Prex Meeting

SAM Geometry Optimization

Cameron Clarke

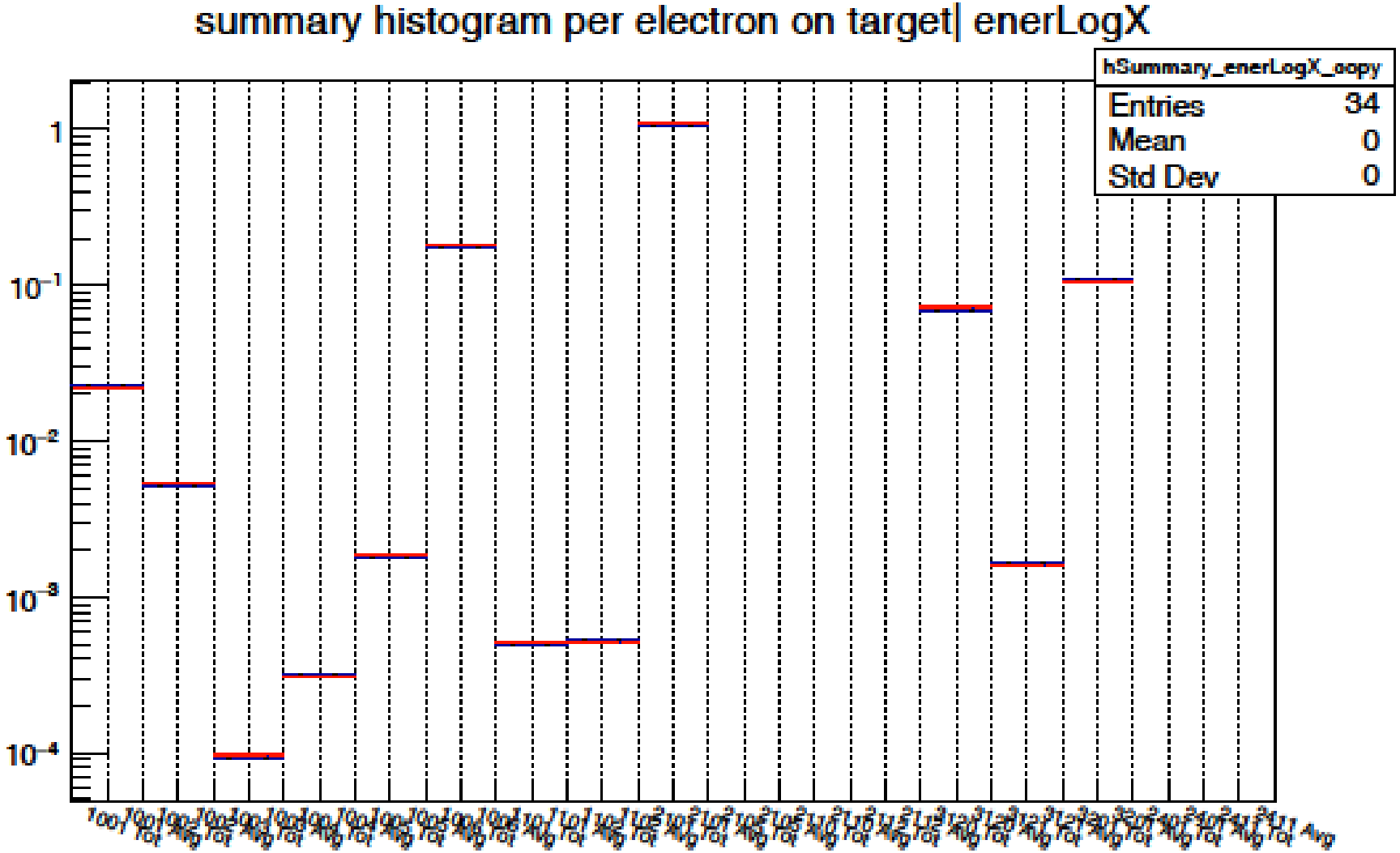
5-30-2018

Scattered flux at all detectors

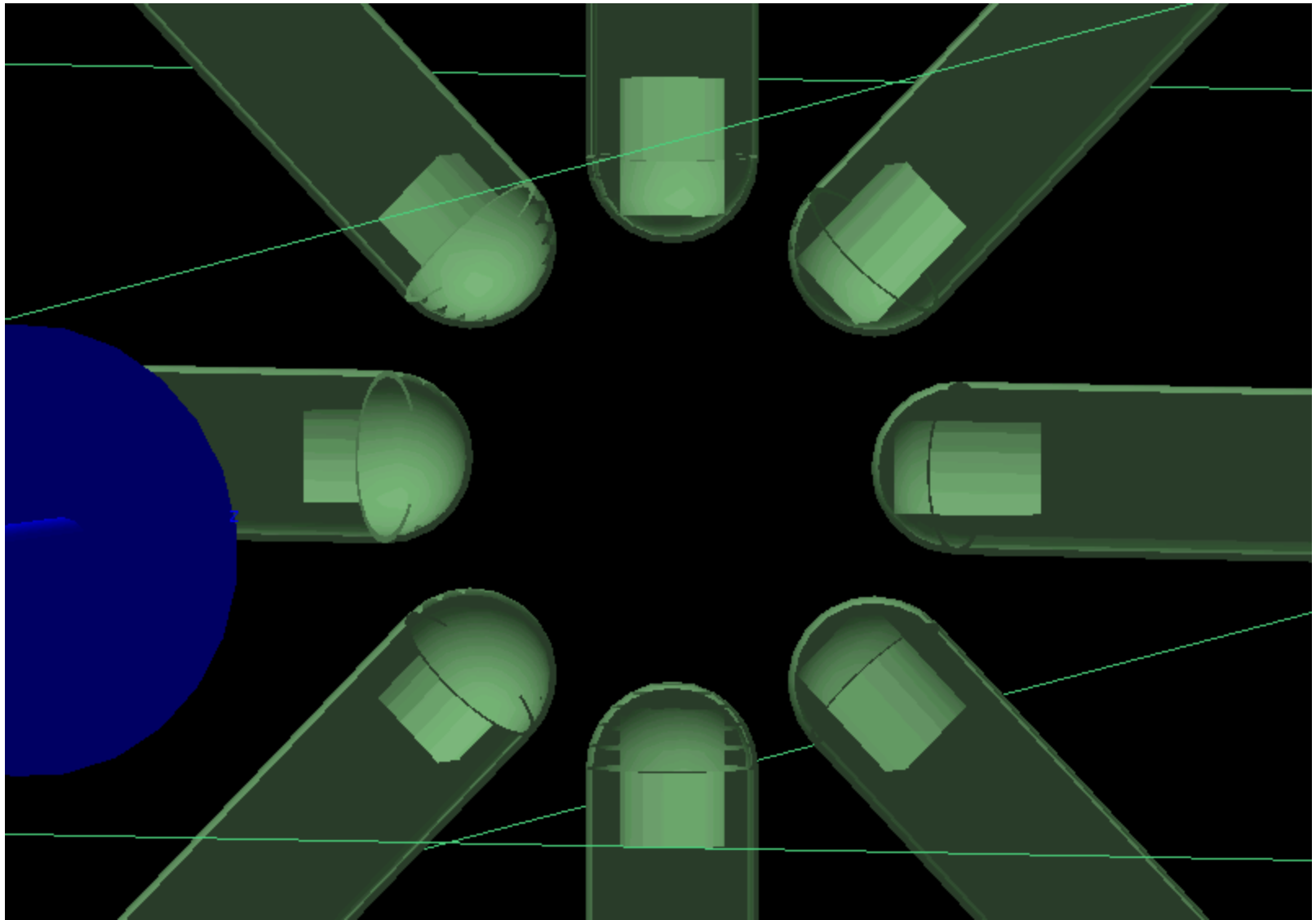
(6.3M events or so)

My results (generator 7, full prex geometry)

Ciprian's results

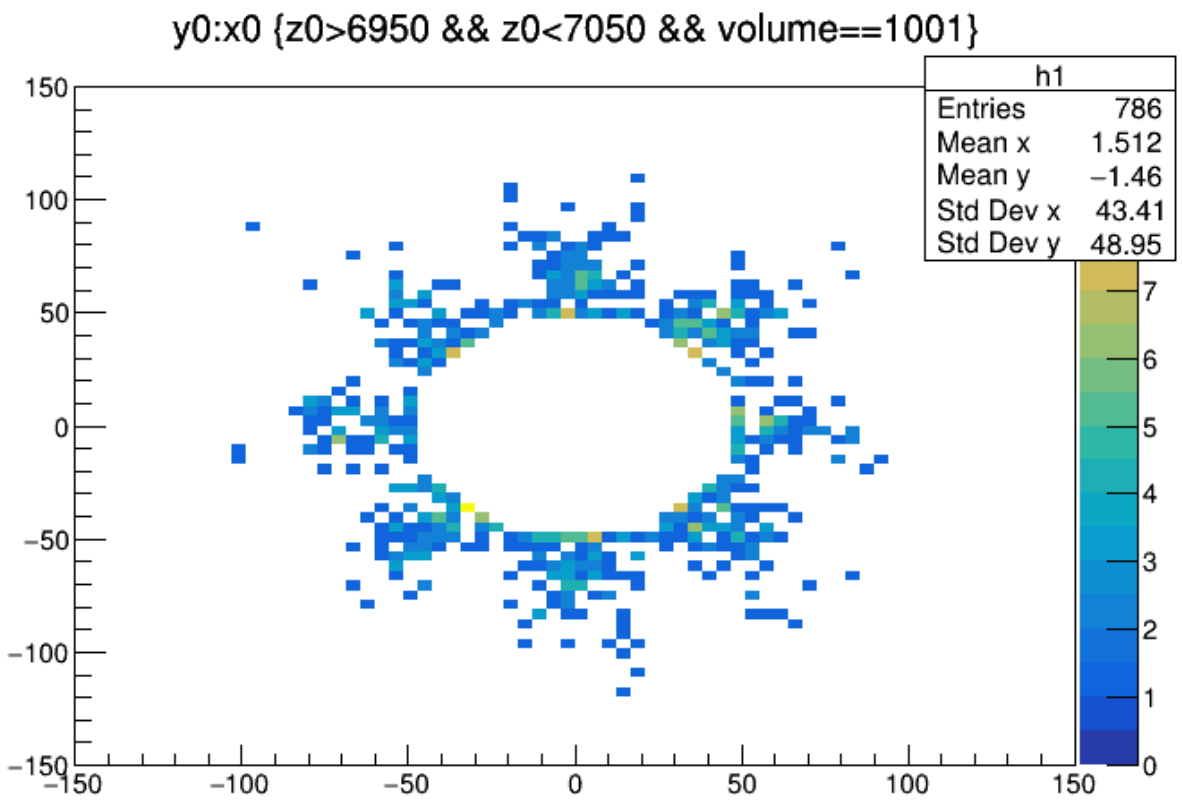


Spherical end cap

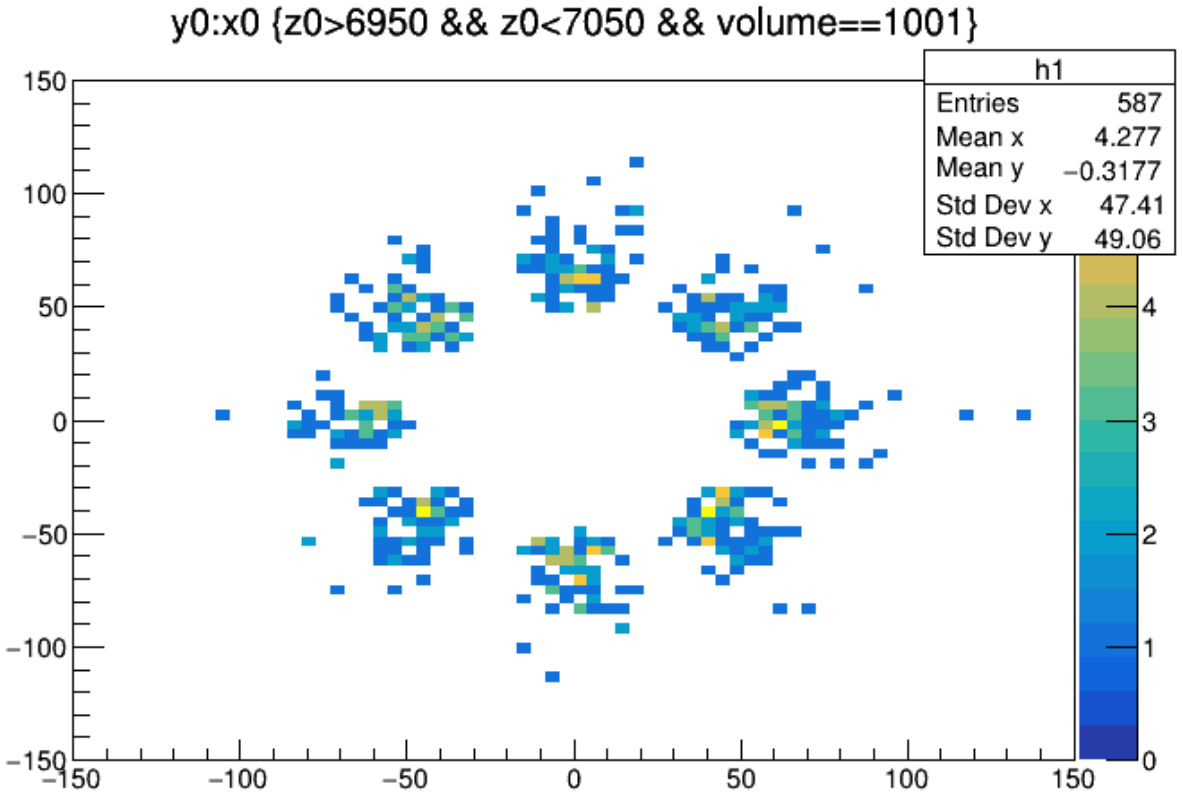


Vertices from SAMs hitting HRS

Cylindrical Endcap



Spherical Endcap

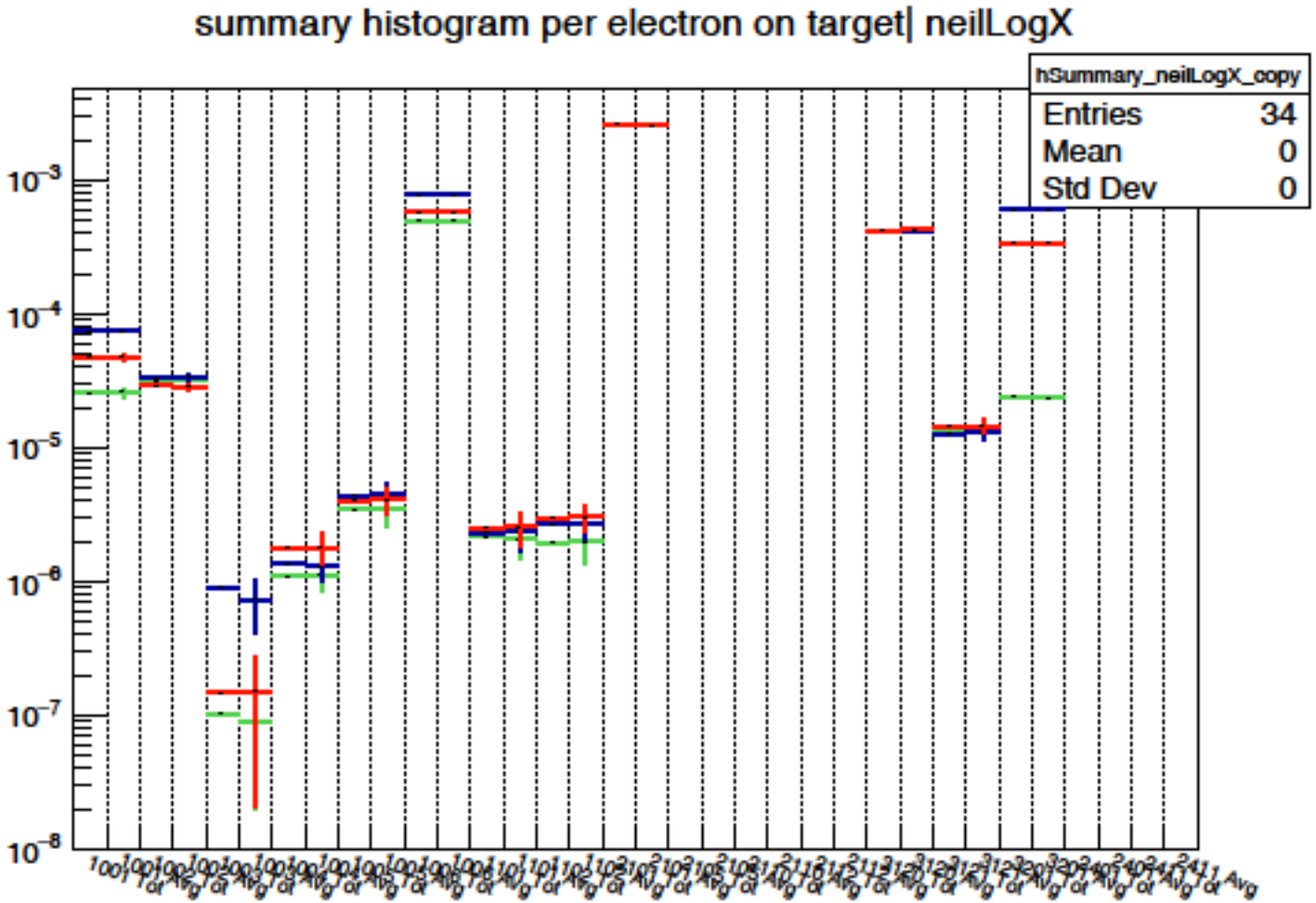


Note color scale is rescaled by factor of 2 from left to right

Comparing the radiation all over the hall

Blue = baseline, green = mostly removed, 90mm pulled out of the beamline, red = realistic scenario, 20 mm pulled out

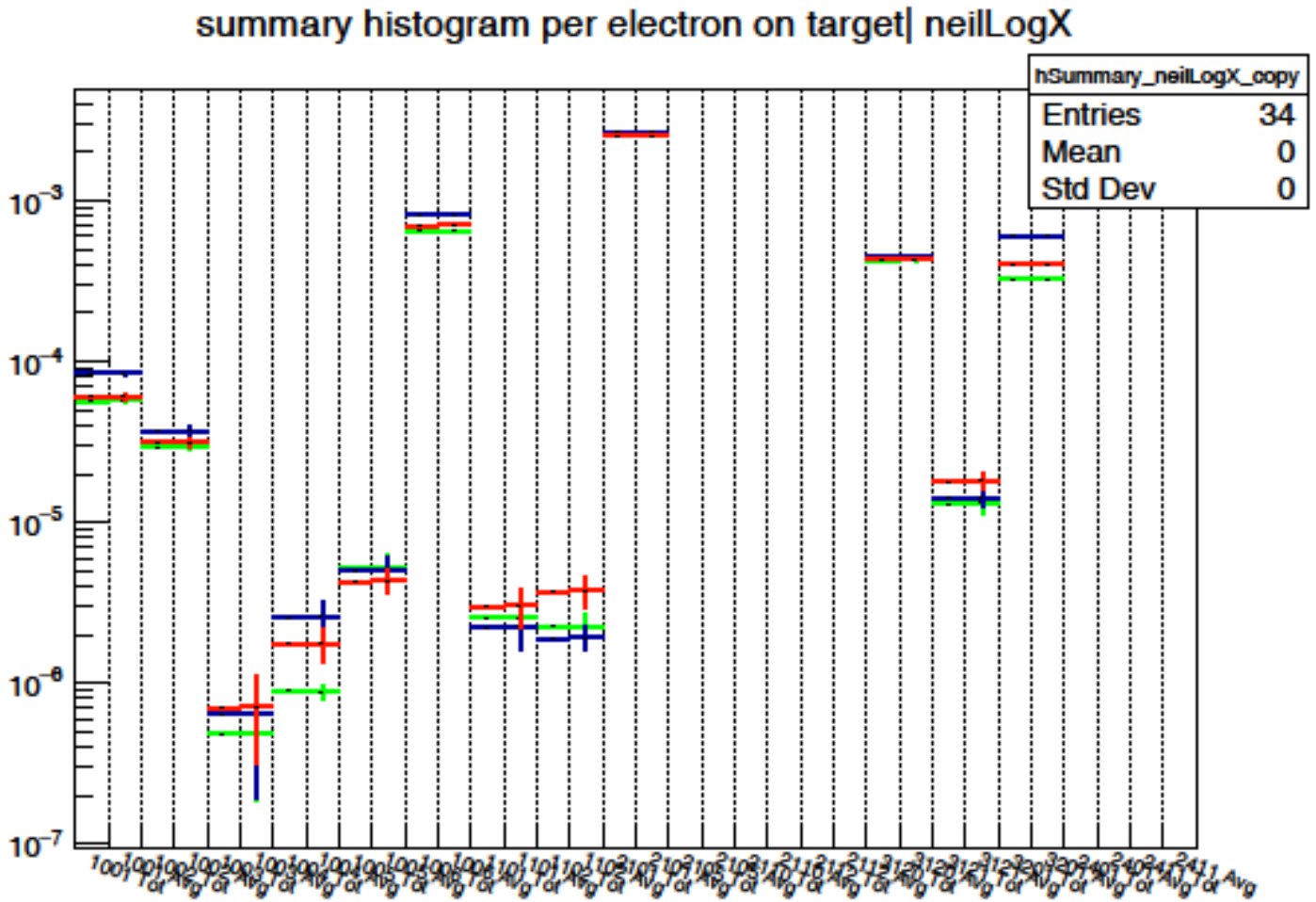
Pulling the SAMs out radially



Comparing the radiation all over the hall

Blue = baseline, 130mm thick, green = mostly removed, 0.1mm thick, red = realistic compromise scenario, 50 mm thick

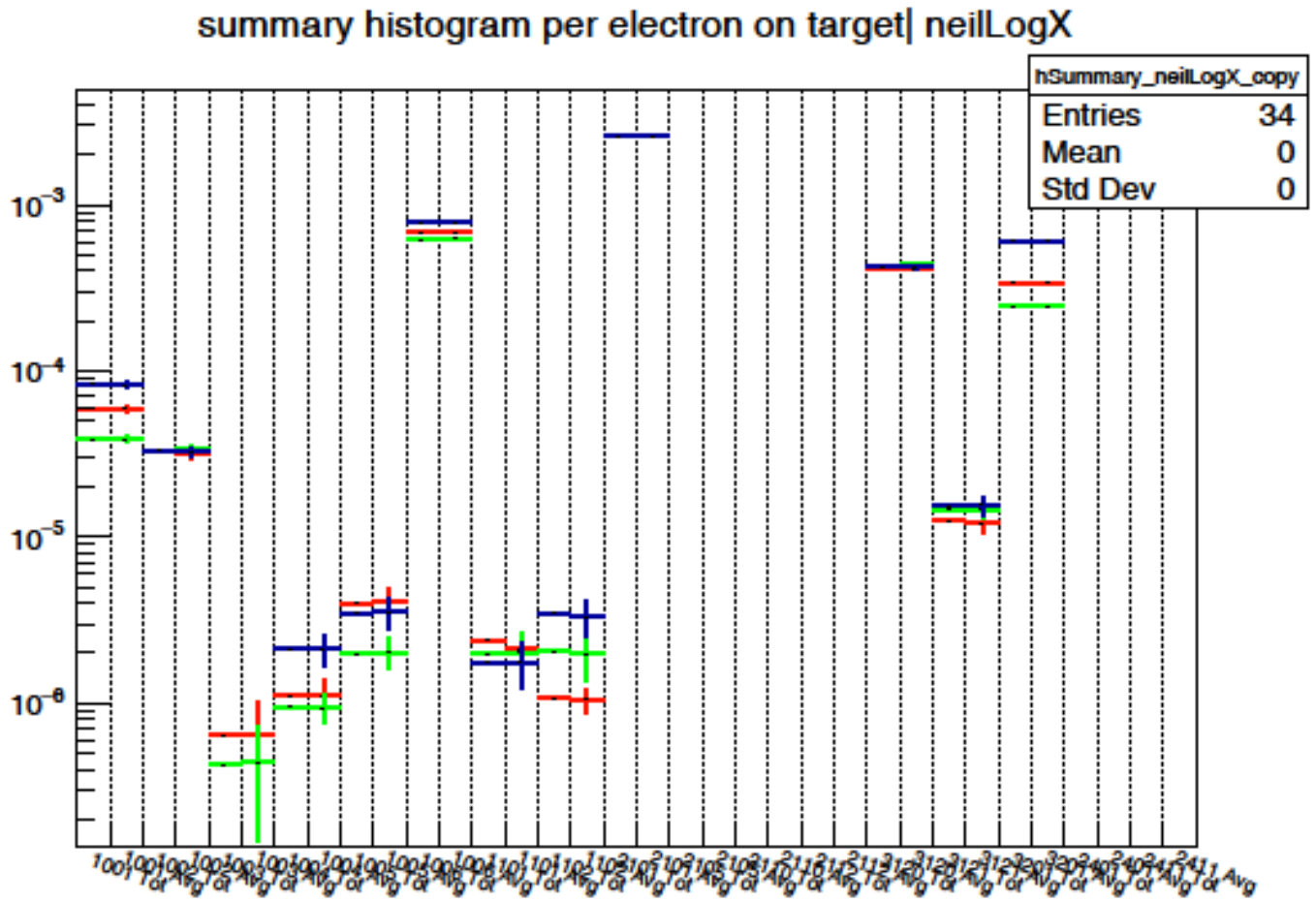
Changing the thickness of the quartz



Comparing the radiation all over the hall

Blue = baseline, 1500μm thick (should be 1651), green = mostly gone, 100μm thick, red = realistic compromise scenario, 500 μm thick

Changing the thickness of the aluminum can



All weighted NEIL hits on Roof, HRS from everywhere in the hall (4.5 Million Events)

cylindrical is the current physical geometry
modified radial offset, Q and Al thicknesses

baseline: Quartz Thickness=13mm, offset=0mm, Aluminum Can Thickness=1500um=1.5mm							
Detector:	Config:	Qthick=5mm	Qthick=0mm	Offset=90mm	Offset=20mm	Canthick=500um	Canthick=100um
det-1001-hrs	8.45E-05	0.72	0.66	0.3	0.56	0.69	0.46
det-1006-roof	6.55E-07	1.08	0.75	0.14	0.23	0.99	0.67
There is a ~10% uncertainty on these baseline numbers, and on each configuration, so this is only a rough estimate							

This is just a summary of the data I have produced in quick simulation runs.

It looks like putting a radial offset helps a lot, and I can work from here and make better analyses to keep track of what all can be done to optimize