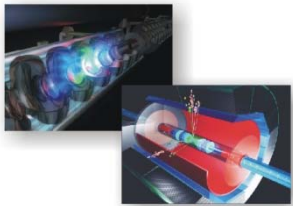




Plans to study the Readout design in the forward region

- ❑ Currently: one big sensitive silicon disks: we record the Geant 4 SimTrackerHit, no readout segmentation, one simulated charged track can leave more than one hit in each layer.
- ❑ Need to come up with optimum/affordable tiling/pixeling solutions for the forward tracking region.
- ❑ Need to study basic quantities: Occupancy, acceptance etc.
- ❑ Need realistic input for tracking/pattern recognition studies (Clusters, Digis)
- ❑ once that's in place we can do tracking and pattern recognition studies: confusion ghosting....)





Want to get feed back from the hardware experts.

- What kind of readout layout do you have in mind and want us to study?
- What studies?
 - Occupancy, radial dependencies etc. etc.
 - acceptance
 - What are relevant parameters we need to vary?
- Please let us know!

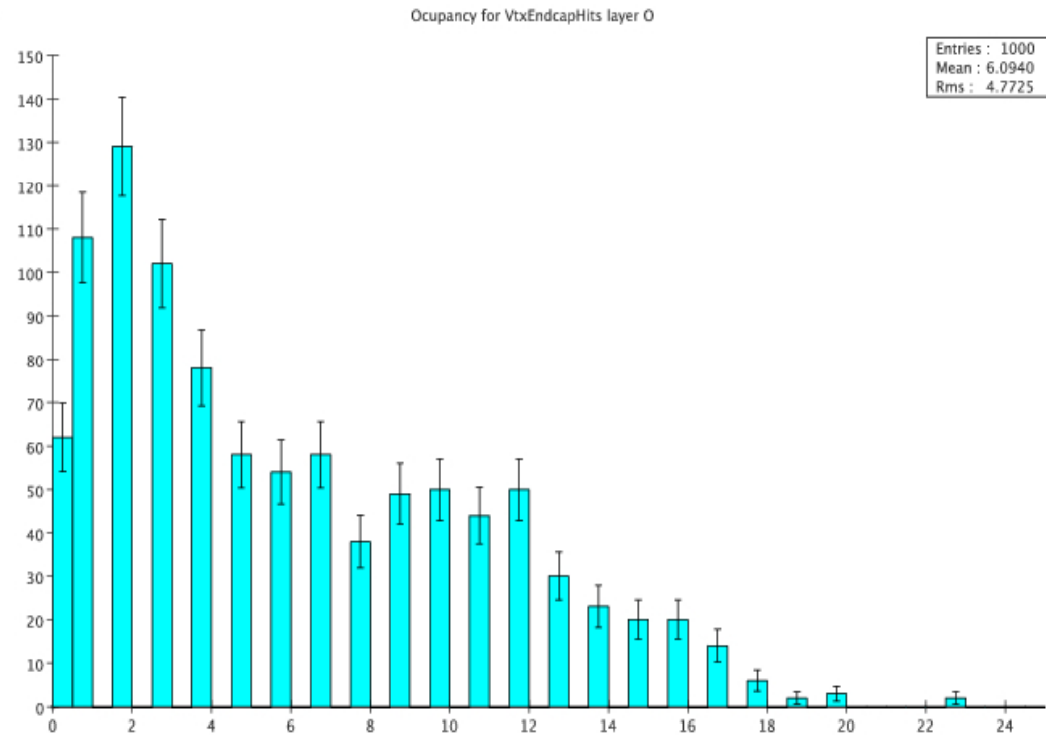
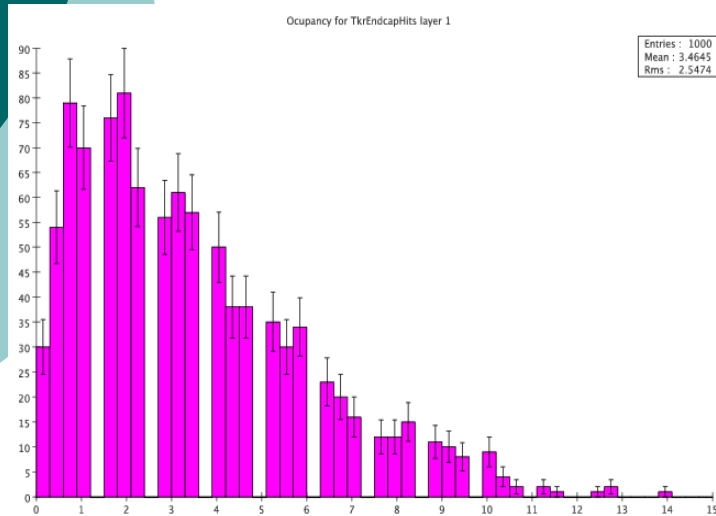
The logo features the letters 'ilc' in a stylized, blue, lowercase font. To the right of 'ilc', the word 'Summerstudent' is written in a teal, sans-serif font. A horizontal dotted line in yellow and green passes behind the letters. On the left side, there are decorative elements: a small teal triangle at the top left, a vertical teal bar, and a large teal shape that is a quarter-circle with a curved edge on the right, partially overlapping the text.

ilc Summerstudent

- Francisco Javier Carrion Ruiz will be working with us for the next 2 months, he is setup with netbeans, java, jas3 etc.. But he is new to JAVA (So am I)
- First project was:
 - access the SimTrackerHits in the Forward disks. Assume readout with radial strips, in one or several belts. Occupancy is defined by the percentage of strips fired in each events.
 - Compare occupancy distributions of physics events (done) with beam beam events (don't know how yet).



Occupancy in % for 1 mm at inner radius. For Z to jj events. (Proof of concept)



Francisco Javier Carrion Ruiz



Summerstudent (cont.)

- We will look into:
 - Norman's wedge class (see next page).
 - Tony proposed to use wired to visualize. Could imagine a kind of Lego display (calorimeters).
 - Tim's raw tracker hit creation class for strips (is org.lcsim.contrib.SiStripSim the correct place to look?)
 - Nick's pixel classes for digitization.
 - Resurrect my old CDF stuff?

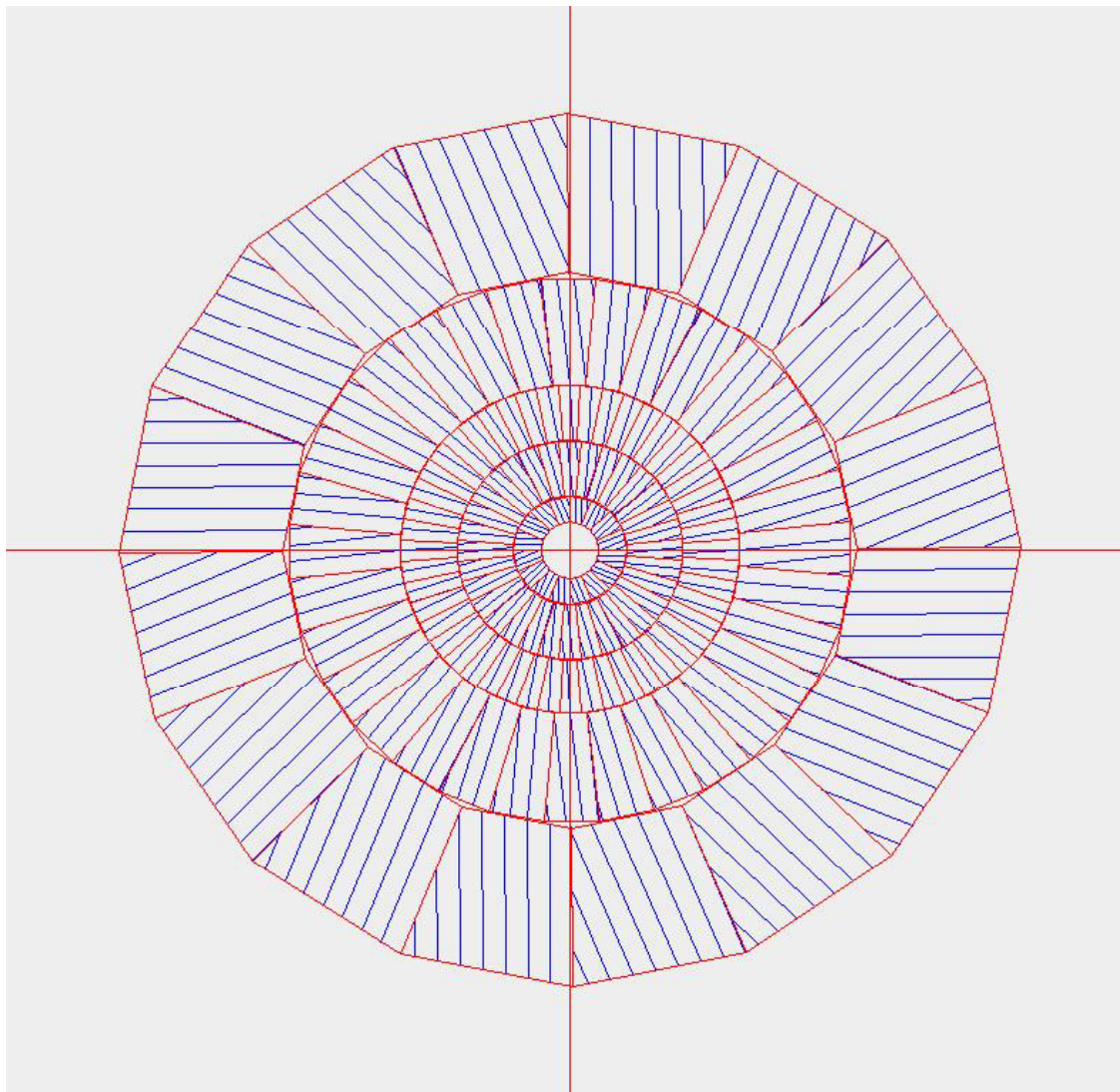


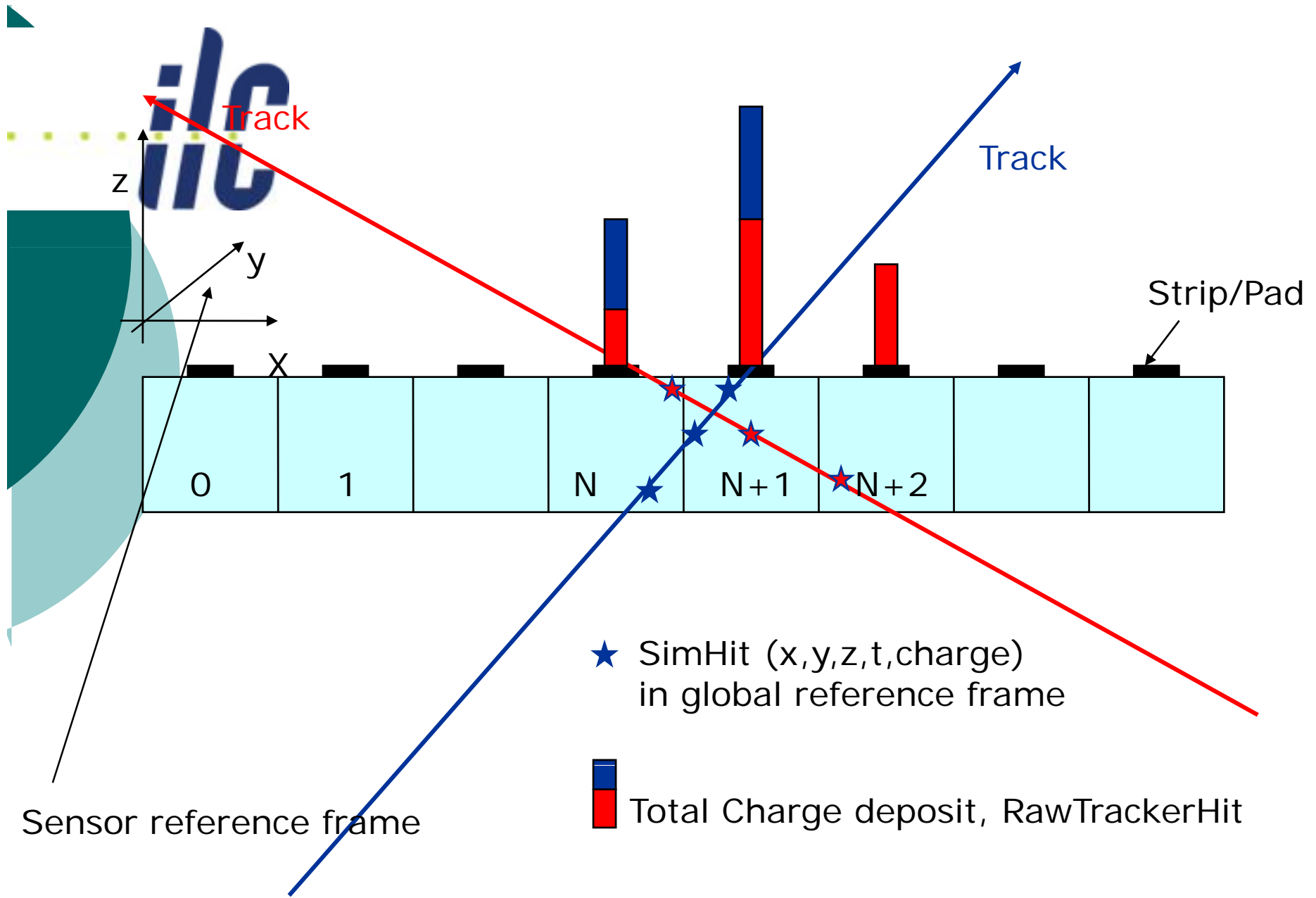
Summerstudent (cont.)

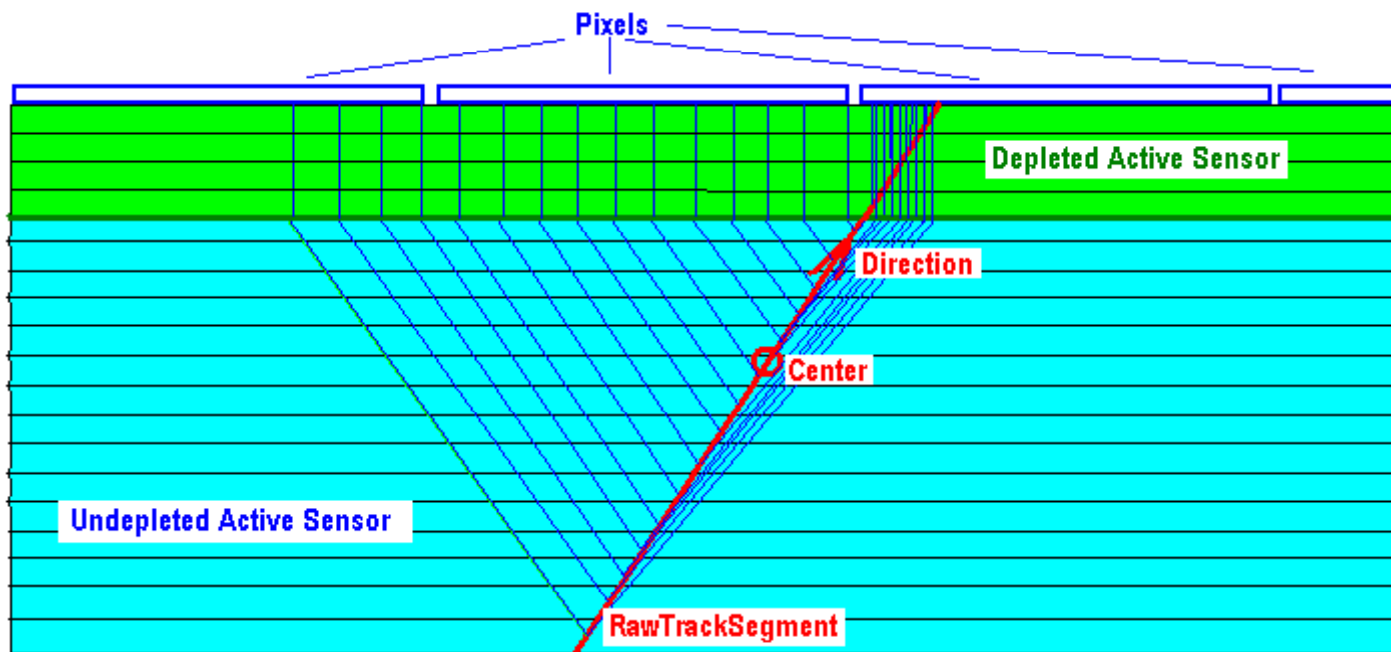
- When we break the disk up into trapezoids (or similar)
 - We will include a full range of aspect ratios, long in r , long in ϕ and approximately square. (strip lengths and orientations). Stereo.
 - Do the studies for signal and background events.
 - Add noise Hits.
 -



e.g. Norman's Tiling example

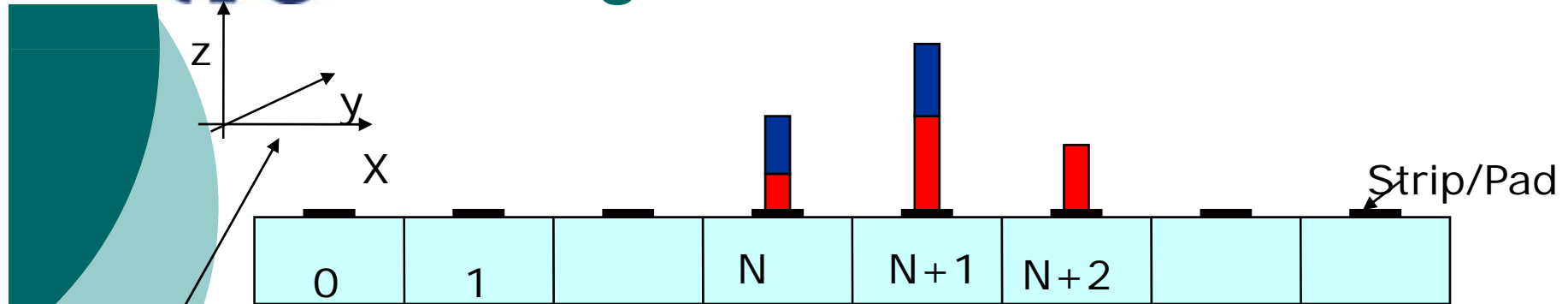








Clustering:



Sensor reference frame

Cluster: List of Strips/pads that make up the cluster

Center of gravity of Cluster: provides uncorrected position measurements in detector reference frame

Nr. of strips, pad/strip size etc. provide precision of local measurement. (covariance matrix)

Tracking is driven from clusters!!!



Infrastructure

- **Important:** While doing this studies make sure that the infrastructure gets build up and that the corresponding objects:
 - RawTrackerHit, Digis, Cluster are created and used in the following steps.
 - For now we don't worry if very simplified algorithms are used to create this objects. E.g. don't need sophisticated digitization at the moment
 - e.g. input to pattern recognition, tracking should be clusters converted into TrackerHits (only defined for the track they are used on)!



In Conclusion

Please give us your input
(email: wenzel@fnal.gov ,
Ext. 6034)

Thanks In advance!