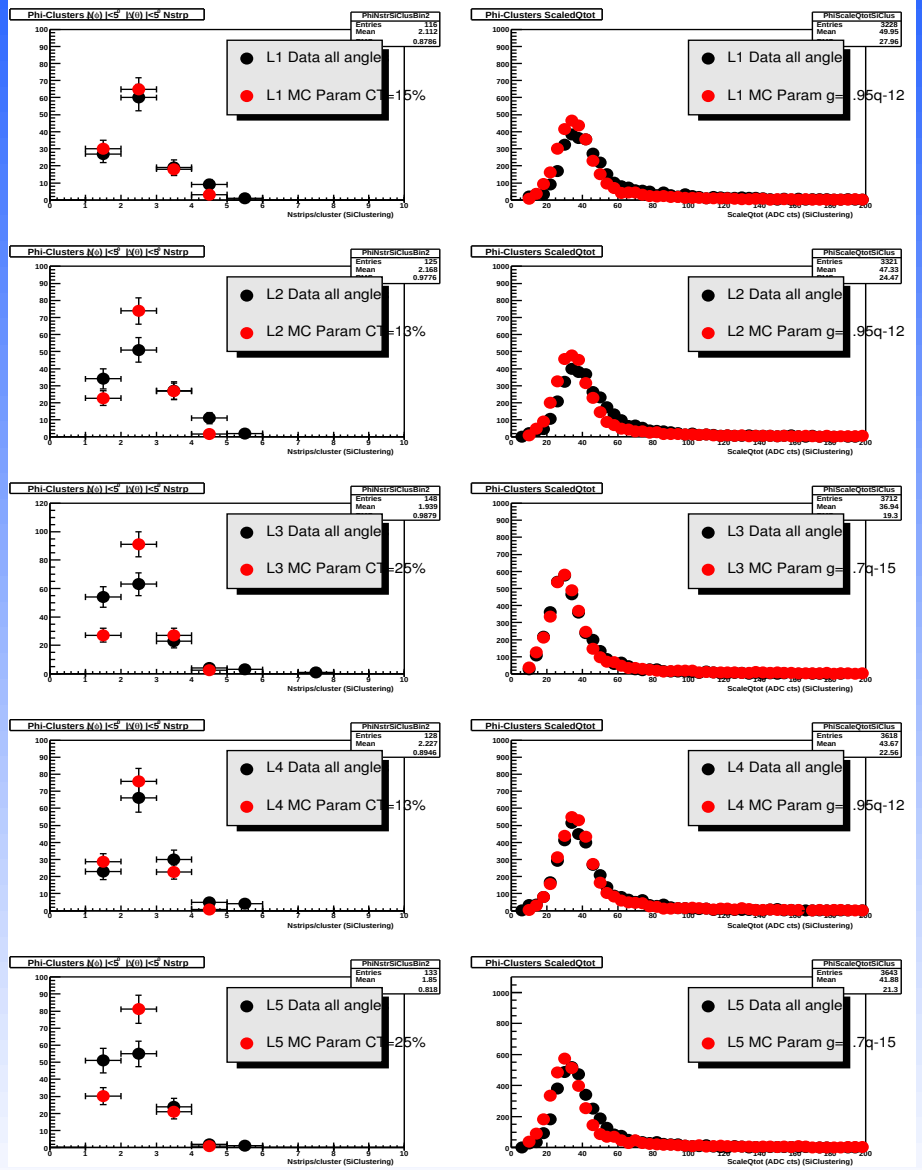
Status Update of the Parametric Model for the Silicon Charge Deposition

Sebastian Carron
M. Kruse, M. Gold

L1,L2,L3,L4,L5 Phi-Parametric Model-Latest Tuning



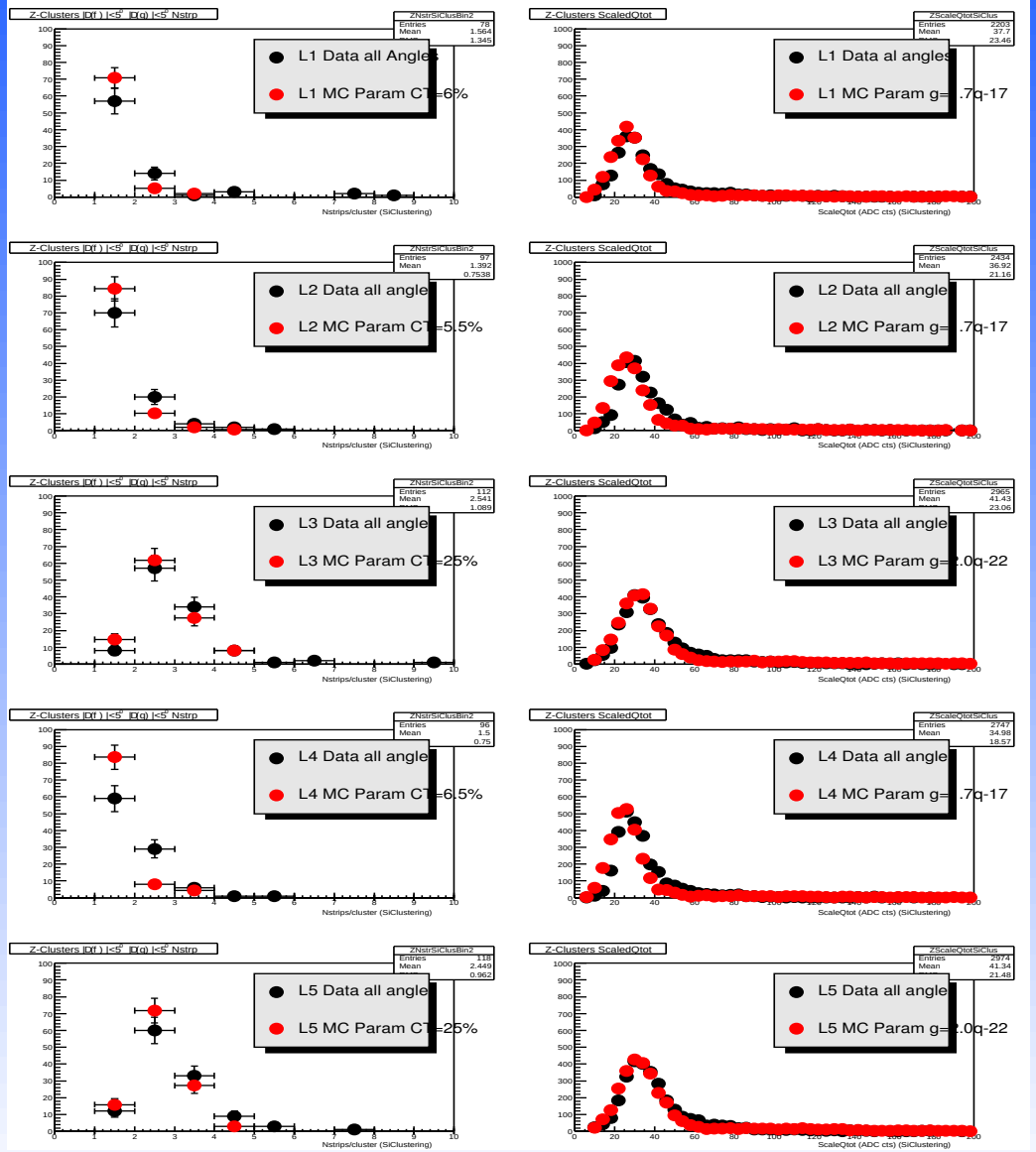
-The SVX part of the model has been ready for quite some time

-Tunning was performed using cross-talk, gain offset and slope, and added realistic noise

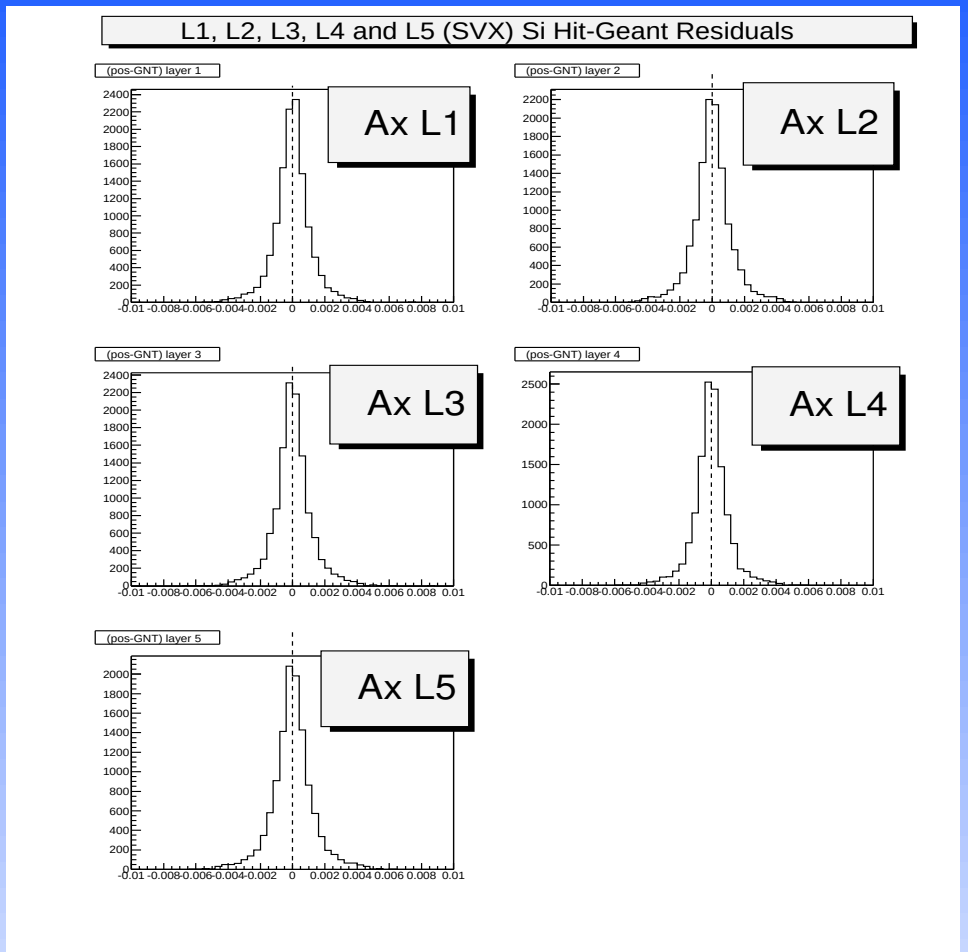
-Problems existed mainly with ISL geometry in the model.

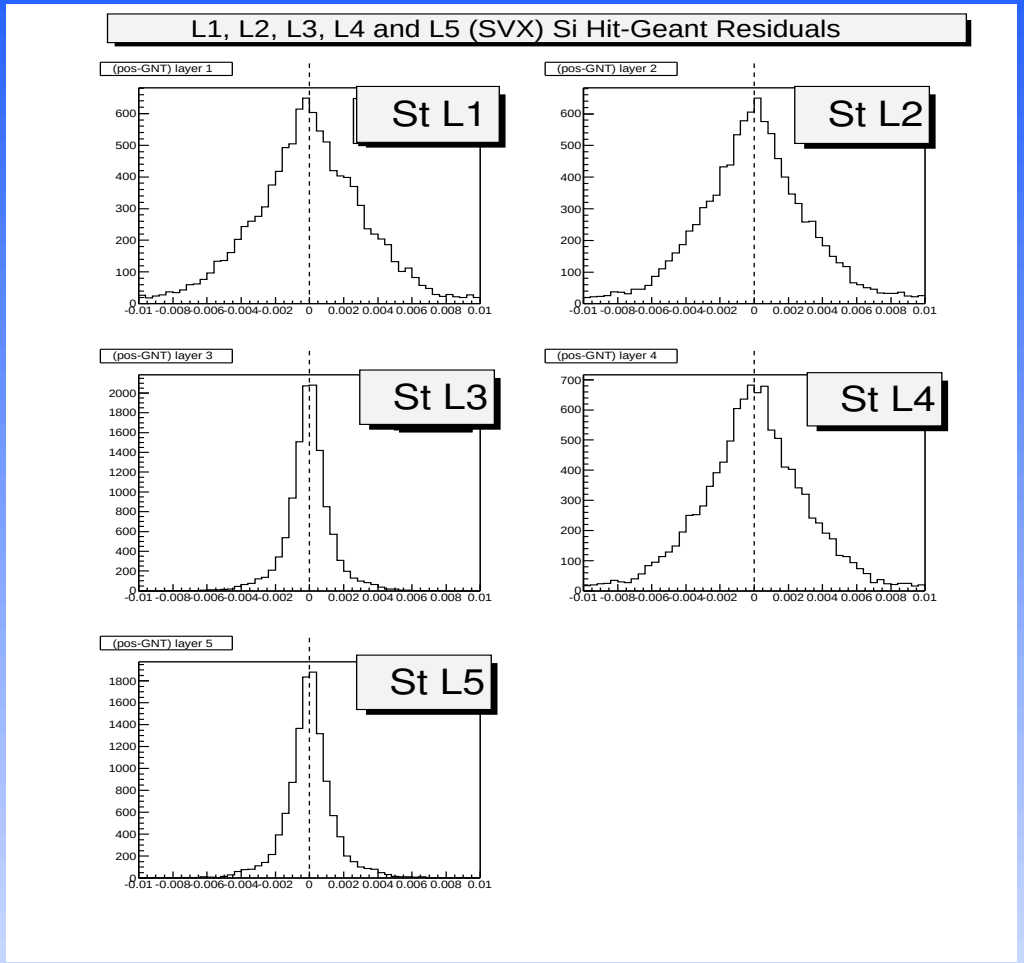
<-----SVX Axial side

L1,L2,L3,L4,L5 Z-Tuning-Parametric Model-Last Iteration



<----SVX Stereo Side





For the SVX, we calculated the centroid corrections and applied the Magnetic field, The Geant – Hit Position Residuals look good.

-As Mentioned in the last meeting we solved many problems with the ISL, mostly dealing with the Geometry and direction of the Magnetic Field effect.

-After Geometry correction, we found the Centroid Correction. At this point we found a Problem; The same centroid corrections applied for ISL and SVX, in strip units, in spite of the fact that both had different strip pitches.

------> We found that the model was not considering the correct ISL pitches, so we introduced new Charge Profile Parametrizations for L6 and L7.

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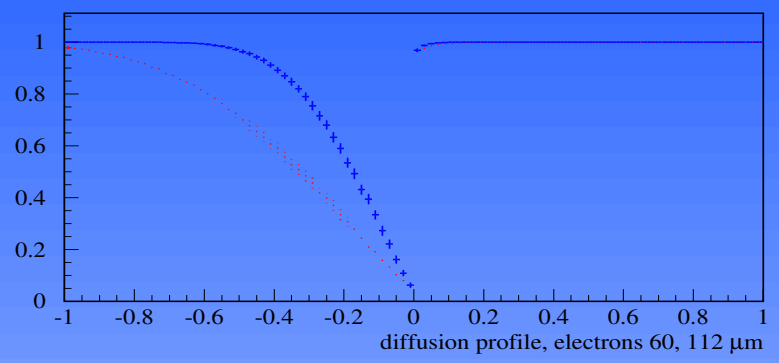
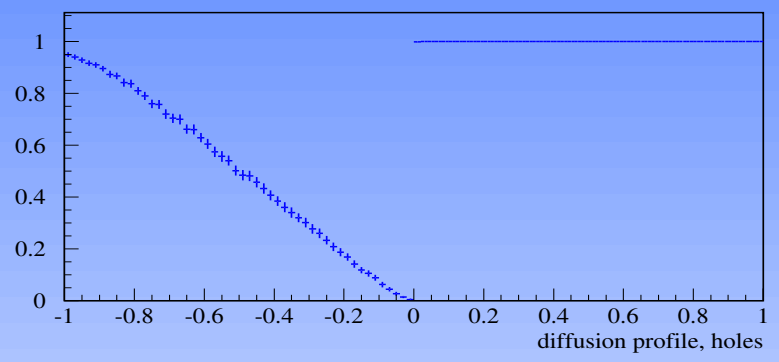
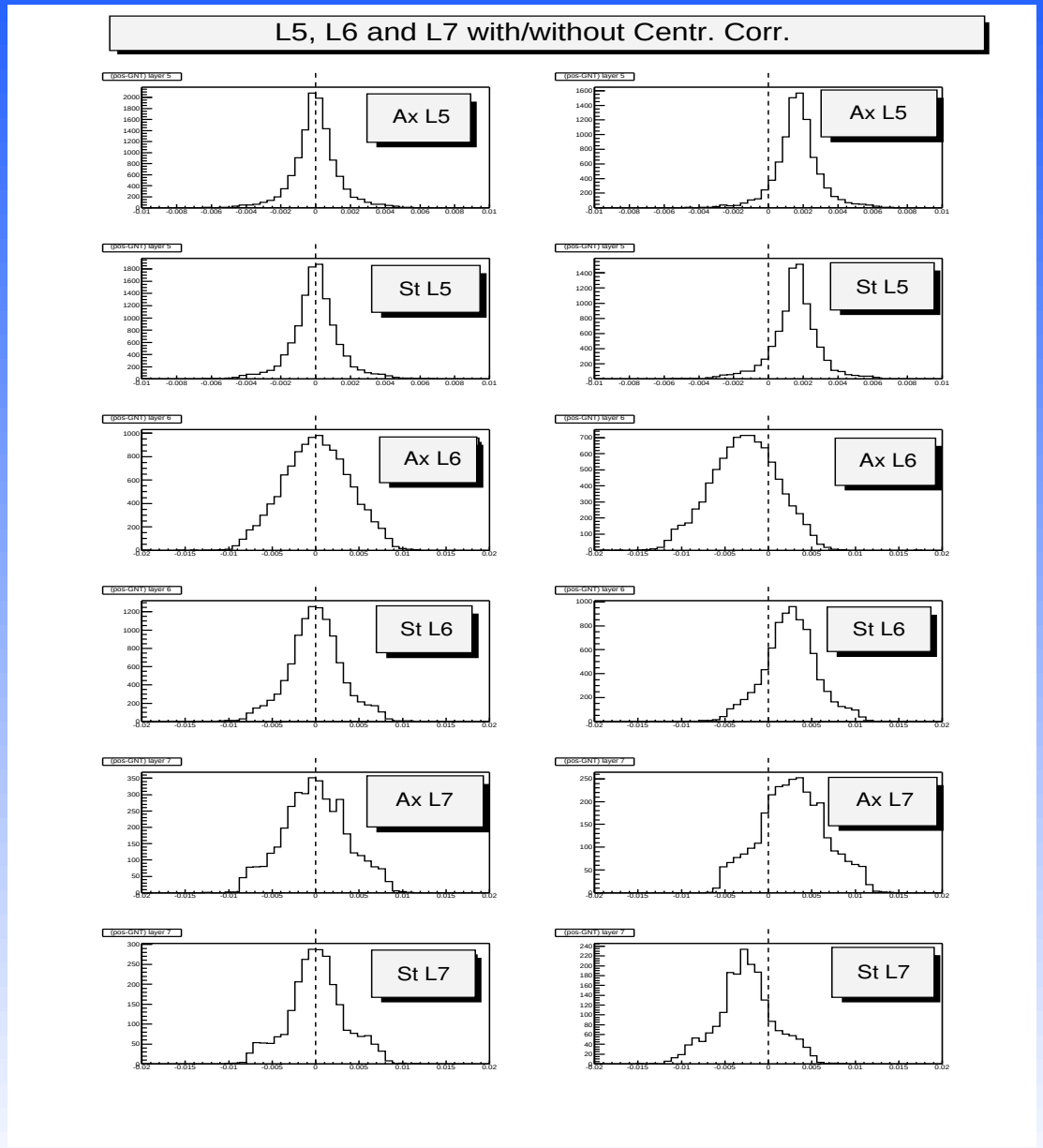




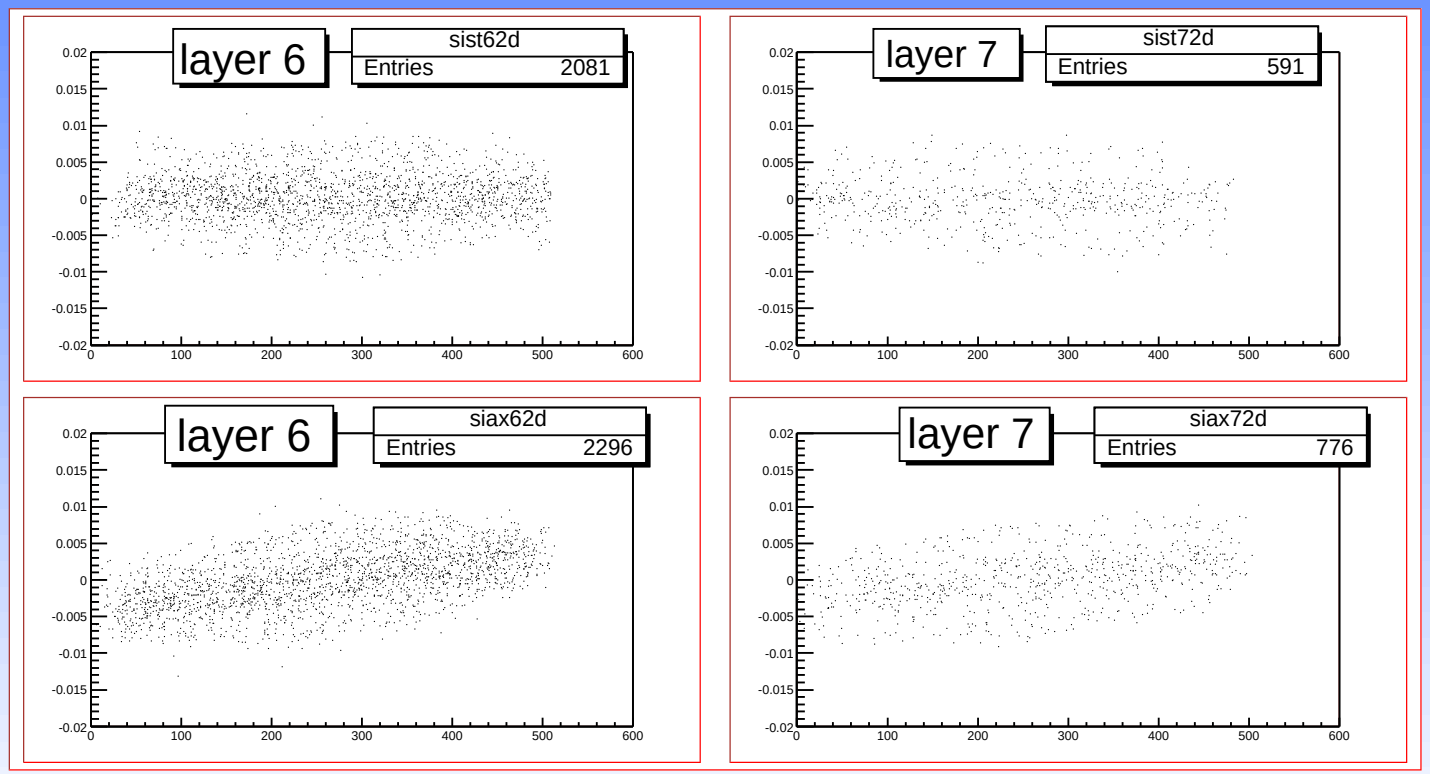
-Note that for holes at 60 microns it is similar to electrons at 112 (for L6 the centroid correction should close to the SVX case)

Here we have the SIHIT -GEANT Residuals for the ISL for various cases-->



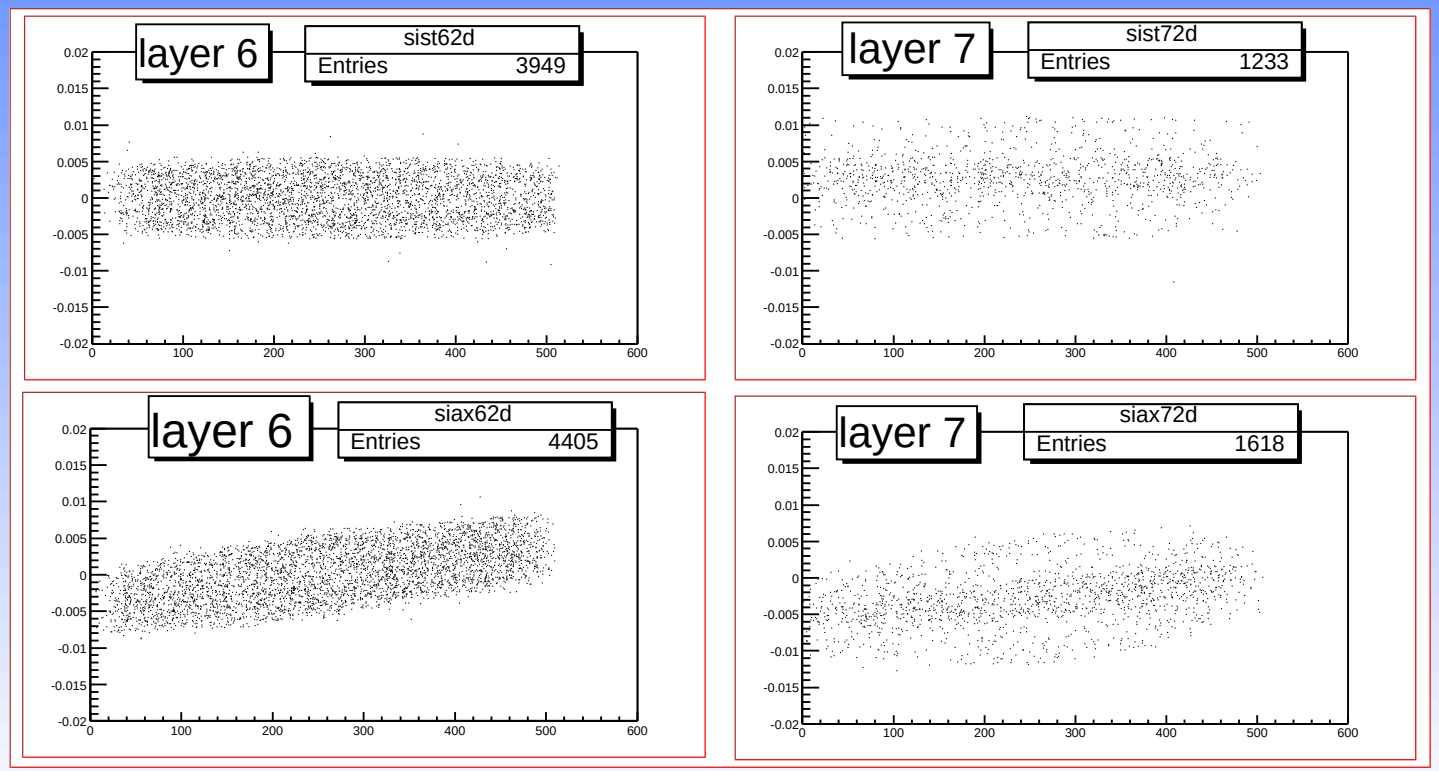
-This is were I stopped before my trip to Paraguay (Submitted L6 new Profile but kept old L& profile for the problems that can be seen in the previous and in the next plots)

Below are the Scatter Plots, they elucidate the Old Problem,



-So there is a slope in the scatter plot for L6 and L7 on the axial side, and a strange tail for l7 (all with new parametrizations)

-To understand if this is related to the Profiles below is a profile with no diffusion whatsoever, no noise, no charge sharing, no magnetic field. We can still see the two problems

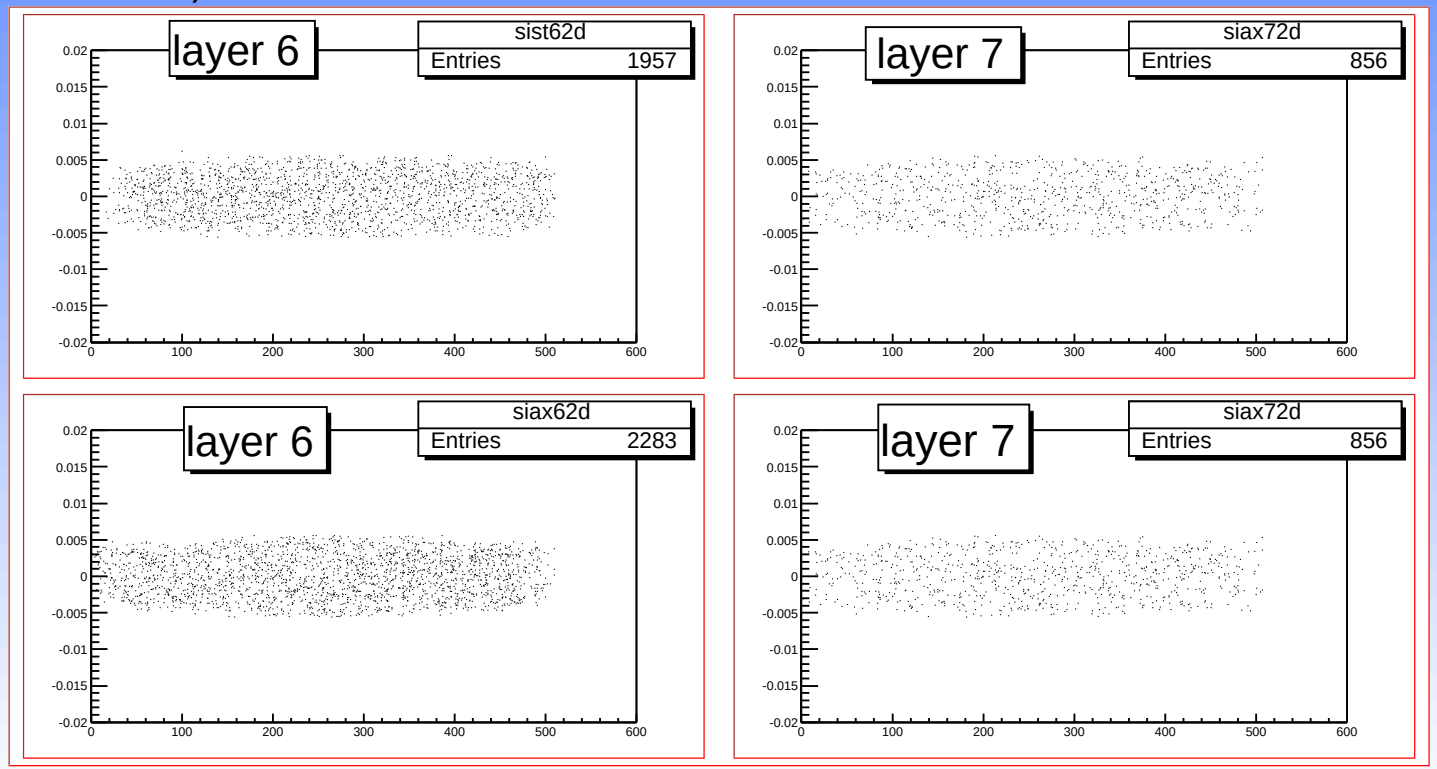


-We found the solution to the Problem:

-The L7 tail was an array that folded after a centain range

-The slope problem was a BUG in the Parametric Model where the ISL hit information was being stored in fHitIn and fHitOut by the use of stepinfo.steps.front() and back()

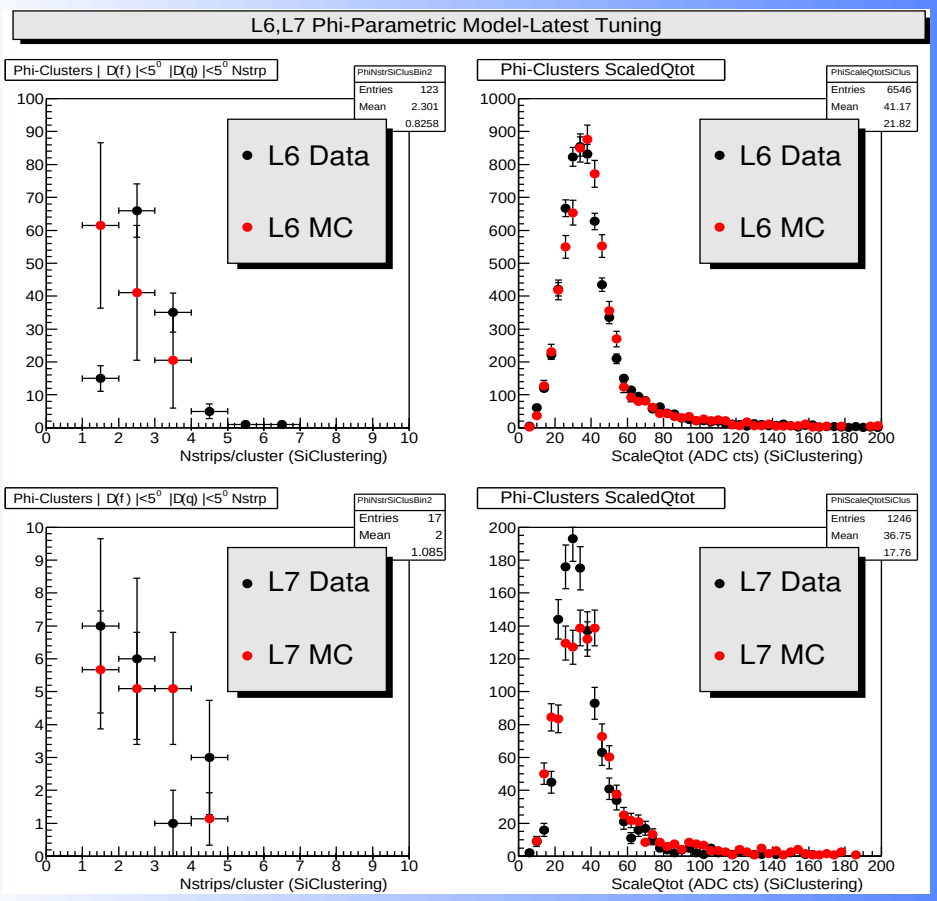
-Finally with this solved we can see the new ISL Residuals Scatter Plots (No Cross Talk)

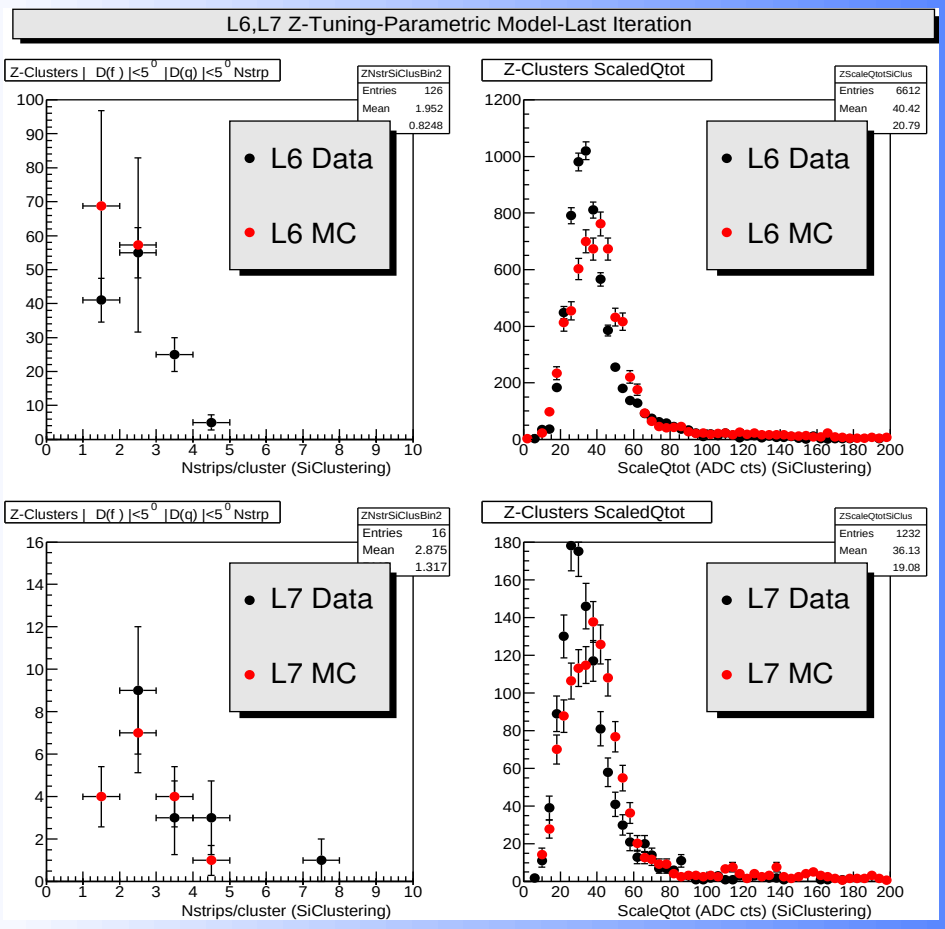


-I am resubmiting the code to CVS and finishing an ISL fine tuning.

-Also, we have new centroid correction values for the ISL

-Below is the Old tuning, I am finishing the new tuning these days.





Conclusions:

-The SVX simulation has been working well and has been tuned for some time already. However L00 is not considered in the model.

-For the ISL there were a number of problems. All known bugs have been fixed now.

-Now finishing the ISL fine-tuning.

- The new code will be available in the next version of the CDF software. Will let Manfred know of the tcl settings.

-Need someone other than myself to test the code, for validation

-In what regards L00, for now we will not consider incorporating it to the model, in the future we will begin by copying the geometric model L00 code into the Parametric model, and then improving upon it.