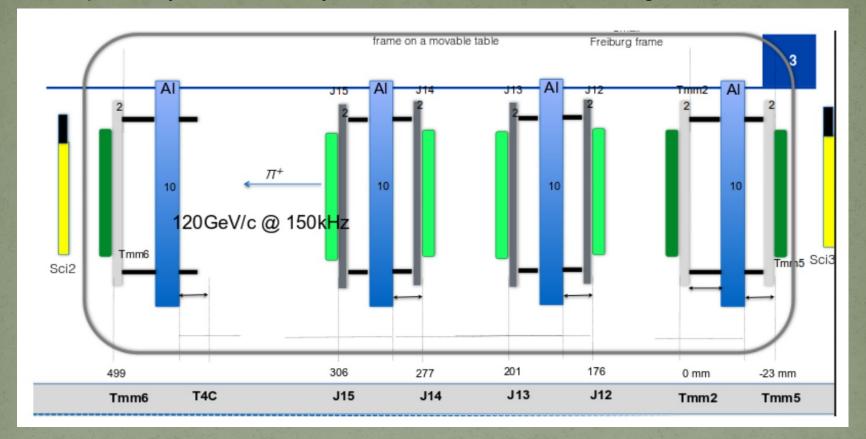
Main Purpose: Systematic study of J chambers at different angles: 0° - 10° - 20° - 35°



- J12-13-14-15: floating mesh chambers, dimensions 10 × 10 cm², 128 μm pillars
- Layout: 2 doublets of J chambers with same orientation: J14-J12 and J15-J13
- Settings:
- 1. Selected events with exactly 1 cluster
- 2. Applied Cross-Talk corrections plus a threshold on the strip charge of 3σ of the pedestals distributions
- 3. Clusters made of minimum 2 strips and maximum 2 consecutive holes

Main Purpose: Systematic study of J chambers at different angles: 0° - 10° - 20° - 35°

FIRST STEP Reproduce A. Betti results obtained with run 13058; the run we're using is 13057; from the logbook found on https://twiki.cern.ch/twiki/bin/view/Atlas/MicromegasTestBeams we read:

- Run 13058: HV Tmm=550/300, J=580/300, theta_J=35, theta_Tmm=25
 Position=(2.38, 3.44)
- Run 13057: HV Tmm=550/300, J=580/300, theta_J=35, theta_Tmm=25

By the way, what is the "Position" note about??

However, at the beginning of her talk on 3-12 we found:

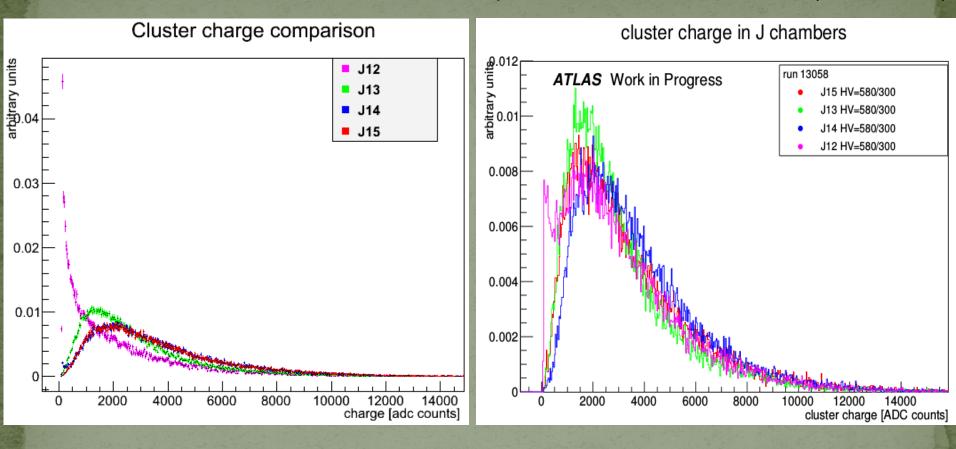
Selected good events with a track using the centroids of the telescope chambers (3 Tmm chambers at 0 degrees)

1st difference, since we set them at 25 as reported in the logbook

The second one is about the cluster choice, since there's this implemented feature:

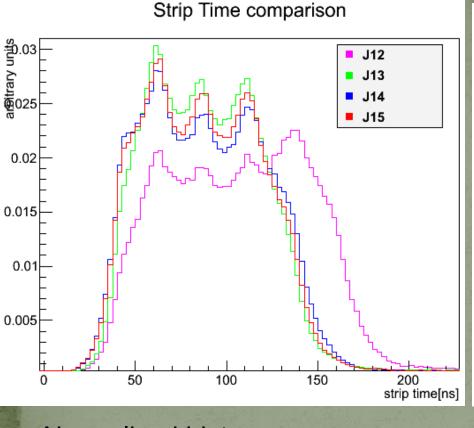
Analyzed the cluster that is the closest to the track in the analyzed chamber

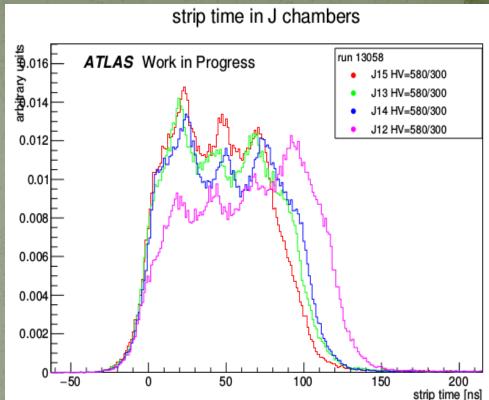
Run 13057: J chambers at 35° to be compared with A. Betti results (run 13058)



- Normalized histos...
- No cuts applied on charge...
- J12 chamber gives completely crazy results...
- If there're other changes, we don't know nothing about them...

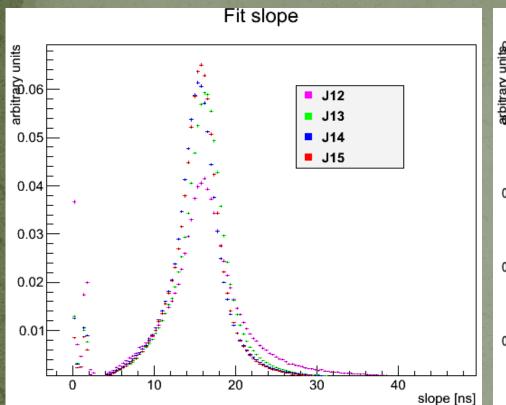
Run 13057: J chambers at 35° to be compared with A. Betti results (run 13058)

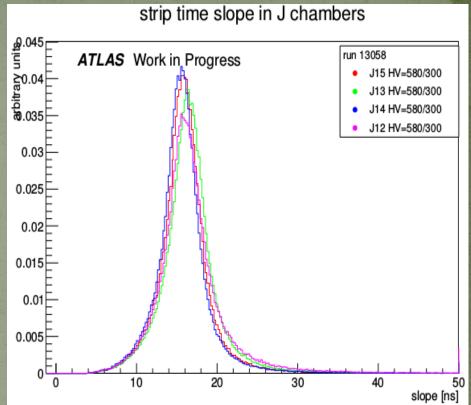




- Normalized histos...
- It seems to be a global shift in time, perhaps related to the value of T0: in our case the setting is T0=0. When we run M. Vanadia's code a T0 calibration file is produced; re-running the code once again with, forcing it to use the calibration file produced before, nothing changes since the setting is still T0=0...
 - Maybe they're using a user-defined T0 value or an offset someway related to it...

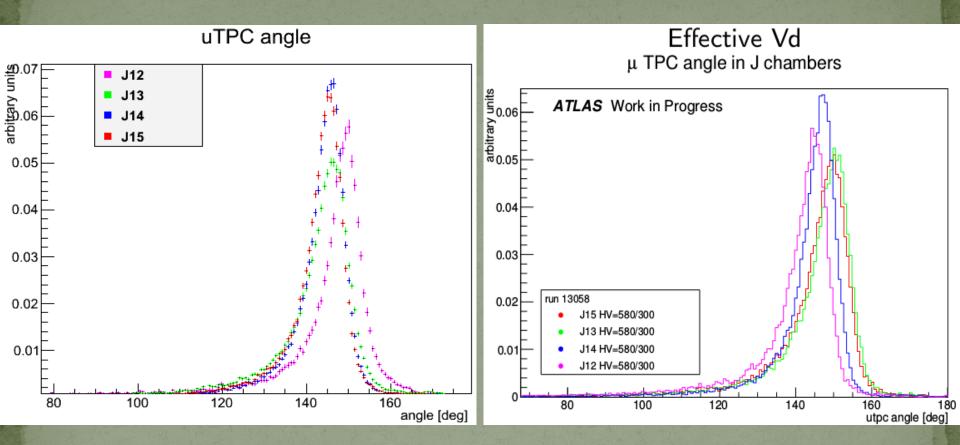
Run 13057: J chambers at 35° to be compared with A. Betti results (run 13058)



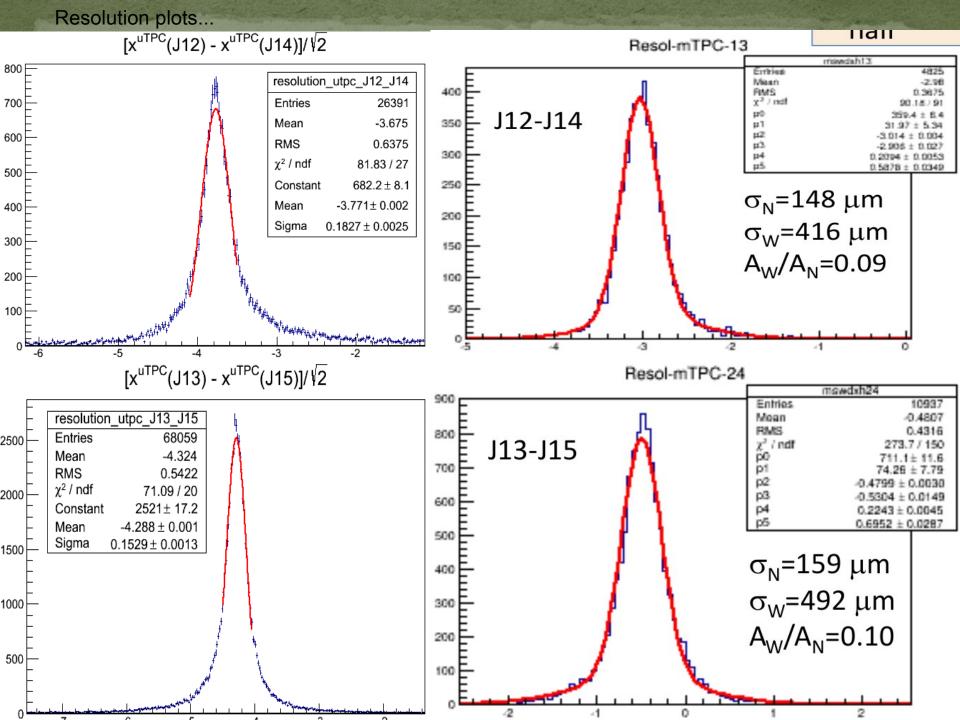


- Normalized histos...
- Here we have the plot of the slope, which comes from the fit with the Fermi-Dirac function... even in this case we have some points near the zero-value, which shouldn't be there...we wonder why...

Run 13057: J chambers at 35° to be compared with A. Betti results (run 13058)

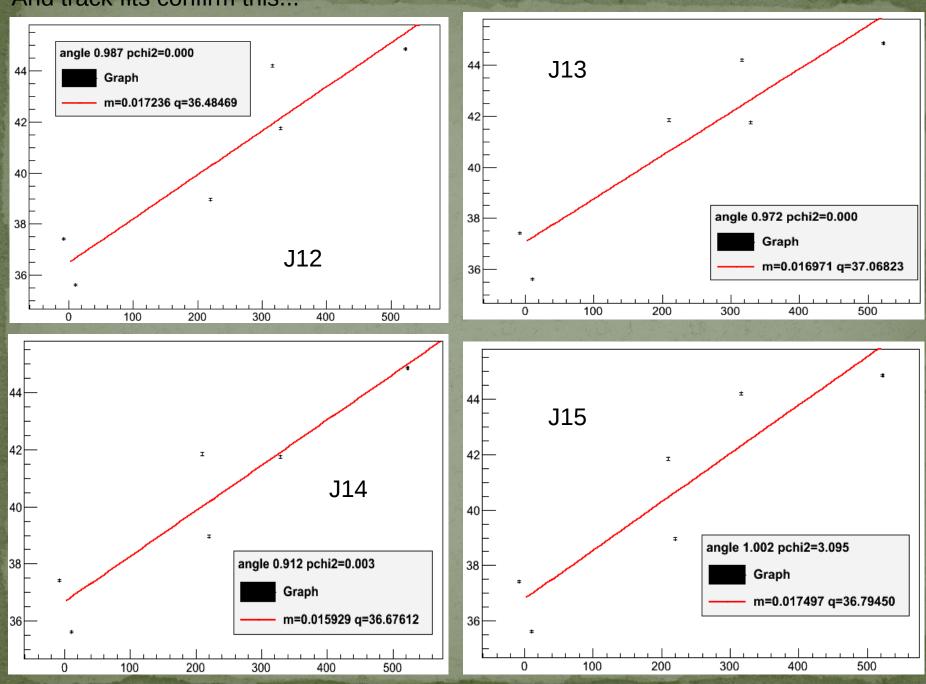


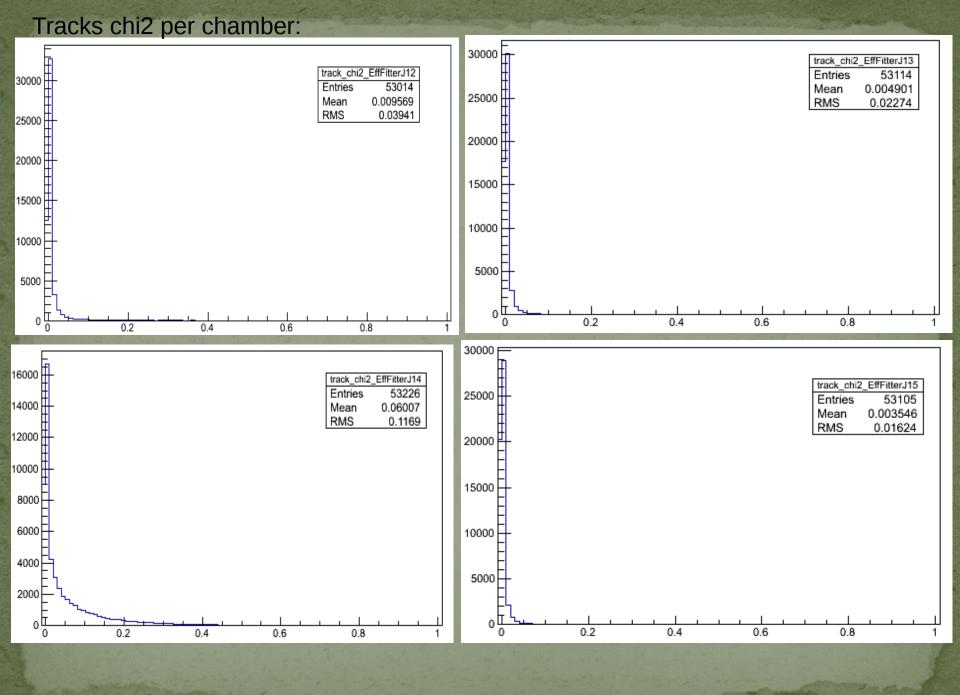
- Normalized histos...
- Here we have the reconstructed uTPC angle...chambers behaviour (apart from J14) seems to be reversed...



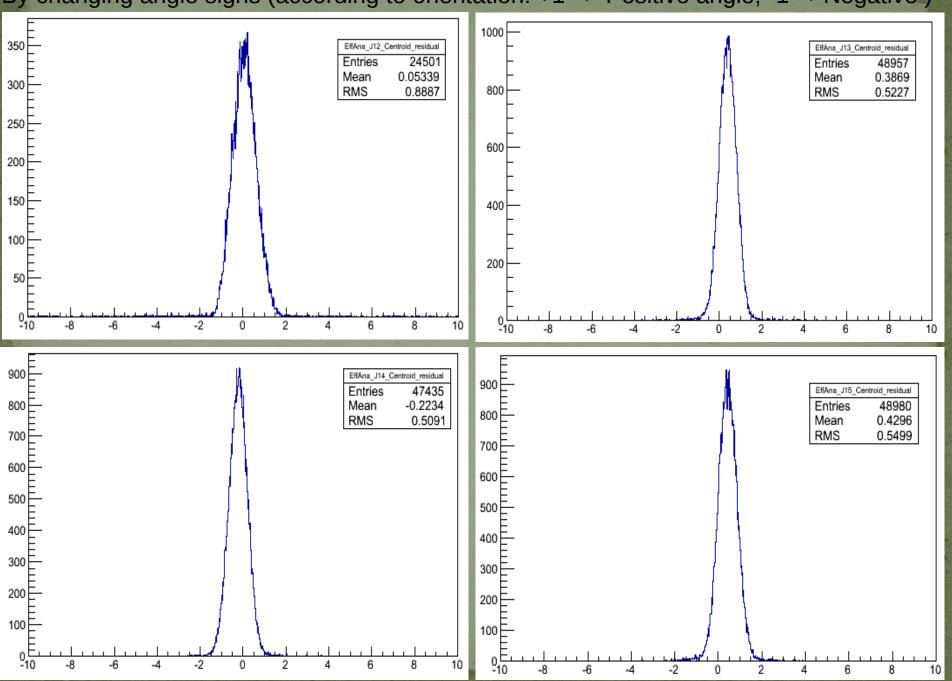
Residual plots show a chamber disalignment: EffAna J13 Centroid residual EffAna_J12_Centroid_residual 100 Entries 5204 4593 Entries Mean -0.7156 Mean 2.605 0.915 RMS 0.6154 RMS 60 40 20 4 6 500 EffAna_J14_Centroid_residual EffAna_J15_Centroid_residual 26169 Entries 3884 Entries 2.764 Mean -0.5345 Mean RMS 0.5102 RMS 0.6226 400 300 200 100

And track fits confirm this...

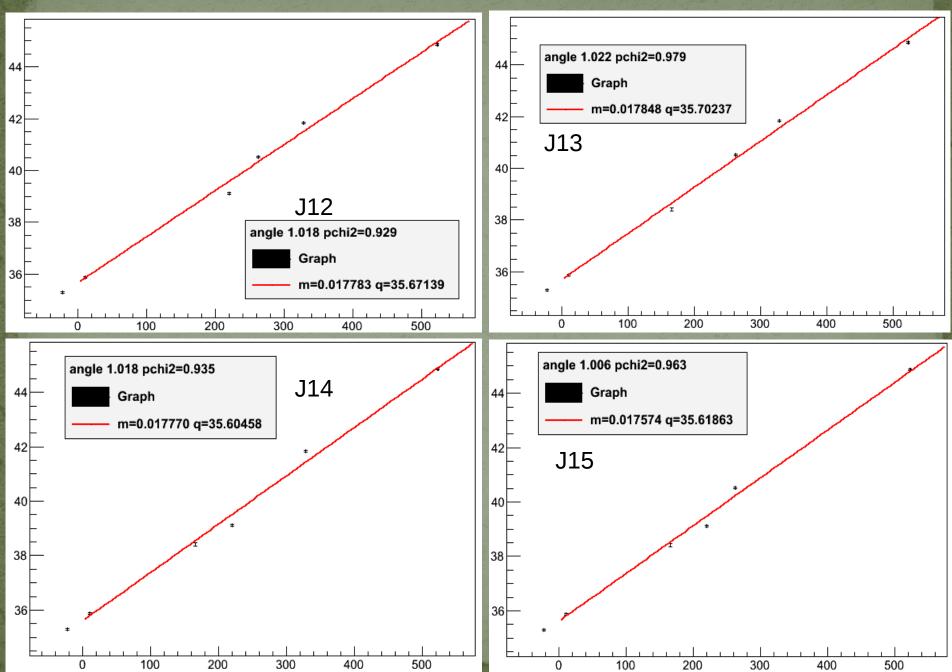




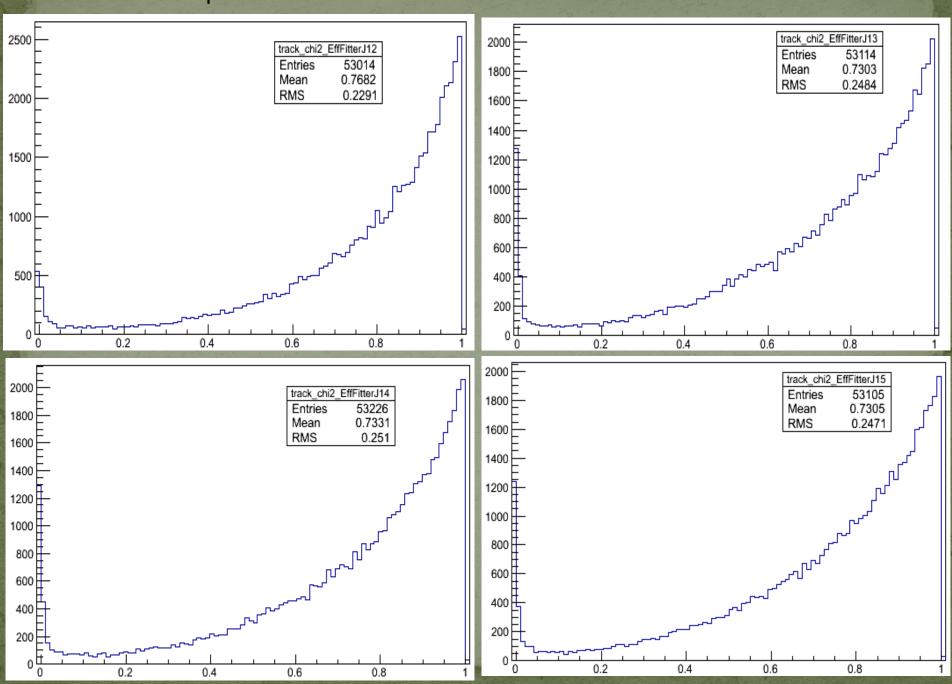
By changing angle signs (according to orientation: +1 -> Positive angle; -1 -> Negative)



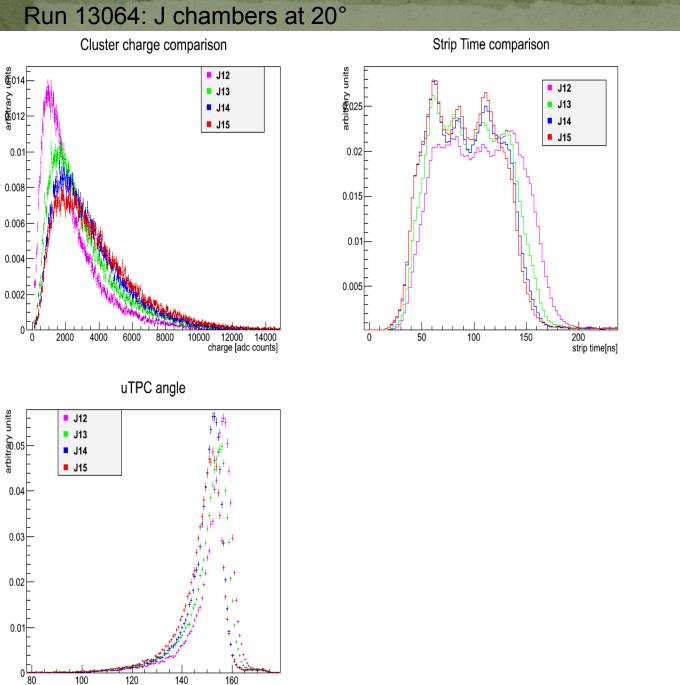
Also track fits is different...



Now tracks chi2 per chamber:



But resolution plots don't show big differences: LEFT before – RIGHT after $[x^{uTPC}(J12) - x^{uTPC}(J14)]/\sqrt{2}$ $[x^{uTPC}(J12) - x^{uTPC}(J14)]/\sqrt{2}$ 800 -800 resolution utpc J12 J14 resolution utpc J12 J14 26391 **Entries** Entries 26391 700 700 Mean -3.496-3.675Mean **RMS** 0.645 600 **RMS** 0.6375 χ^2 / ndf 46.57 / 24 600 Constant 694.4 ± 8.4 χ^2 / ndf 81.83 / 27 500 -3.604 ± 0.002 Mean 500 Constant 682.2 ± 8.1 Sigma 0.1751 ± 0.0026 Mean -3.771± 0.002 400 400 Sigma 0.1827 ± 0.0025 300 200 200 100 100 [x^{uTPC}(J13) - x^{uTPC}(J15)]/\² $[x^{uTPC}(J13) - x^{uTPC}(J15)]/\sqrt{2}$ resolution utpc J13 J15 resolution_utpc_J13_J15 **Entries** 68059 2500 2500 68059 Entries -4.324Mean -4.283Mean RMS 0.5422 χ^2 / ndf RMS 0.5389 71.09 / 20 2000 2000 χ^2 / ndf 60.23 / 19 2521± 17.2 Constant 2530 ± 17.4 Mean -4.288 ± 0.001 Constant Sigma 0.1529 ± 0.0013 1500 Mean -4.249 ± 0.001 1500 0.1515 ± 0.0014 Sigma 1000 1000 500 500



angle [deg]

Fit slope

J12

J13

J14

J15

20

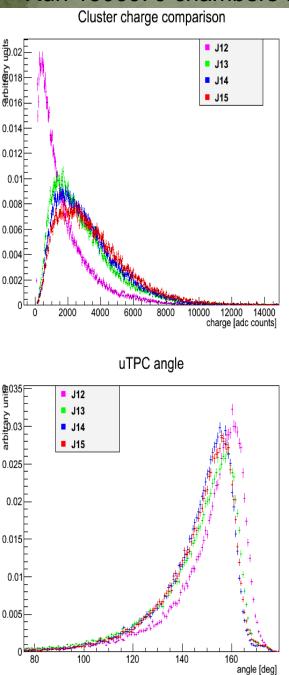
50 slope [ns]

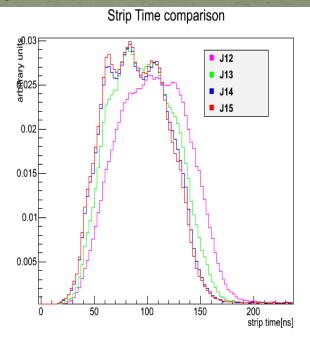
0.03

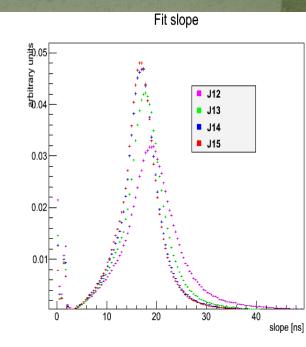
0.02

0.01

Run 13069: J chambers at 10°







Run 13026: J chambers at 0°

