MUON TRACKS WITH MINIDTS IN SND@LHC

Luigi Guiducci
Giulia Paggi
Università and INFN Bologna

MiniDT tracks in SND

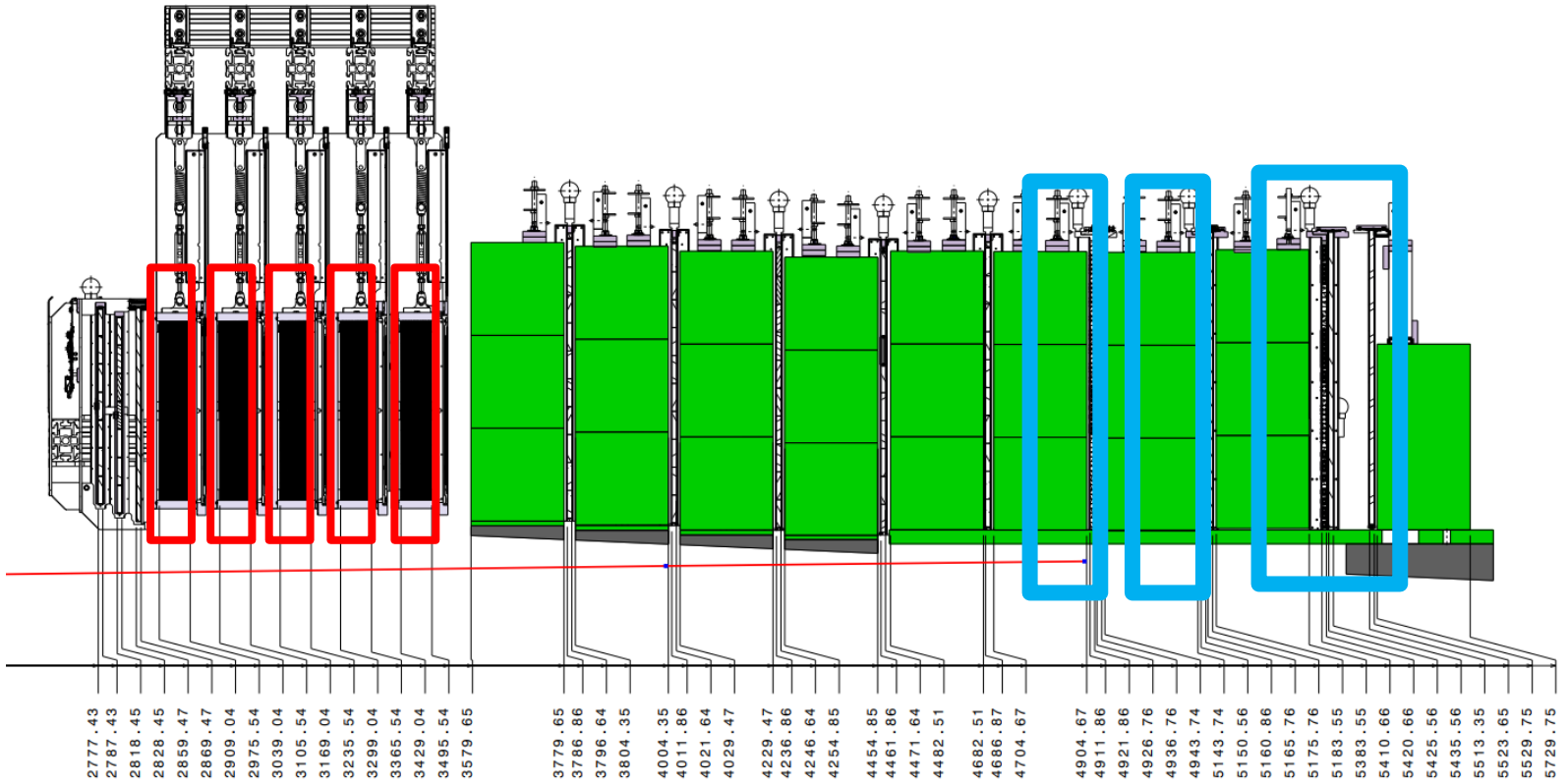
Physics sample: particle gun with energy from 100 GeV to 1 TeV

Data files: look at events in which a track could be reconstructed

- with only SciFi information
- with DS only information
- with DS+miniDT information

The MiniDTs are inserted at the end of the current system. They enter the simulation as 8 points with resolution 250 µm

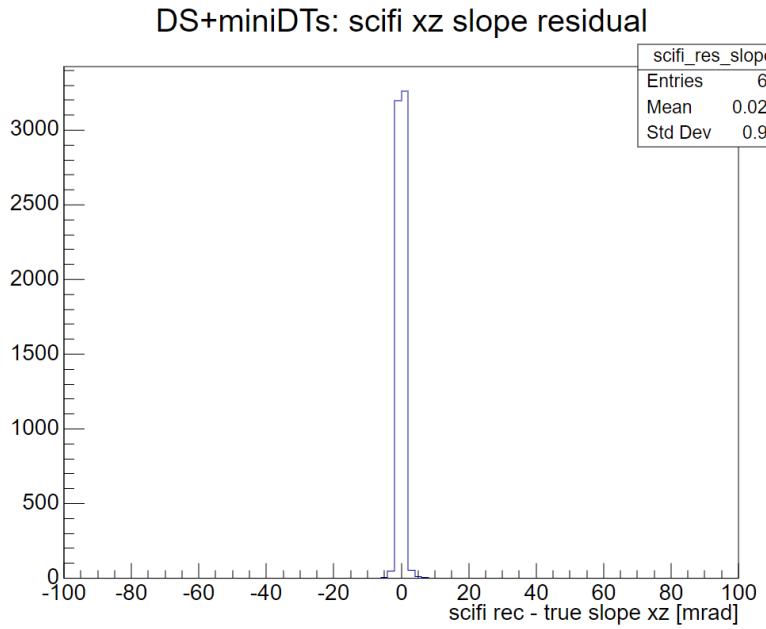
Thanks to Simona Ilieva Ilieva

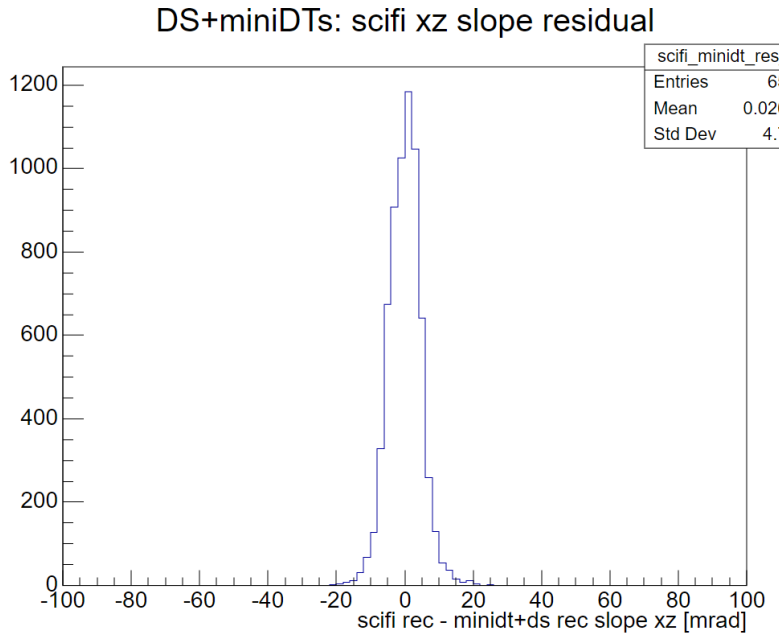


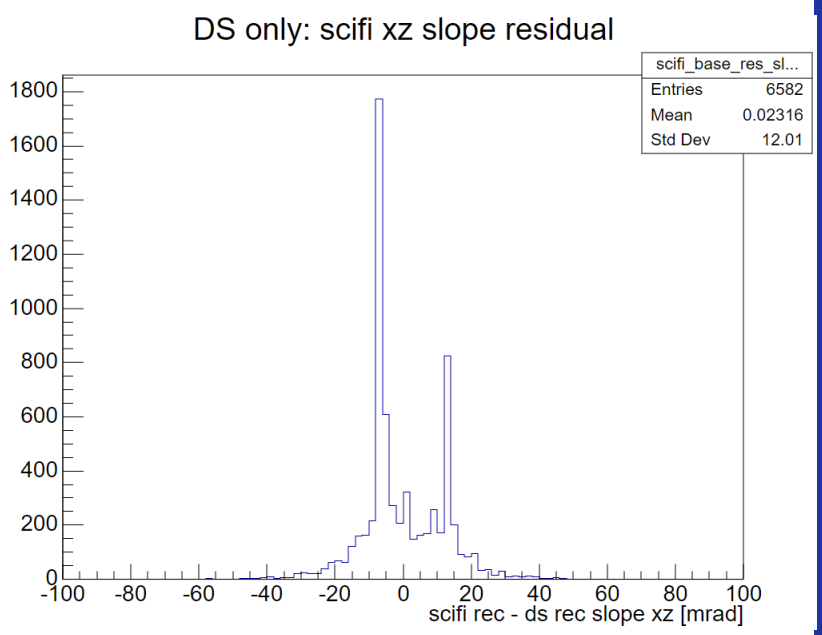
Slope difference

Study events for which I have 1 SciFi reconstructed track and 1 DS+MiniDT reconstructed track with $\chi^2 > 5$, 1 DS only track with no further requirements

Check: track slope difference

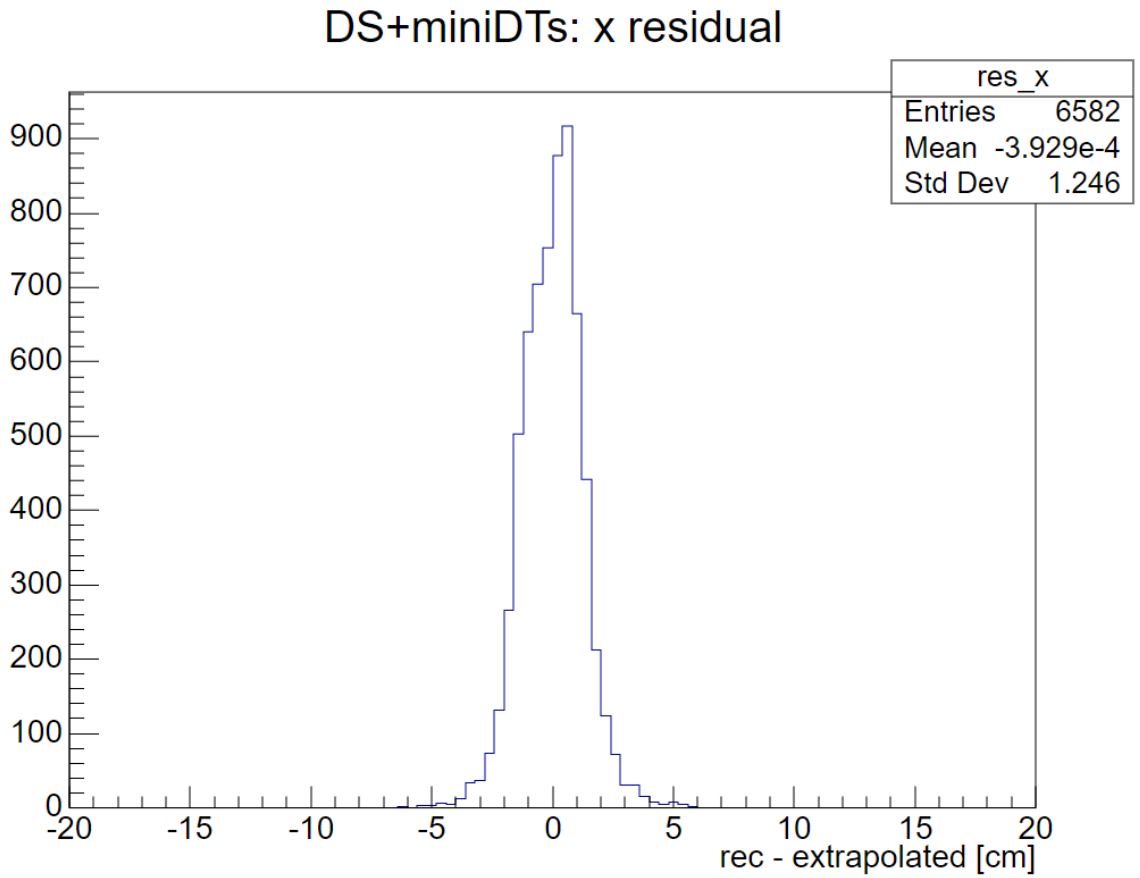


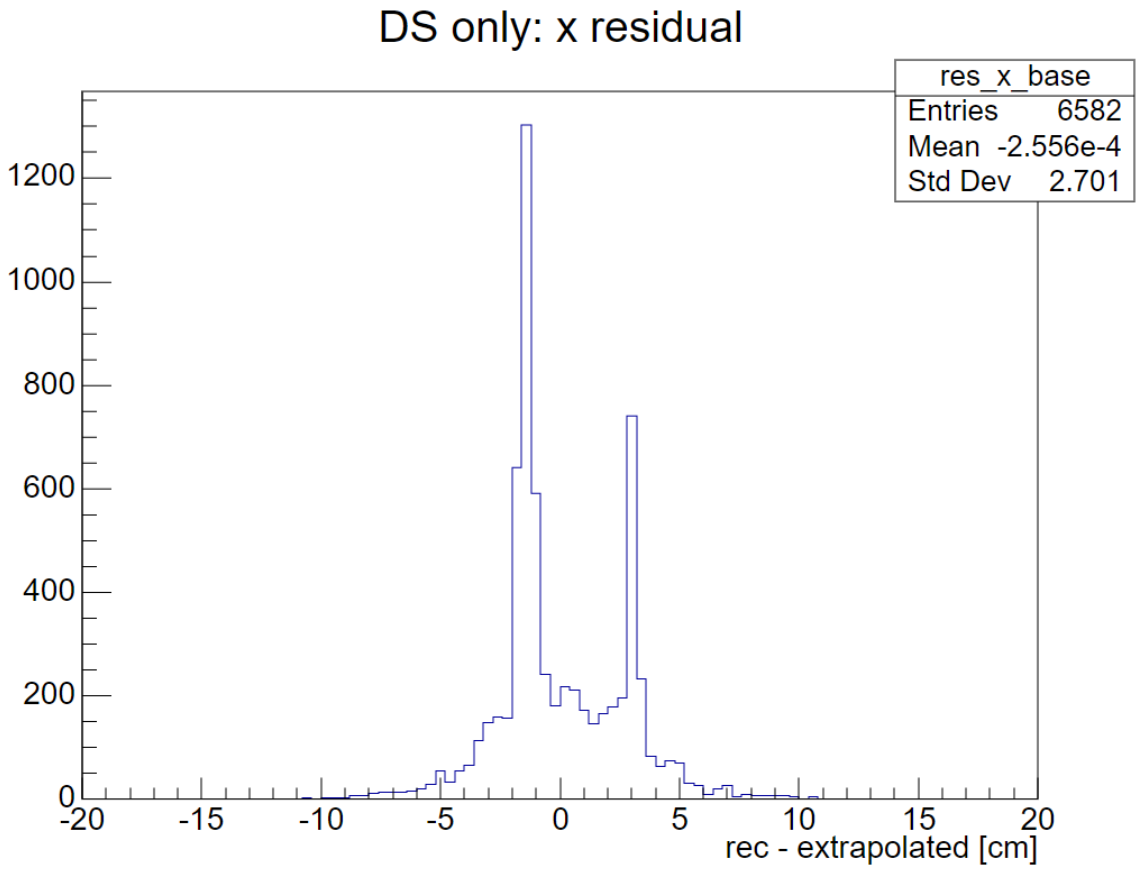




Position difference

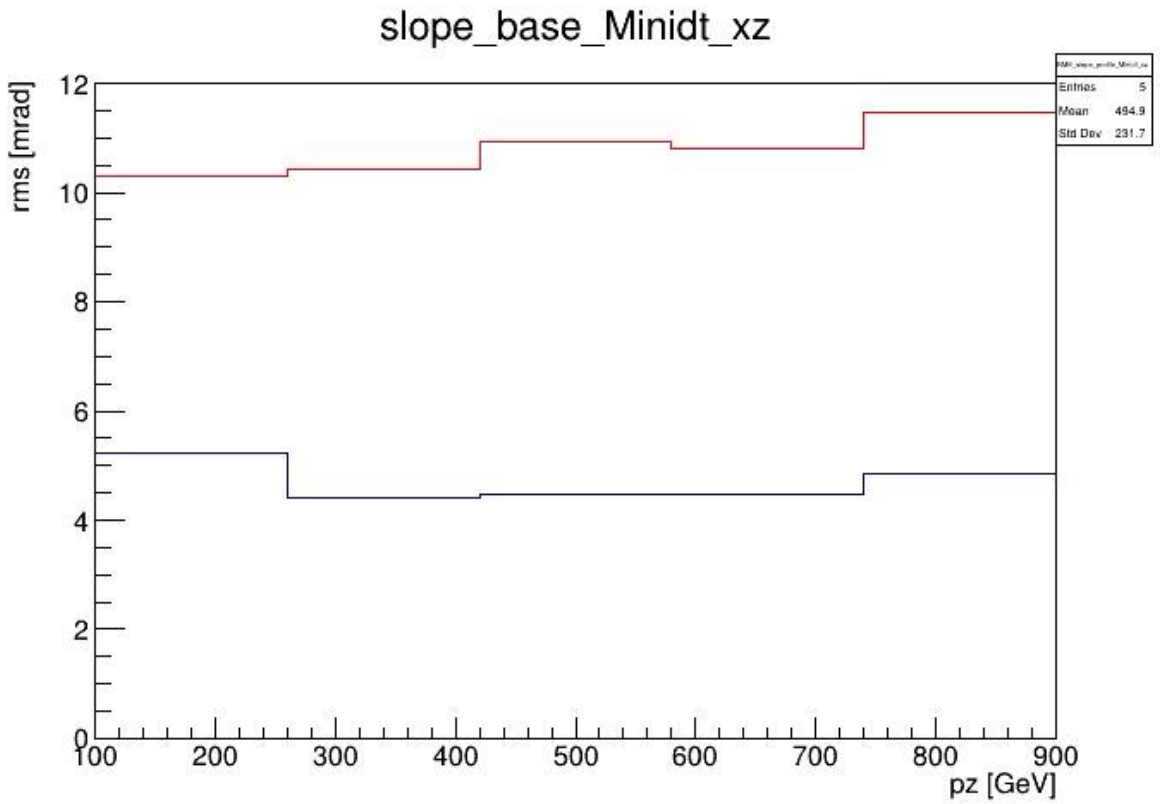
Extrapolate the track to the first SciFi point used in the SciFi track and compute residual

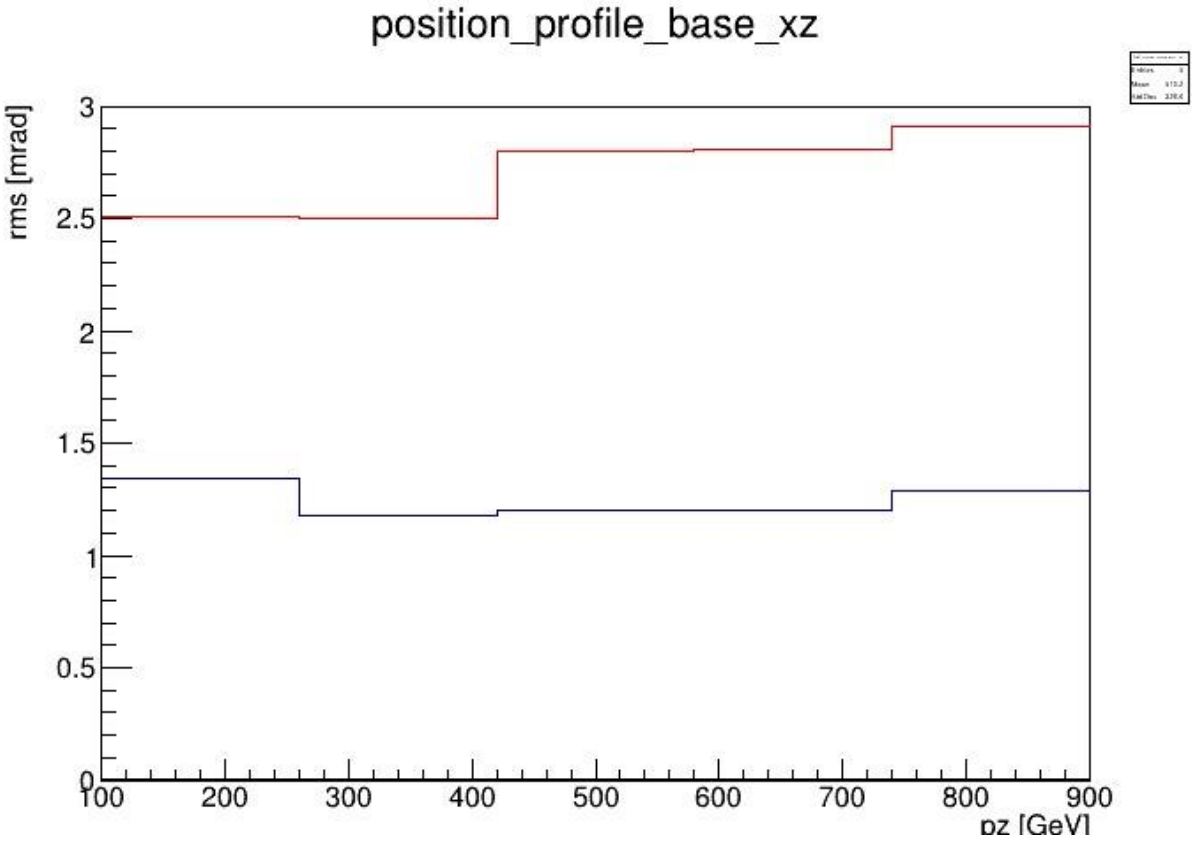




Resolution difference

For the whole energy range using the MiniDTs allows for a more precise information both on slope and position

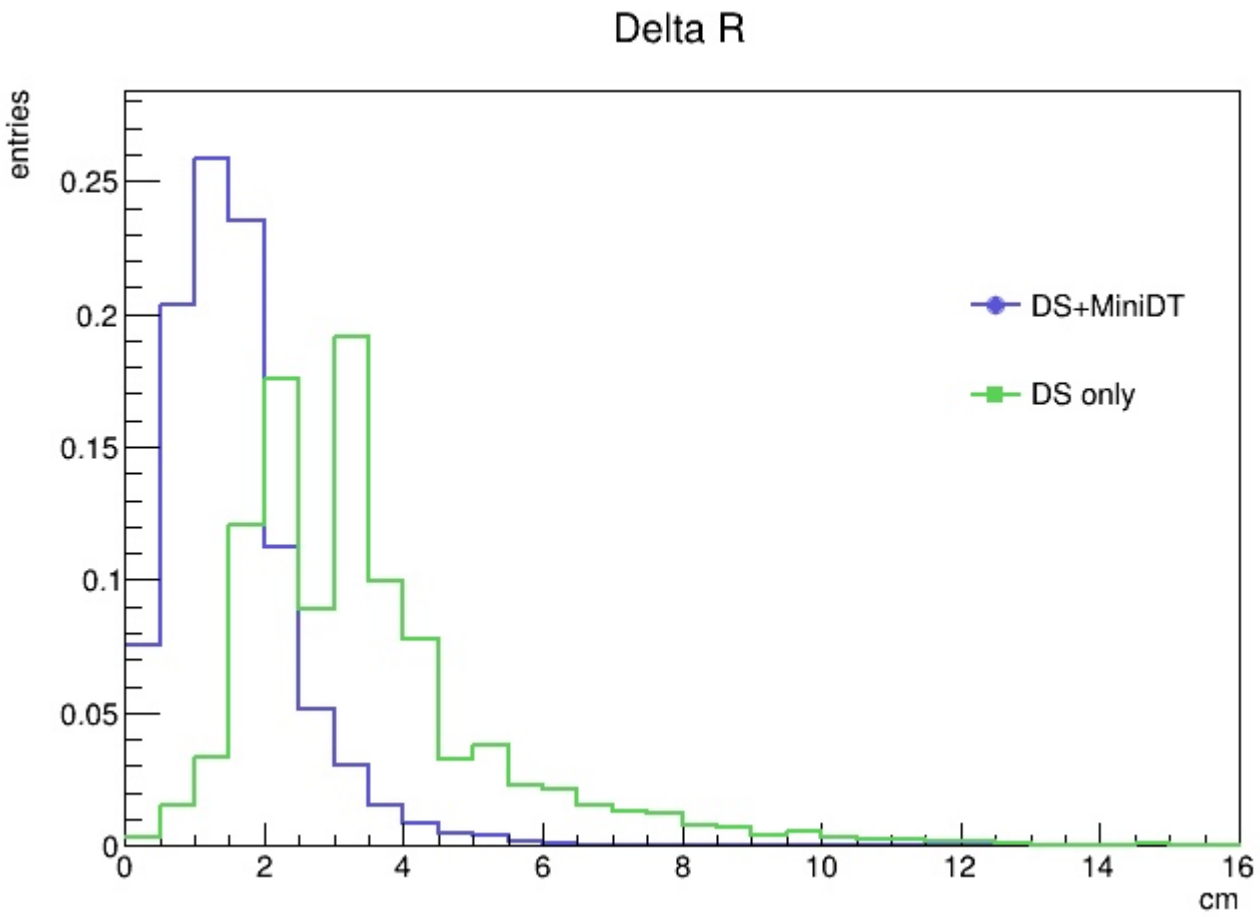




RED line: DS only – BLUE line: DS+MiniDT

Resolution difference

Where $\Delta R = \sqrt{\Delta x^2 + \Delta y^2}$

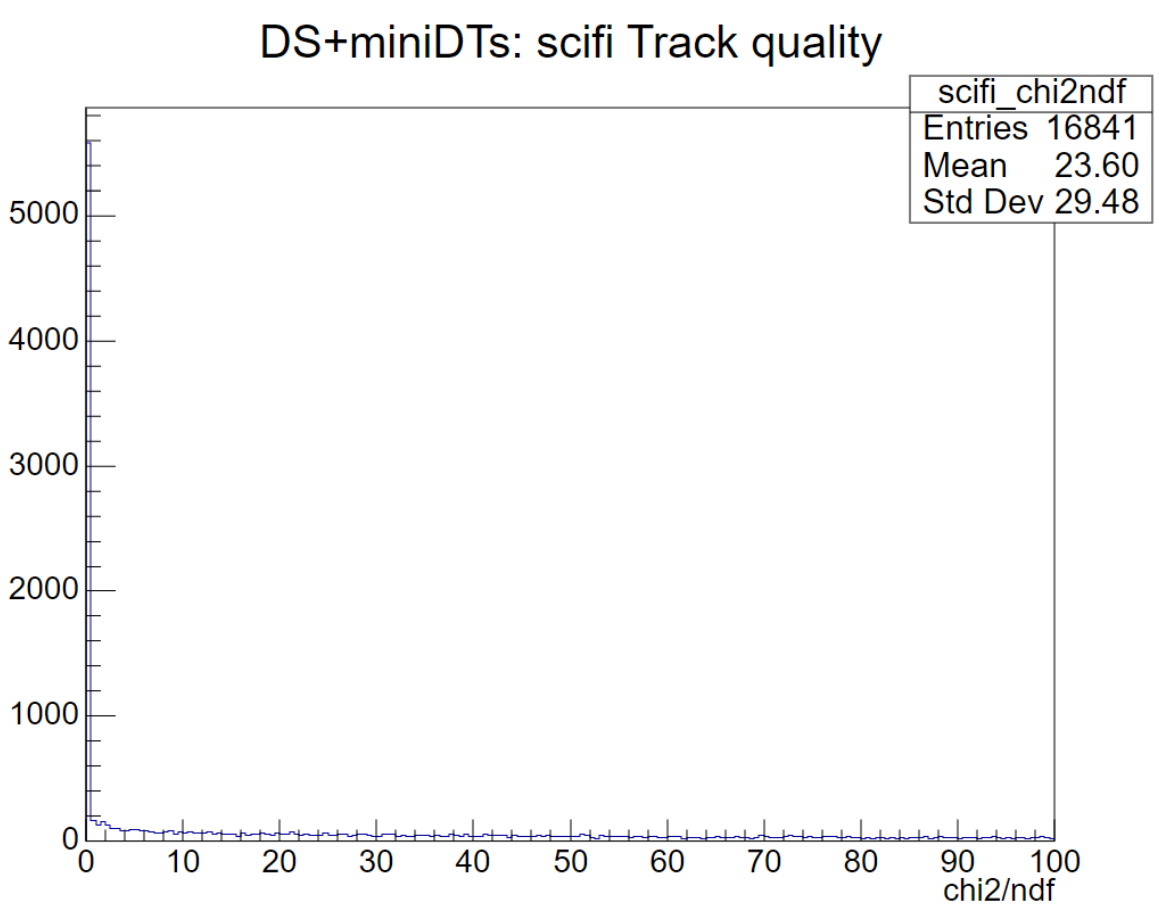


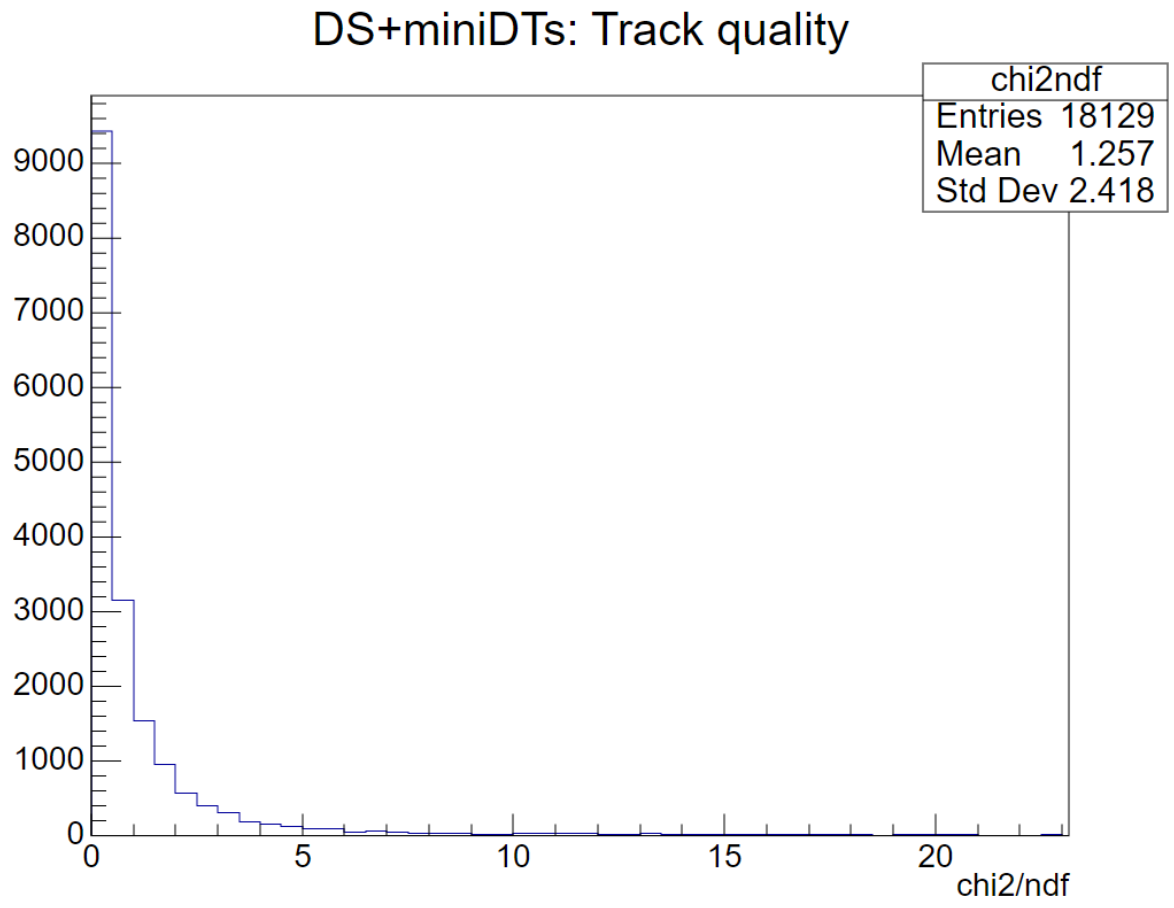
ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

Istituto Nazionale di Fisica Nucleare
Sezione di Bologna

THANK YOU

Chi^2


DS+miniDTs: scifi Track quality
scifi_chi2ndf
Entries 16841
Mean 23.60
Std Dev 29.48
5000
4000
3000
2000
1000
0
0 10 20 30 40 50 60 70 80 90 100
chi2/ndf


DS+miniDTs: Track quality
chi2ndf
Entries 18129
Mean 1.257
Std Dev 2.418
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
0 5 10 15 20
chi2/ndf