Measurement of Lorentz angle for Silicon Strip Detector

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- We have started our analysis on old data and that has been completed in a sence that the old data file is unable to provide **1.** information of drifts in both x and z direction in local sistrip and **2.** also LA plots for TID and TEC could not be extracted. As a reminder two plots, TOB shows a bump near zero probably a mixup of statistics of different **B** orientation, without drift information which can not be separated out.
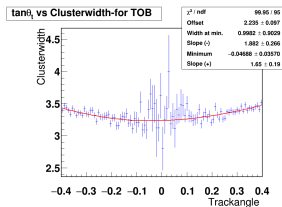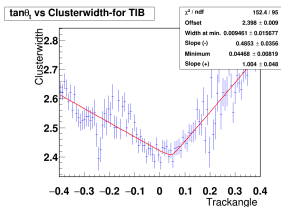

(a) ve^{+} z and **E** for TIBL3, 2.55^{0} (b) ve^{+} z and **E** for TOBL4, -2.68^{0}

- These reasons motivates to book new data with necessary variables for the purpose of getting LA's for all subdetector and corresponding parts(layer, rings) and also to separate statistics for those same.

- As centrally produces calibration trees does not contain variables needed for the calculation of LA, we moved to book a private one (not with full(??) statistics). A note has been circulated in DPG group.

Few variables has compared in the both data files to get a surity that the nature of variables are same. **Comparison of data(old and new) points for projection of magnetic field in local y-1, θ of trajectory, local-ϕ-3, pseudorapidity-η-4**
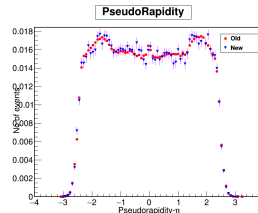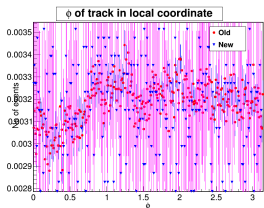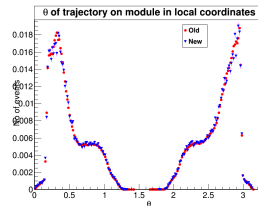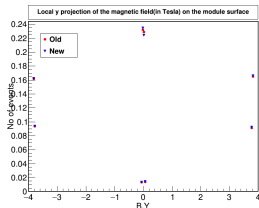
Method which has been used is being called width method as it **measures trackangle as Lorentz angle at minimum clustersize**. Stereos are tilted by 100 mrad wrt mono detectors, need to be corrected. Tracker subdetector diary,

- **TIB: 4L, $|z|$ <65cm, t=320μm, sp-(80-120)μm, F2L-stereo(r-ϕ,r-z), N2L-Mono, SPR-(23-34) μm.**
- **TOB: 6L, $|z|$ <110cm, t=500μm, sp-(120-180)μm, F2L-stereo(r-ϕ, r-z),N4L-Mono, SPR-(35-52) μm.**
- **TEC: 9D, modules arranged in Rings, 120cm< $|z|$ <280cm, 2IM+5th R-stereo(r-ϕ, r-z), t=3IMR 320μm;rest 500μm.**
- **TID: 3D, F2R-stereo, t=320μm, fill the gap between TIB and TEC.**

So it is expected there would be 6(TIB), 8(TOB), 12(TEC), 6(TID)=32 plots for LA corresponding to diffrent detectors and layers, wheels etc.

Separation of statistics using the helperclasses TIBDetId.h, TOBDetId.h, TIDDetId.h,
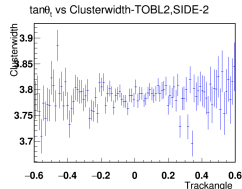
TECDetId.h, DetId.h has been done for new data.

These helperclasses consumes information of layers, wheels, rings and sides. We have extracted the corresponding detectors id's using these helper classes.

Irrespective of expected **V** curve and fitting we have been **separated statistics for TIB, TOB, TID and TEC.**
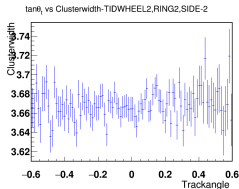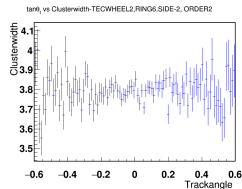Side 1-Ve+, 2-Ve-
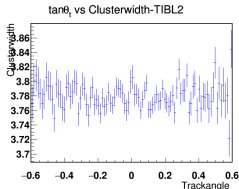
(a) TIB layer layer 2, side 1

(b) TOB Layer 2, side 2

(a) TID Wheel,Ring,side all 2

(b) TEC, wheel 2, ring 6, side 2

- We have succeeded to separates statistics for different layers and wheels etc., and as example we have shown this in the previous slides.
- Instead of having **"V"** curve we are having flat data points, we have to find out what is the reason of that.
- We have been produced our private ntuple based on MINIAOD's
  - **/store/relval/CMSSW_8_0_0/RelValTTbar_13/GEN-SIM-RECO/PU25ns_80X_mcRun2_asymptotic_v4-v1/10000/42D6DF66-9DDA-E511-9200-0CC47A4D7670.root**
  - **store/relval/CMSSW_8_0_0/RelValTTbar_13/GEN-SIM-RECO/PU25ns_80X_mcRun2_asymptotic_v4-v1/10000/42D6DF66-9DDA-E511-9200-0CC47A4D7670.root**

  We are also moving to book ntuple with recent data with higher statistics.

- We also have to separate data points for stereos and non stereos, spliting of statistics according to **E** field bias direction.
- Also we have to check for which modules Lorentz shift will happen in the same direction.