Update on Tracker Simulation

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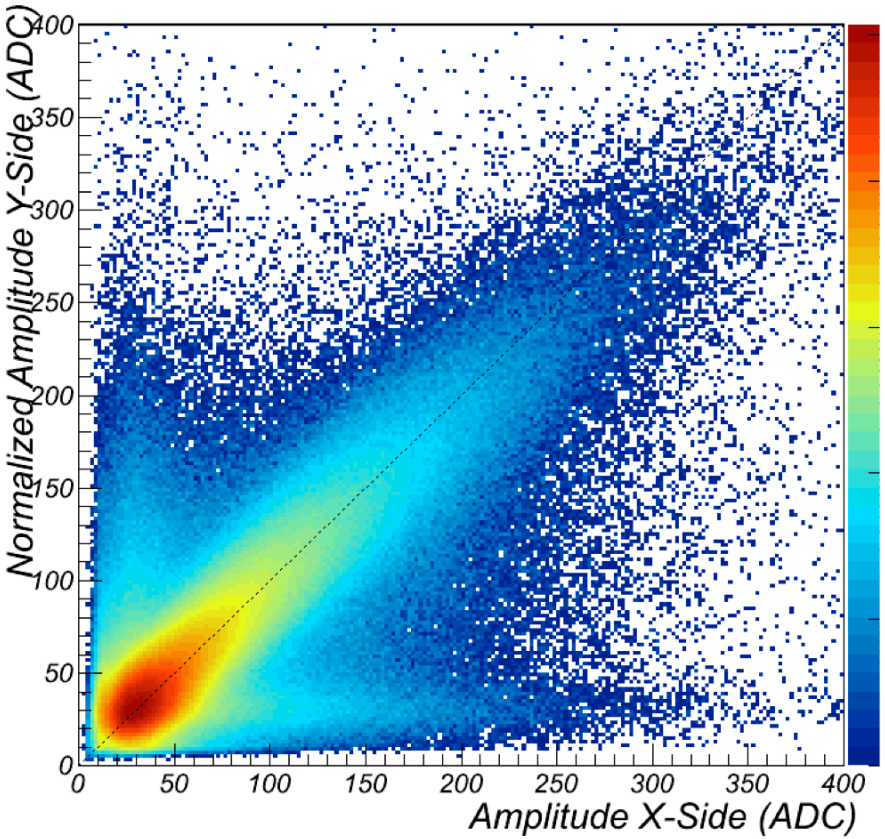
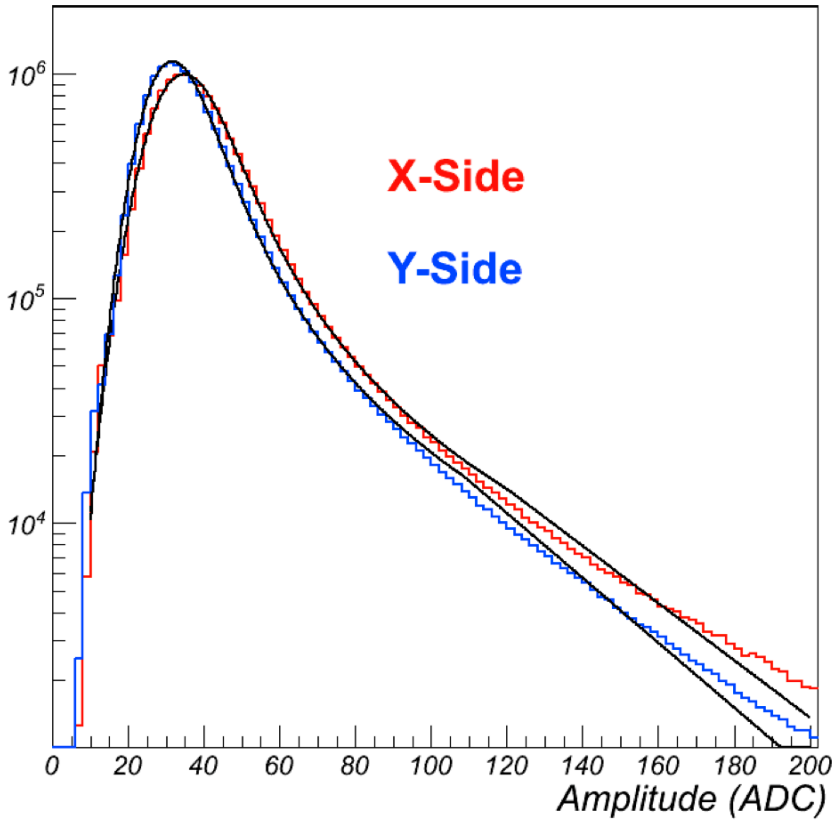
> New Tracker Parameter Database (KSC Data)

> Tracker Ladder Efficiencies

> Simulation Tuning with TB data (on going …)

CR @ KSC, 11 Sep 2010





Signals are corrected for:

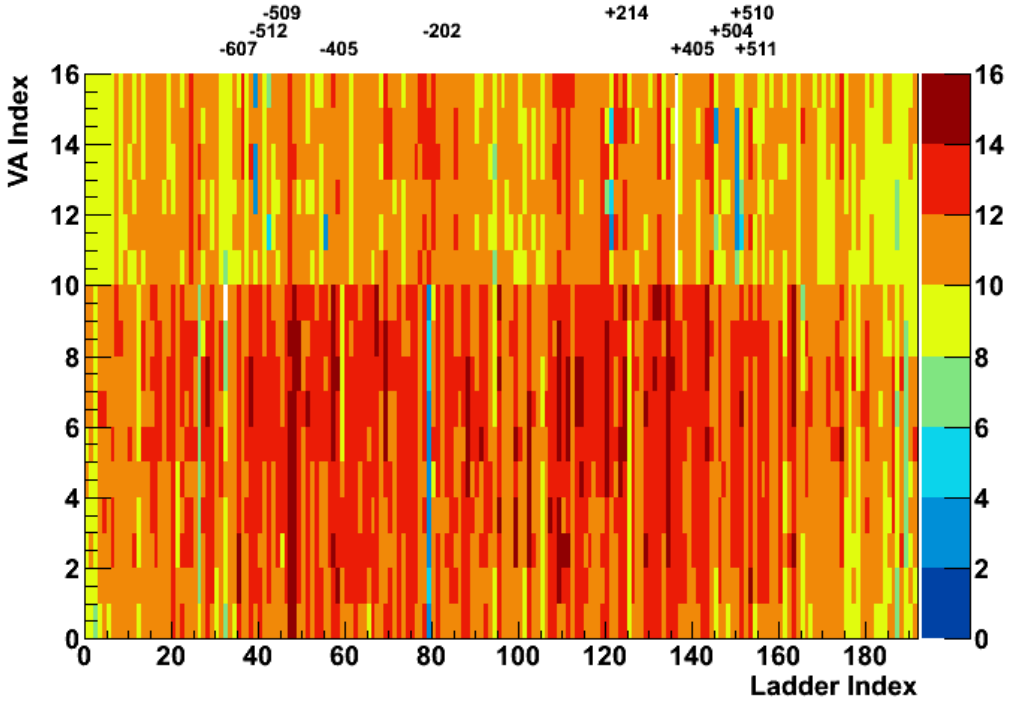
→Asimmetry (seems negligible)

→Gain (VA and ladder)

→Angular dependence

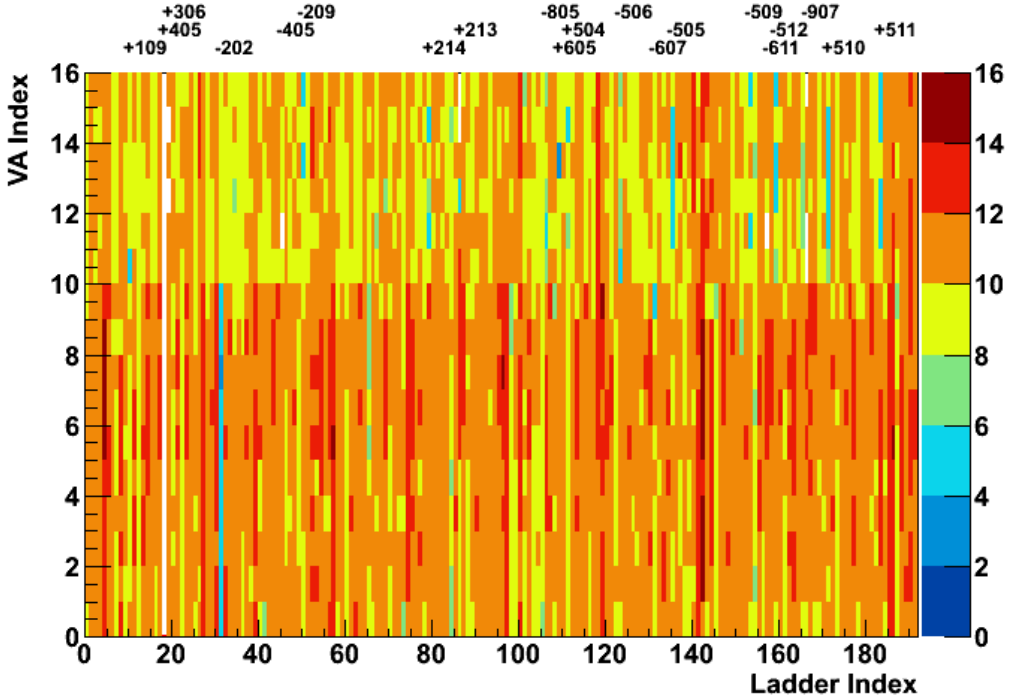
→Charge loss

Tracker Signal/Noise VA by VA



CR @ CERN, 22 Dec 2009, 100k tracks

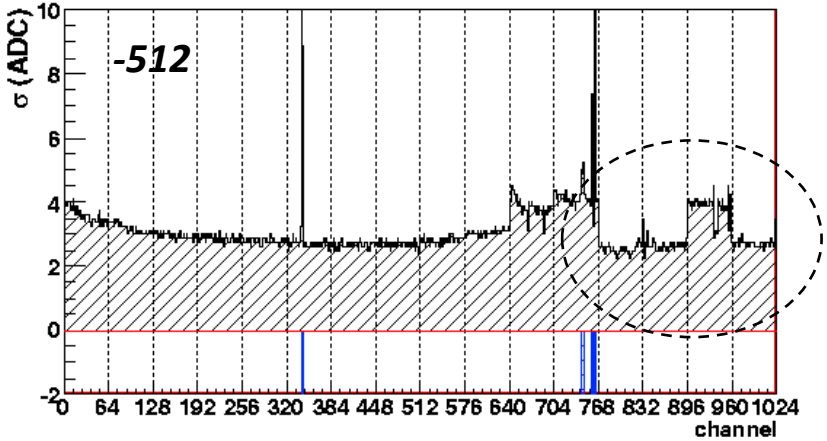
Average signal per VA (mean value)
Average noise per VA (of good strips)

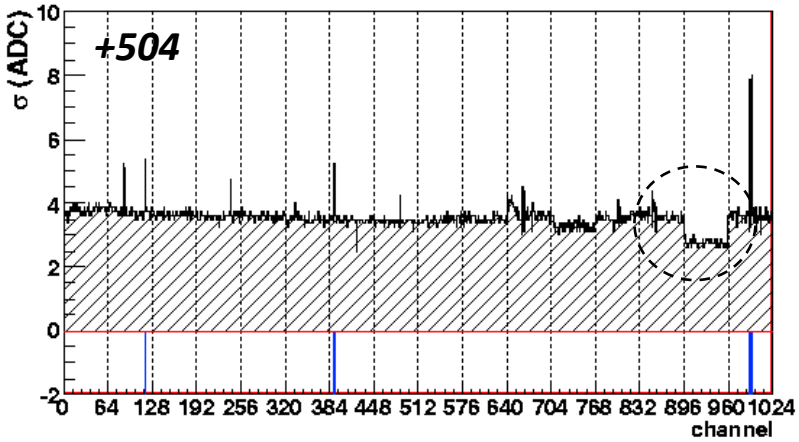


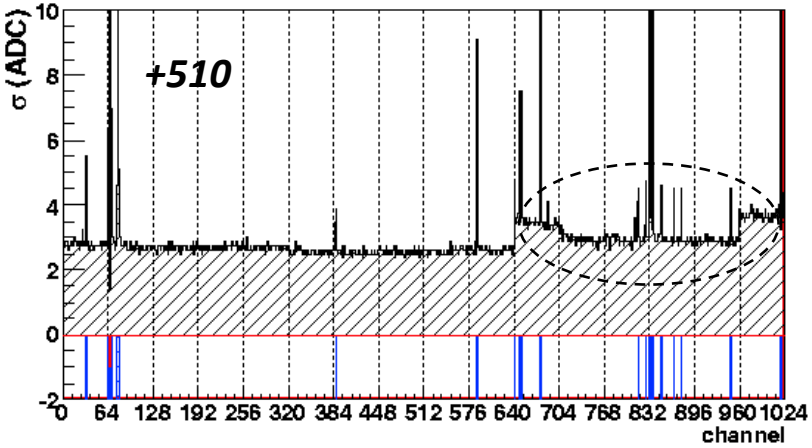
CR @ KSC, 11 Sep 2010, 200k tracks

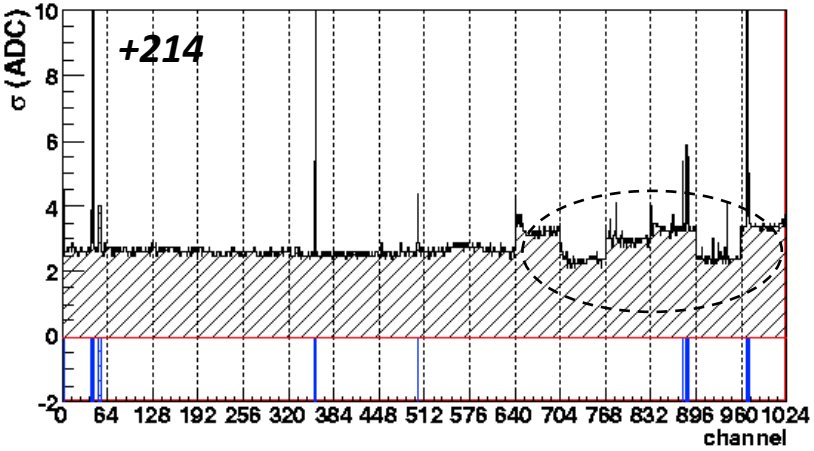
MPV signal per VA (from fit)
Average noise per VA (good strips)
Few Vas are masked (see next page)

The -512, +504, +510 and +214

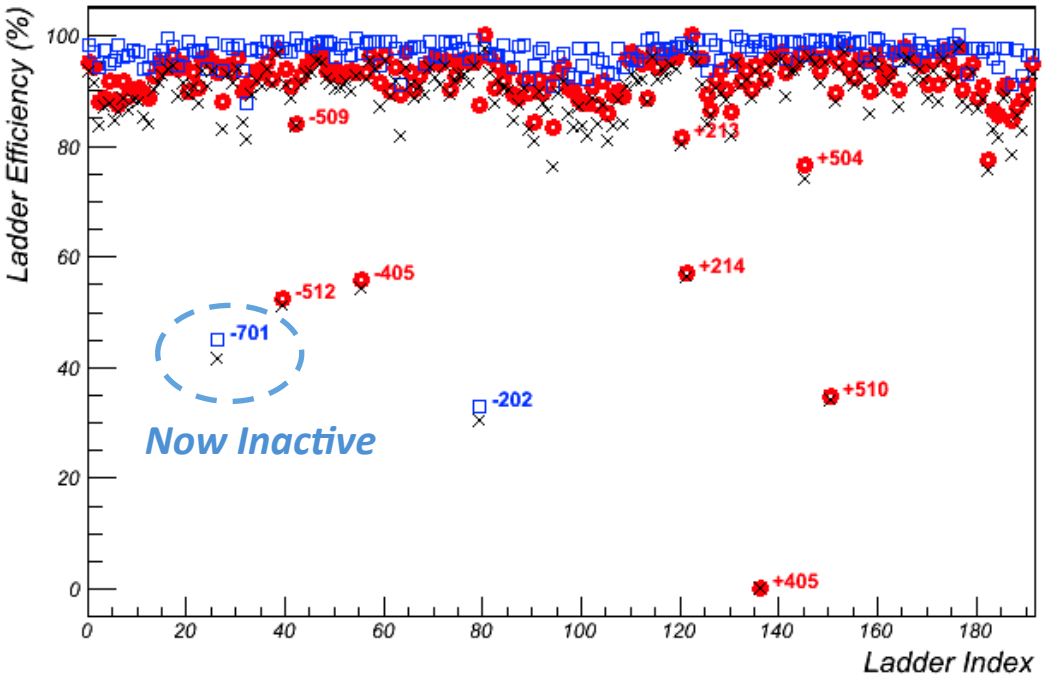






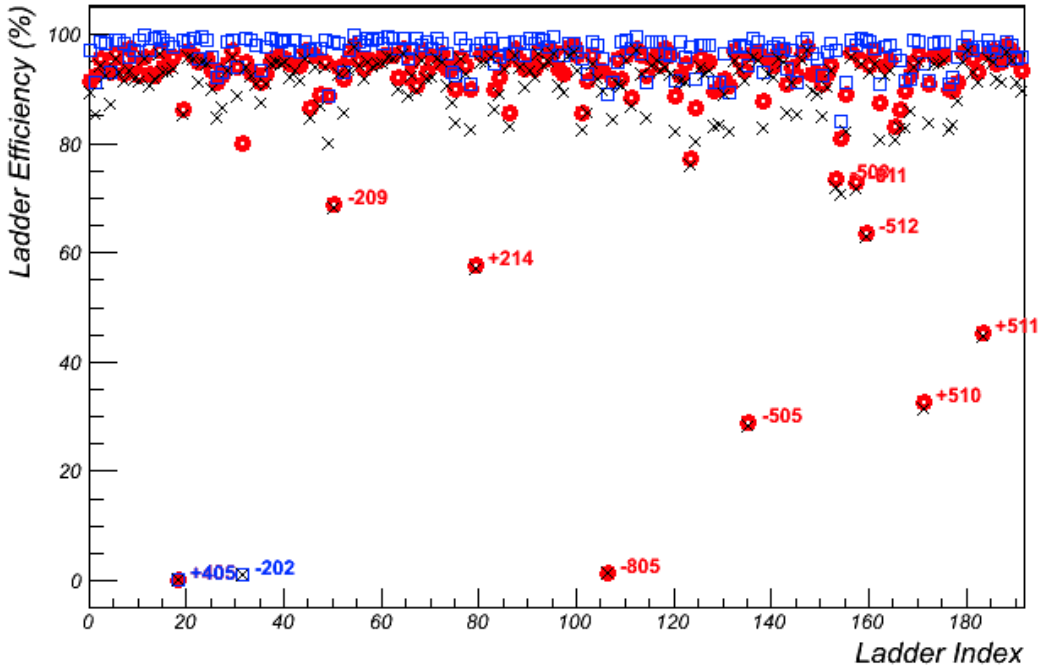


Ladder Efficiency



CR @ CERN, 22 Dec 2009, 100k tracks

(x) Hit Efficiency 91%
(*) X-Side Efficiency 93 % (5 bad eff.)
(*) Y-Side Efficiency 97 % (2 bad eff.)

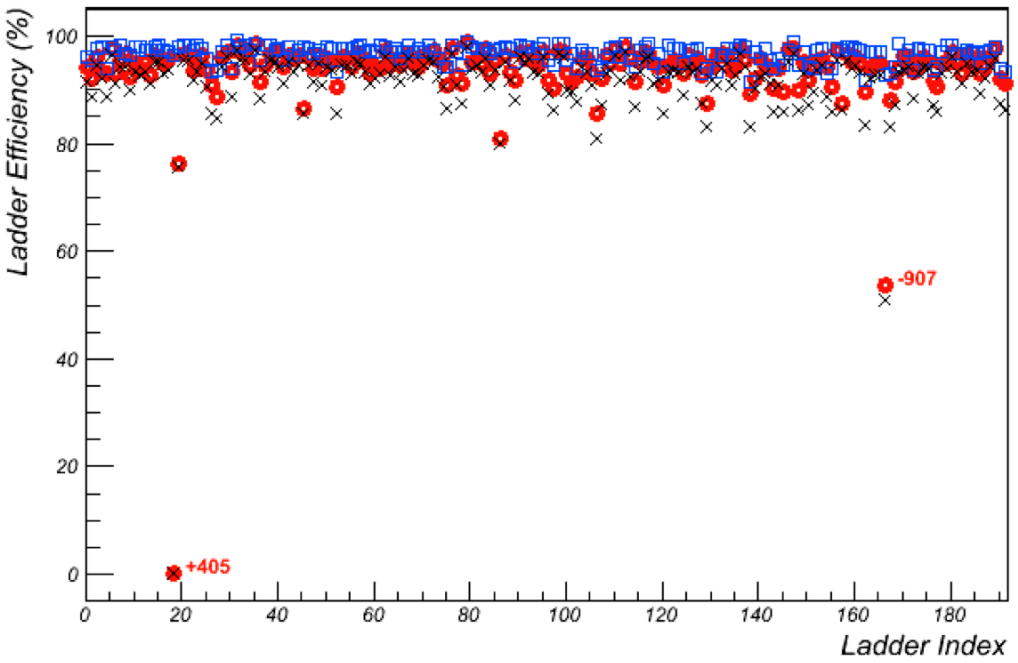


CR @ KSC, 11 Sep 2010, 200k tracks

(x) Hit Efficiency 91 %
(*) X-Side Efficiency 93% (8 bad eff.)
(*) Y-Side Efficiency 97 %, (2 bad eff.)
(+405 has an offline problem)

Ladder Efficiency Simulation

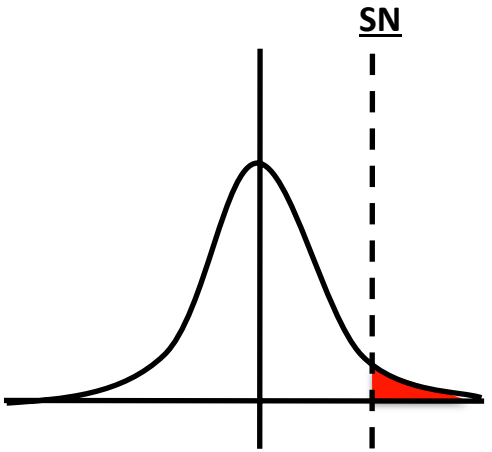
> New Calibration
> New Tracker Parameter Database (KSC Data)
> New Noise Simulation (faster)



(x) Hit Efficiency 92 %
(*) X-Side Efficiency 94 %
(*) Y-Side Efficiency 97 %

OK … but some effect is still missing

The Noise Simulation



Approach 0:

→ *196608 strips signal generated*
→ *Perform DSP data reduction*

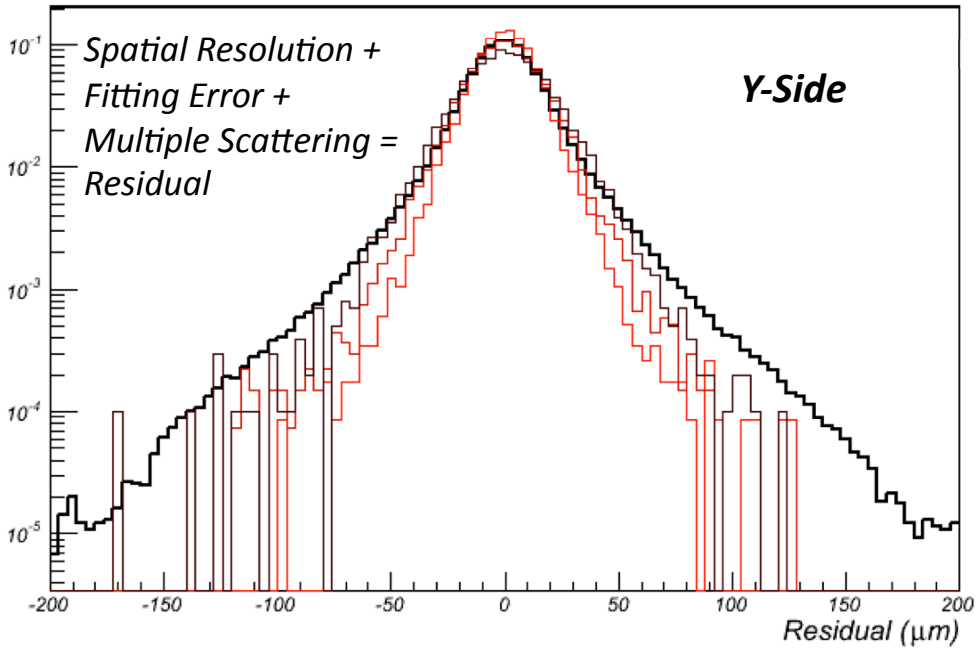
Approach 1 (default):

→ *Generate strips only on ladders with signals*
→ *Extract n fake seed strips (according to the DSP reconstruction threshold)*
SN = 3.5 n = 46
SN = 4 n = 6
→ *Extract strips around the cluster (second threshold)*
→ *Extract ladder and position*

Approach 2:

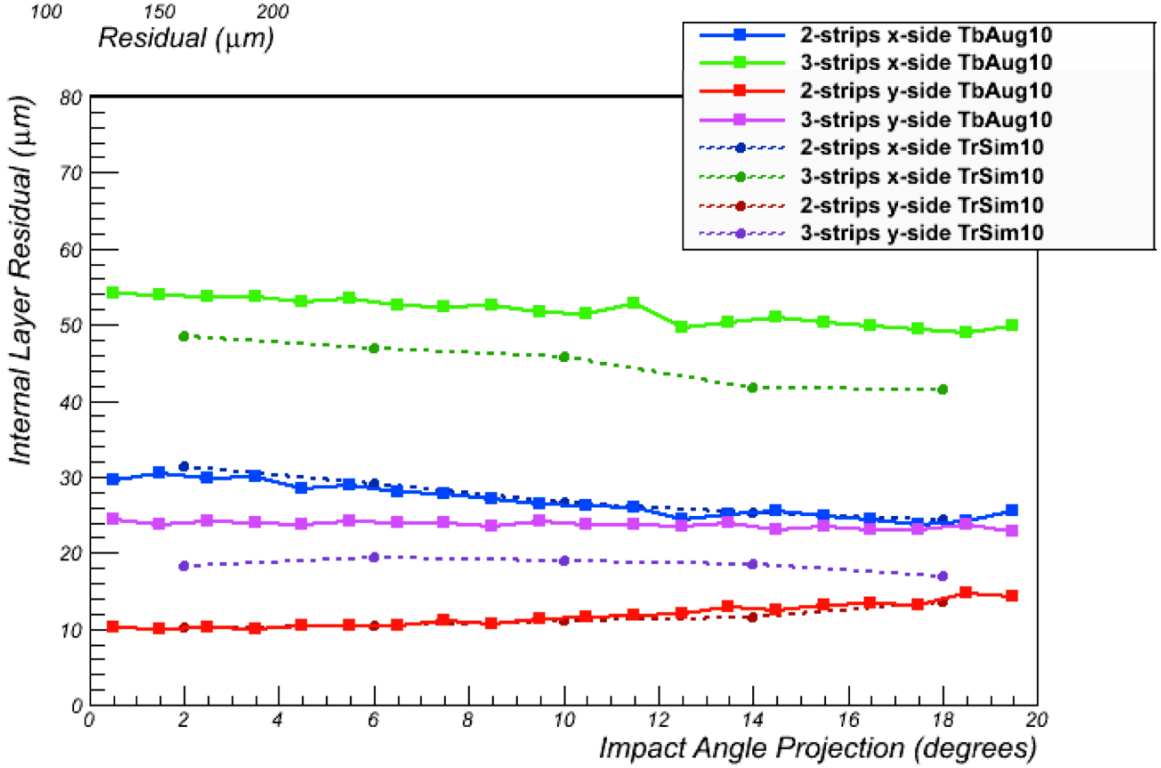
→ *Generate noise only around a cluster*
→ *Extract n fake clusters on all the Tracker (following approach 1)*

Test Beam Data Tuning



> Beam Test Data (400 GeV p, small MS)
> MC, several models

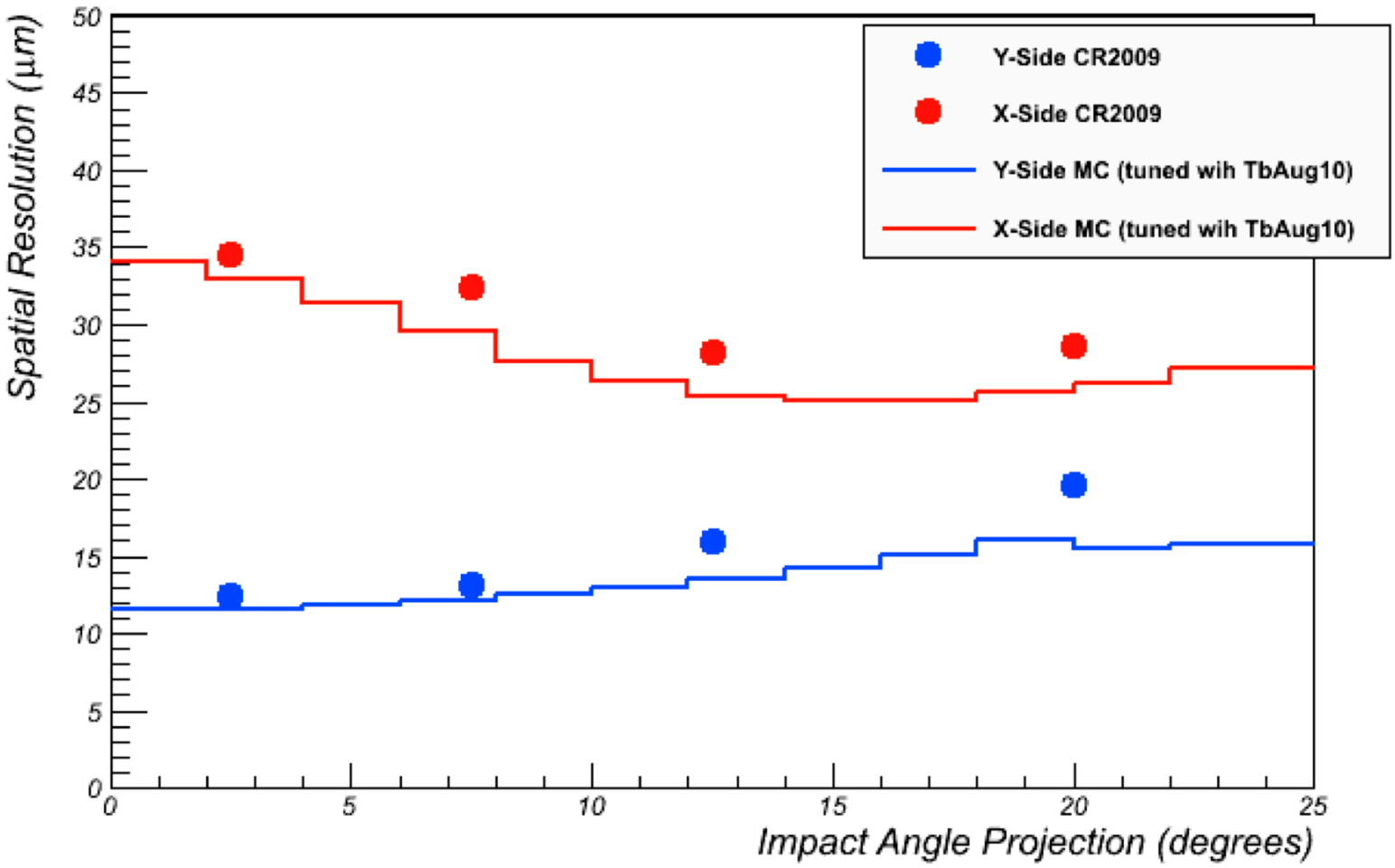
Comparison of residuals of internal layers (less fitting error)



Characteristic value and shape: OK

3-strip evaluation (used only for high angles) has to be checked

Spatial Resolution: Data and MC



Conclusion

The simulation is in a good shape!

> Few more check needed to fully validate it (noise and efficiency tuning)
> Needed a slightly better description for high angles
> Check the Z>1 particles resolutions