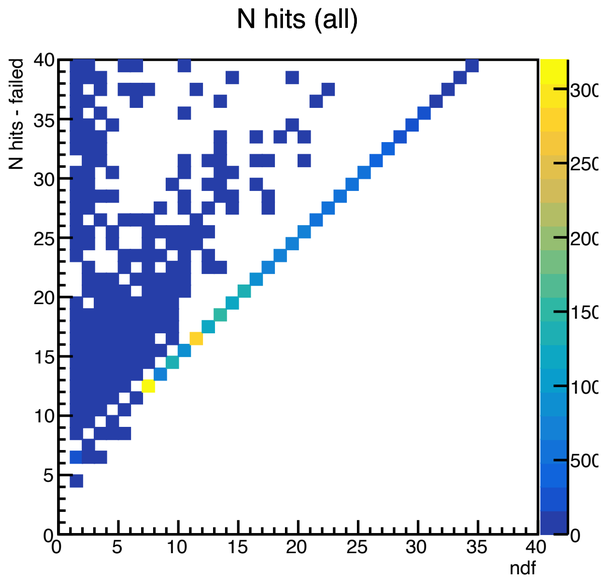

N hits (bad)
N hits
ndf

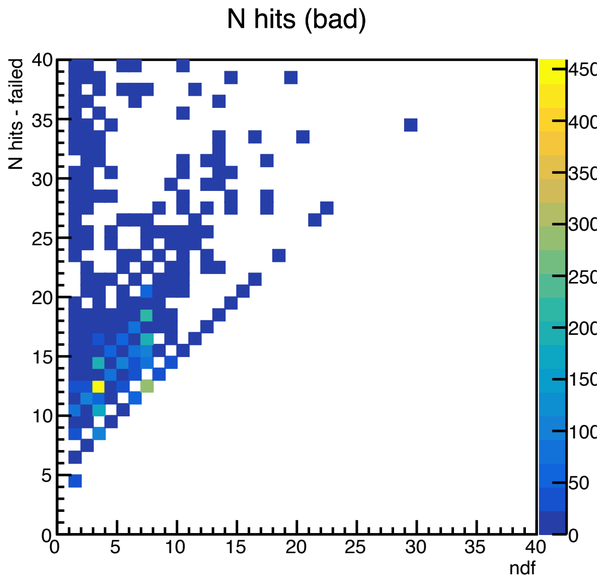

N hits (good)
N hits
ndf

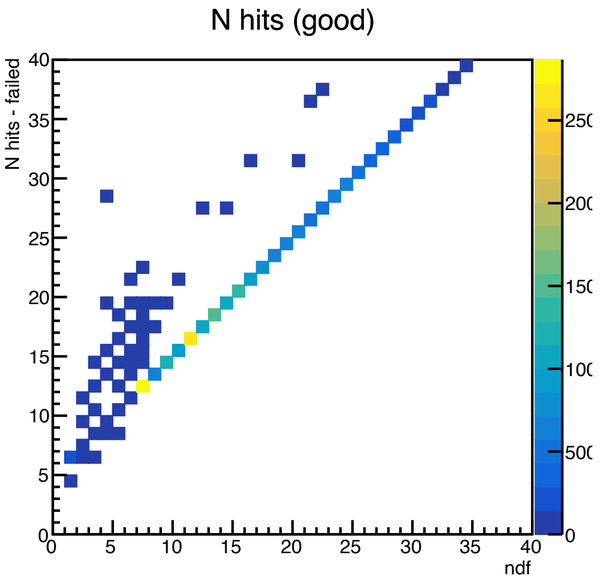

Nhits - NDF (all)

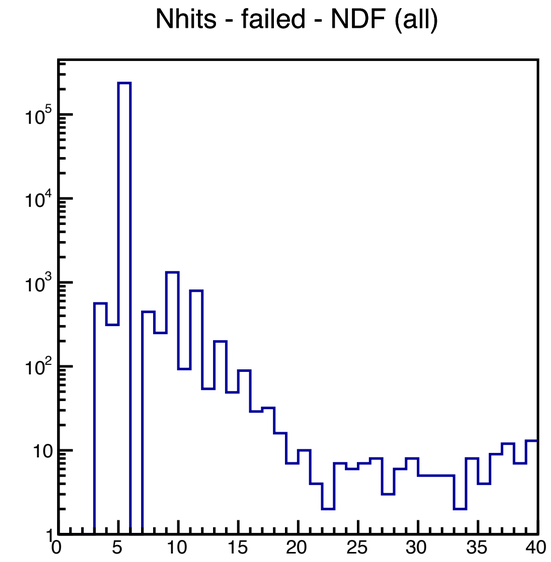

Nhits - NDF (bad)

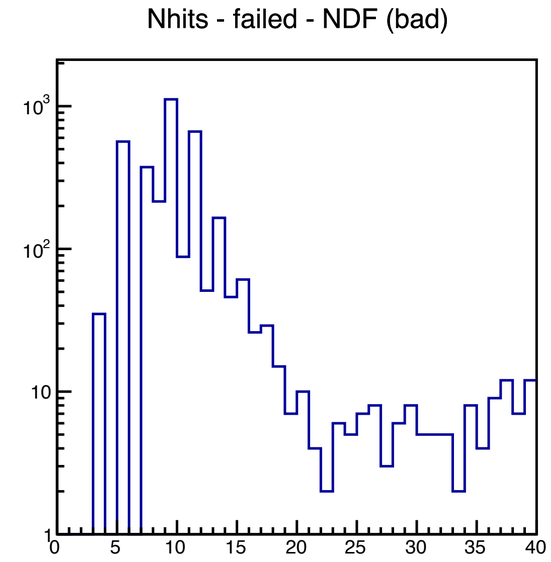

Nhits - NDF (good)

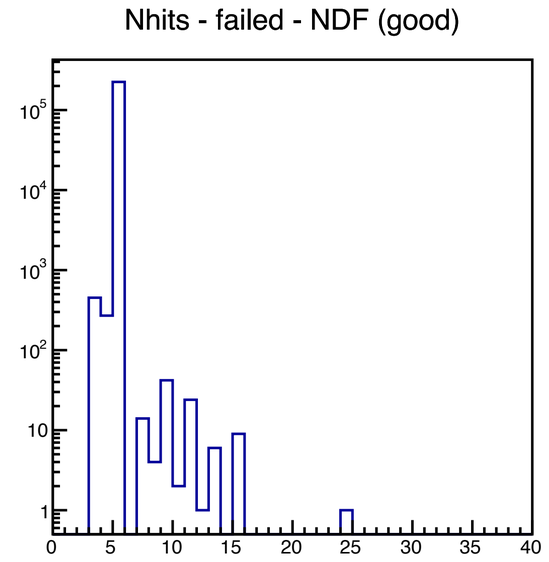

N hits (all)
N hits - failed
ndf


N hits (bad)
N hits - failed
ndf

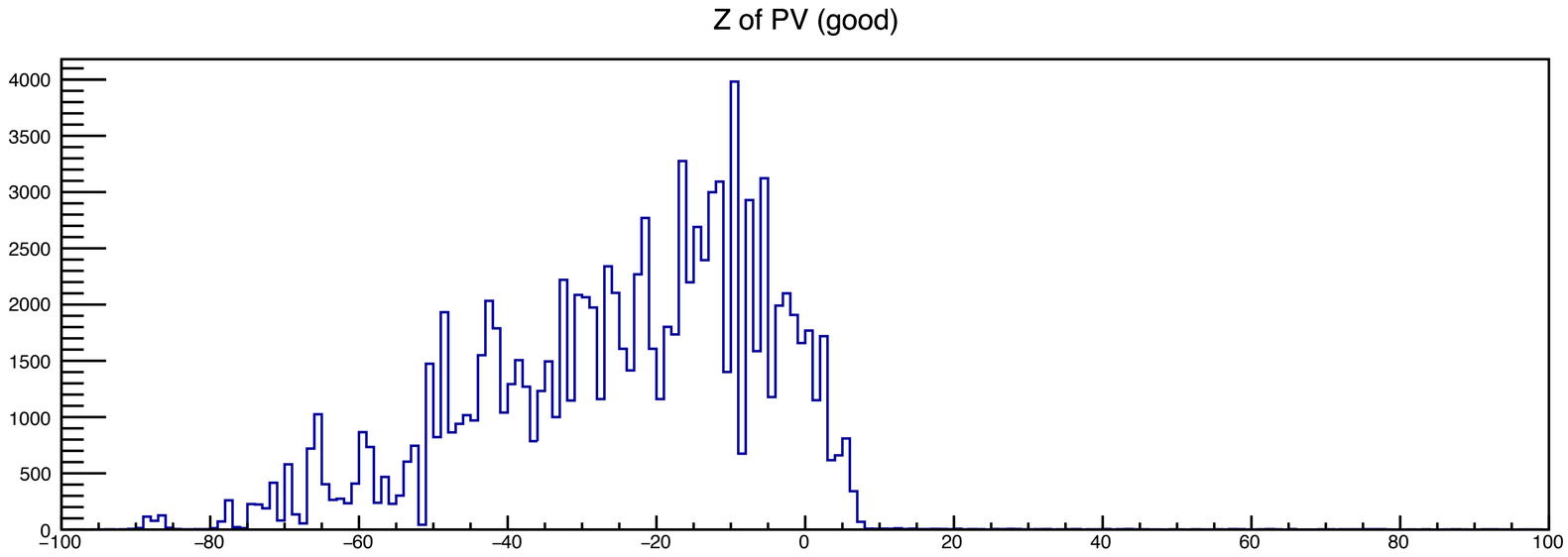

N hits (good)
N hits - failed
ndf


Nhits - failed - NDF (all)

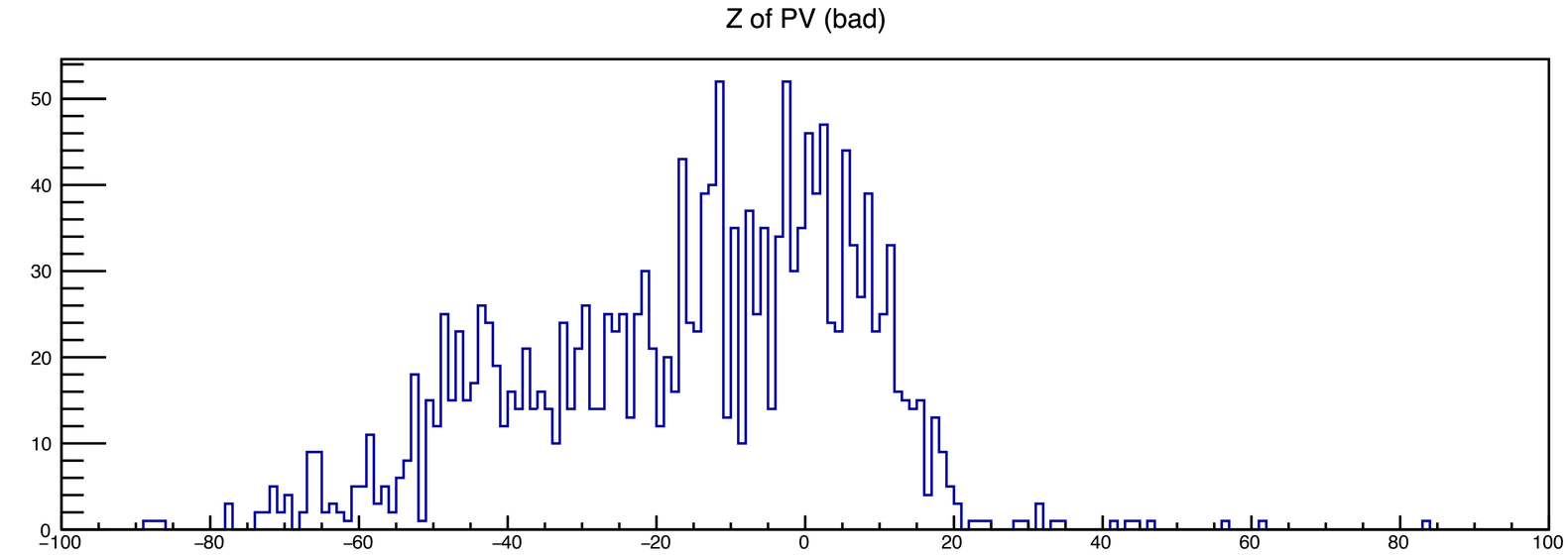

Nhits - failed - NDF (bad)


Nhits - failed - NDF (good)

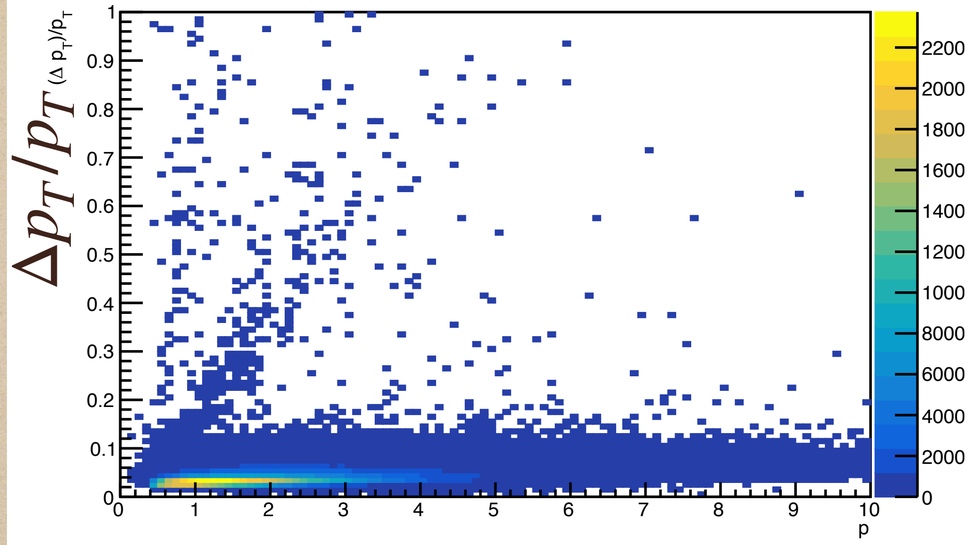
Good Tracks

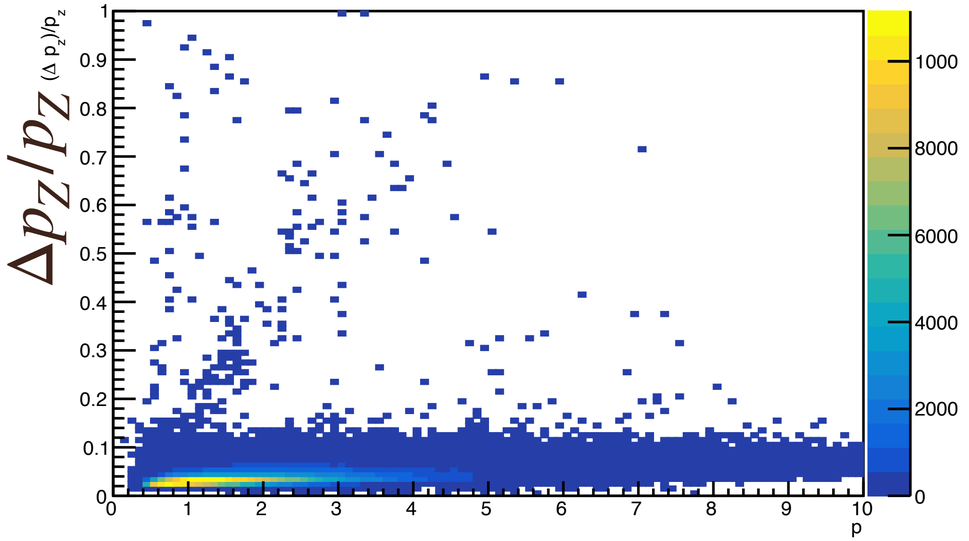


Bad Tracks



Good Tracks





Bad Tracks