

Track Quality and Alignment Validation

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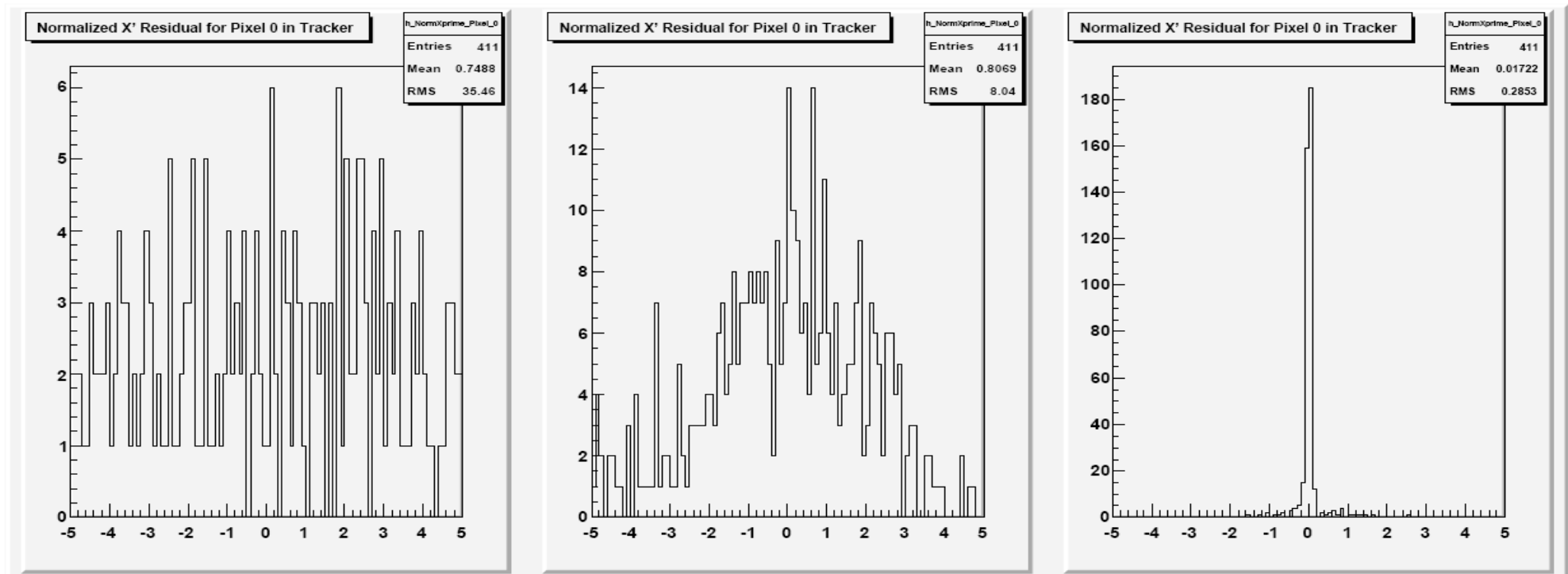


Outline



1. APE included in TrackerOfflineValidation tool
 - Pixel studies (Boris Mangano)
2. Fit/FWHM to estimate width of residuals
 - Investigation of non converging residuals
3. Validation of CRAFT
 - Comparison tracking algos / ctf outlier problem from CRUZET4
 - MP alignment object

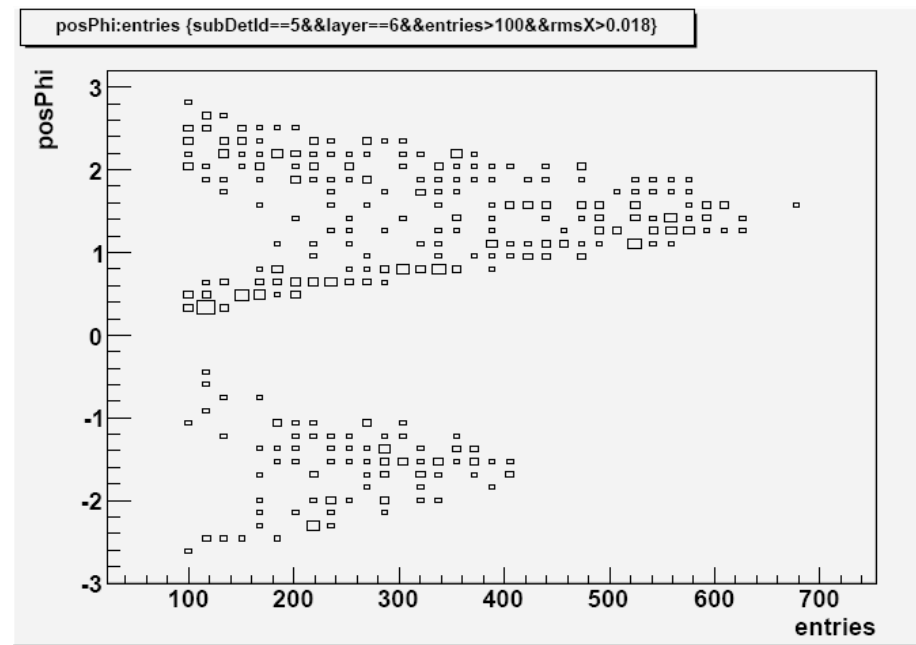
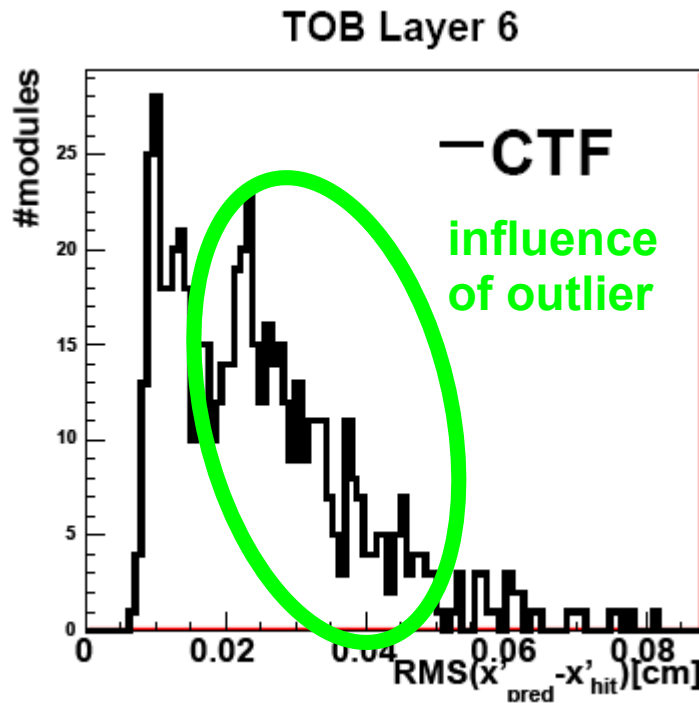
- First reconstruction of CRAFT data → very few pixel hits
- APE inflated to ?mm → private reconstruction (BorisMangano)
- Pulls of pixel residuals without/partially with and with APE
 - Option (useCombinedTrajectory) old setup
- Same results for new and old implementation if $APE = 0$



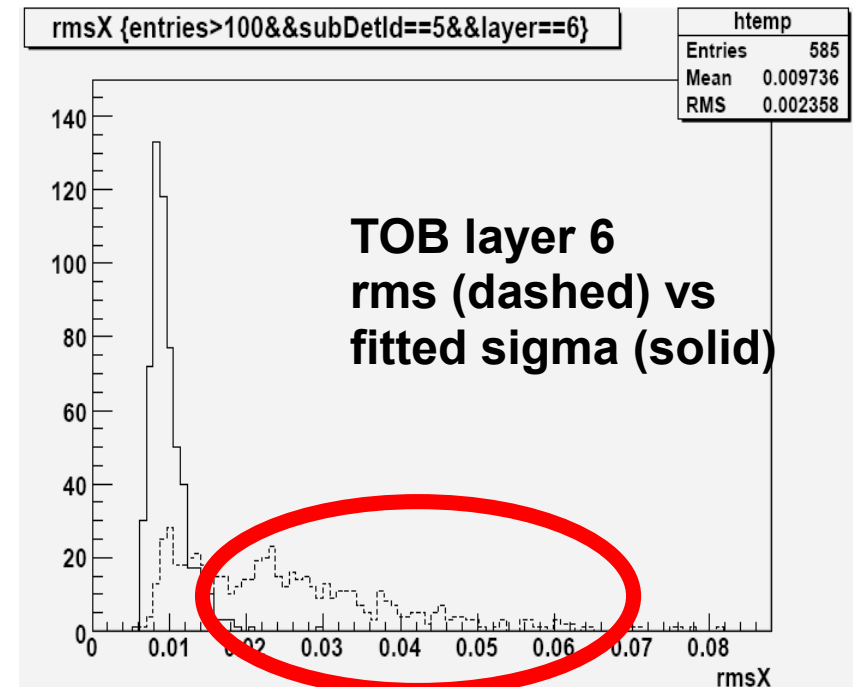
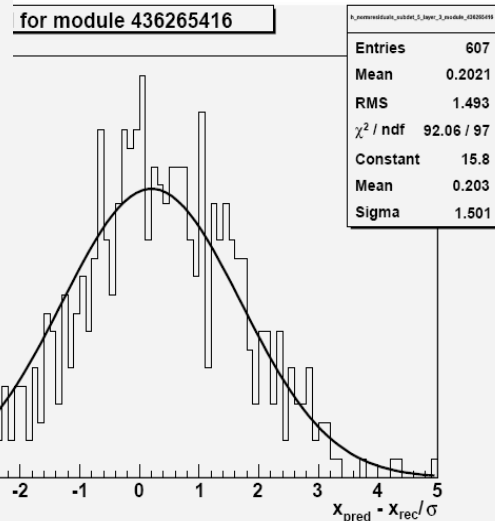
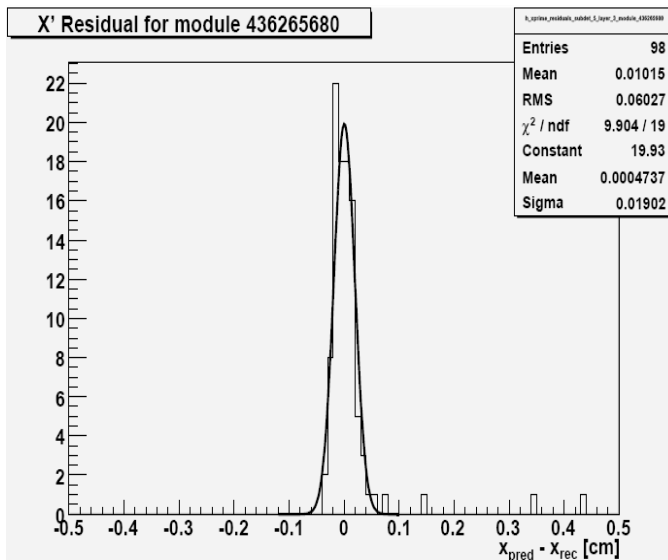


Reminder:

- large number of outliers in TOB outer layers
- Especially in upper detector half: seeding layers
- Gaus fit to estimate residual width



- **Outlier treatment in outer TOB layer → Gauss fit in 2 steps :**
 - First fit around mean of histogram, fit range 2 x RMS of histogram
 - Second fit around mean of first fit, fit range 2 x sigma of first fit

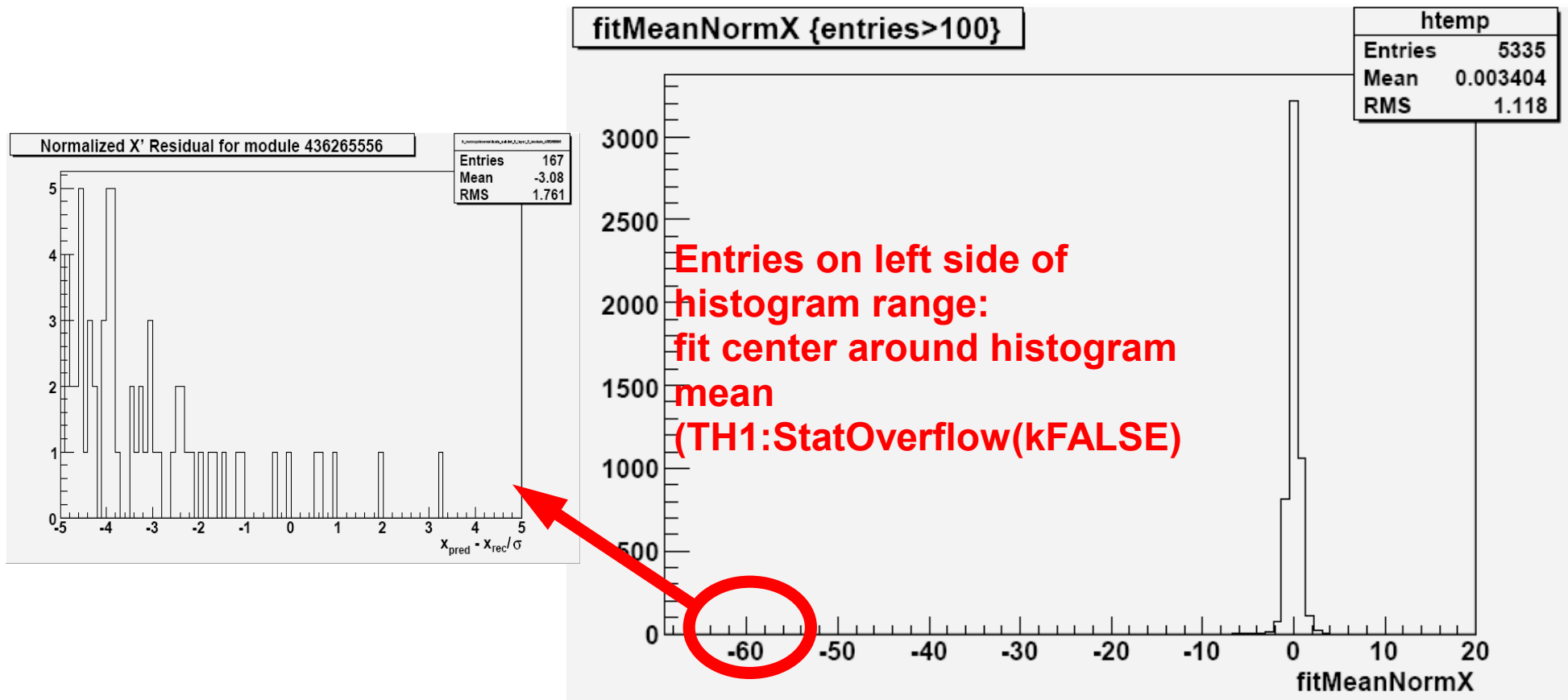


→ large improvement in absolute residuals, small influence on normalized residuals

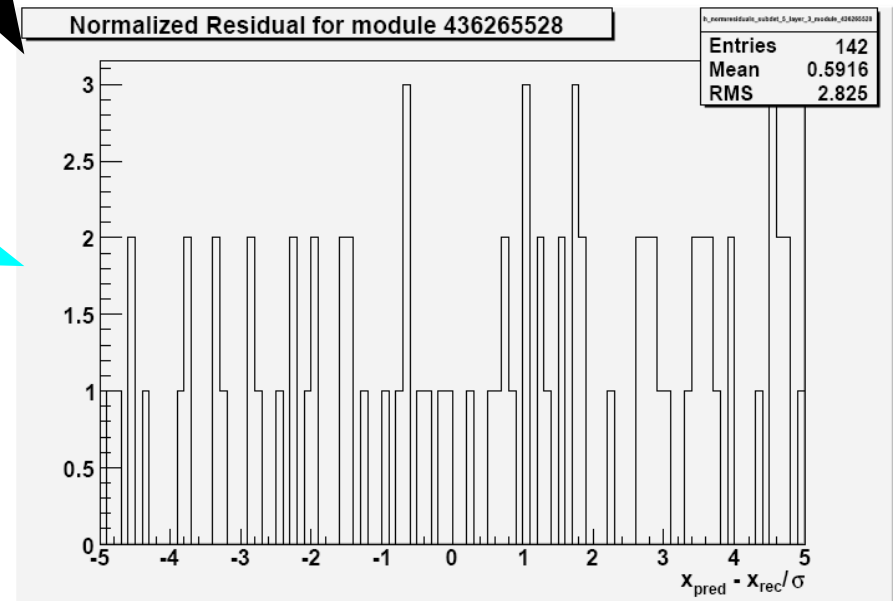
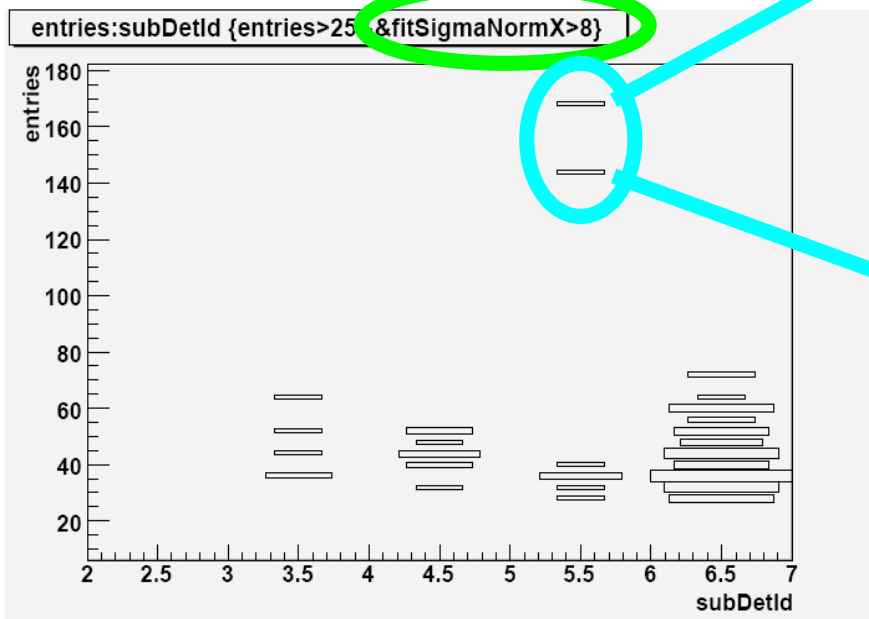
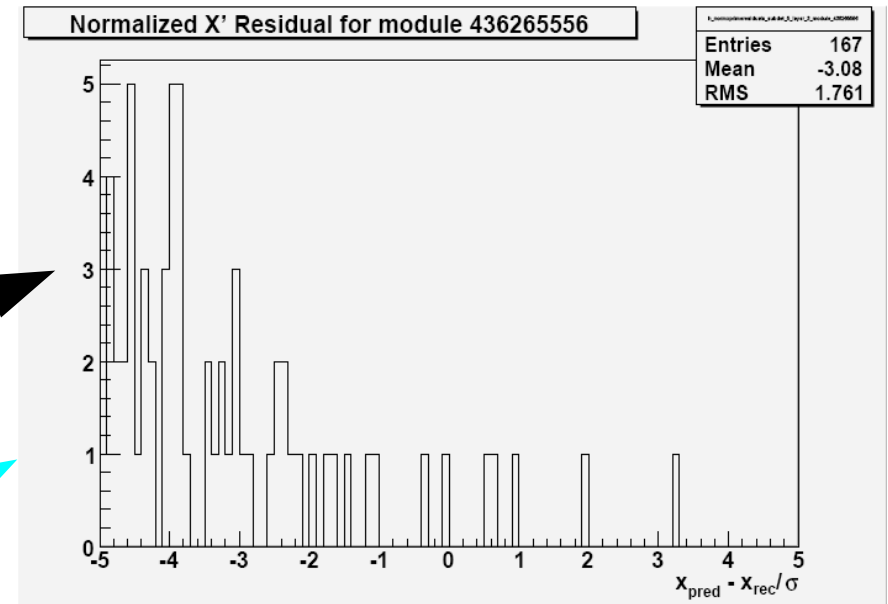
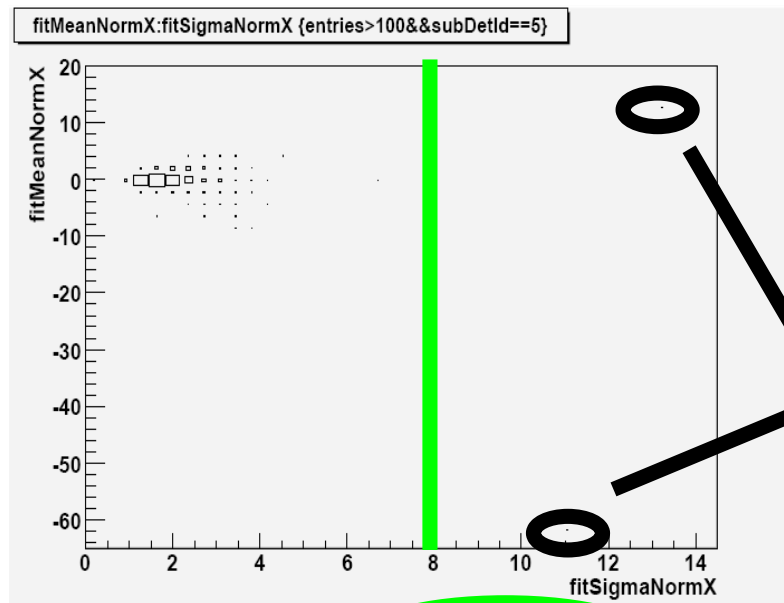
→ Fitted width more independent of outlier

Convergence of all fits!

Investigate 'outlier' modules : `fitMeanNormX < -60`



Use fit result to locate bad modules



Use χ^2 PerDof as discriminator

- Additional tree variable: χ^2 perDof
- Outlier modules same as found with fit method

