SuperB:
DCH Update on FullSim Bkg Studies

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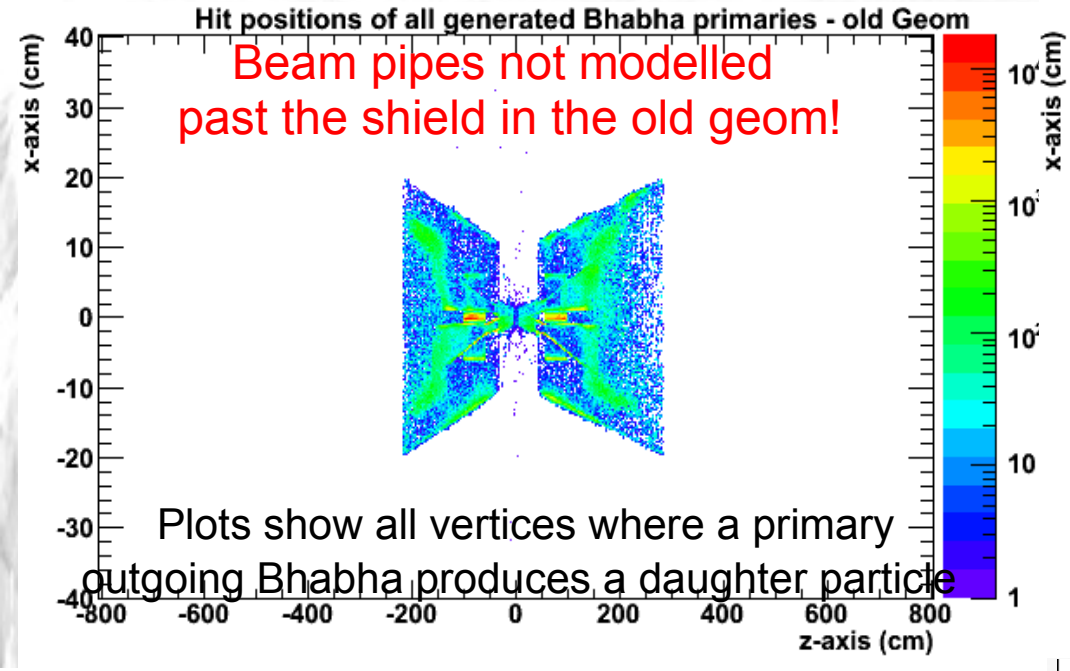
DCH Update
March 14, 2011

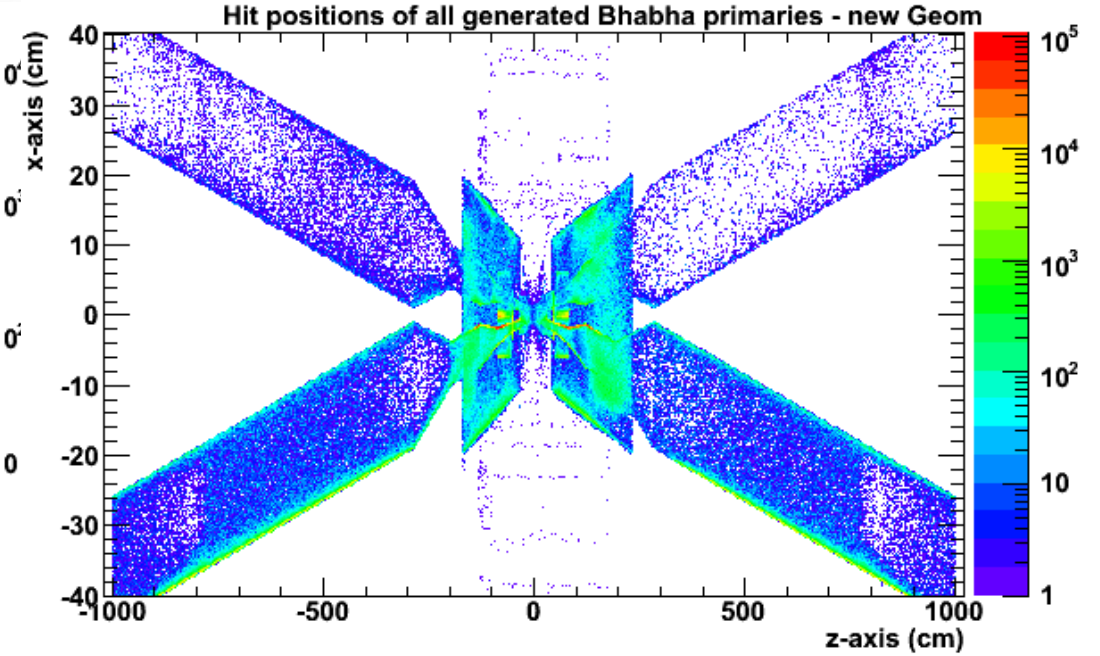
Overview

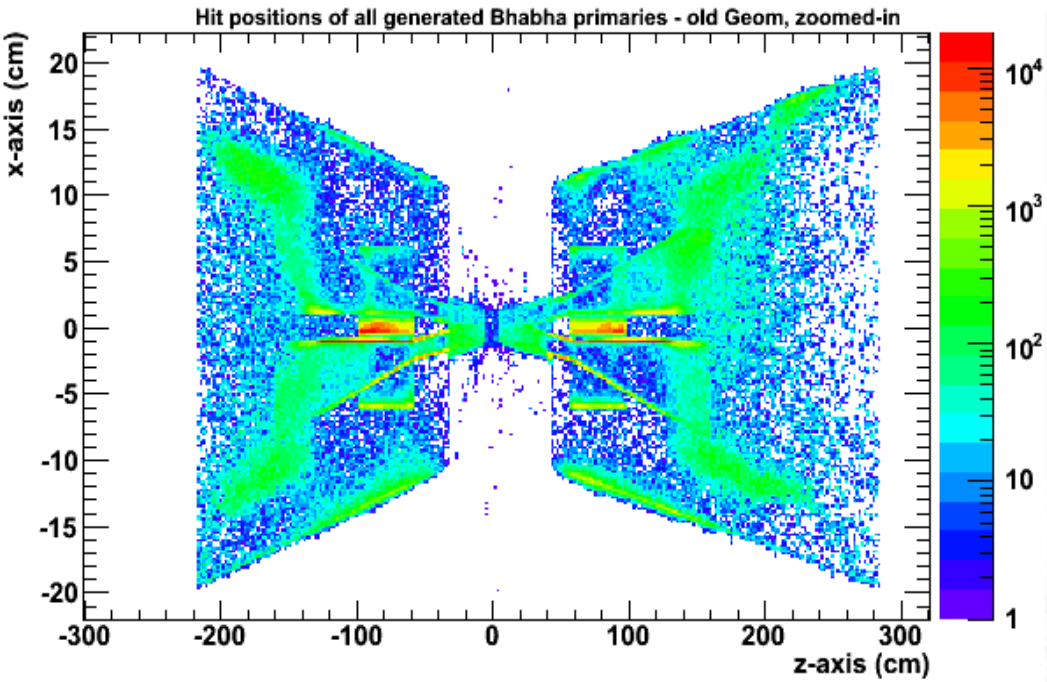
- New vs. old geometries:
  With the plug/ horseshoe shielding added

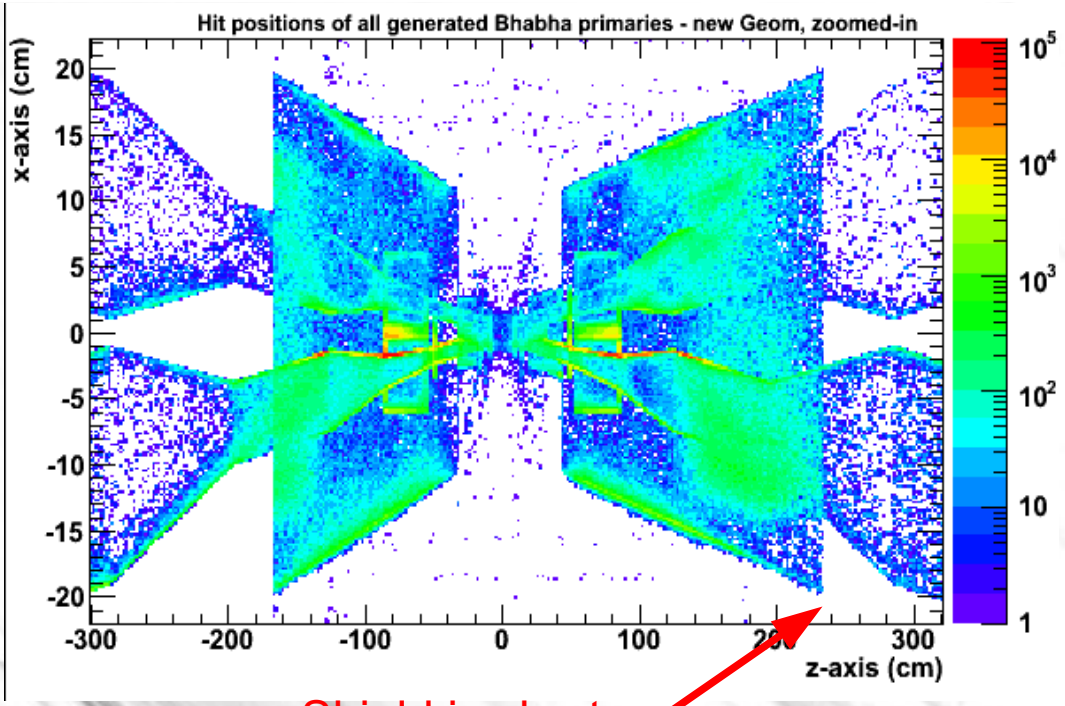
- Note: My occupancies are normalized to ~215 MHz, while Riccardo's is 266 MHz. I still need to check/fix this.

New Vs. Old Prod. Geometries

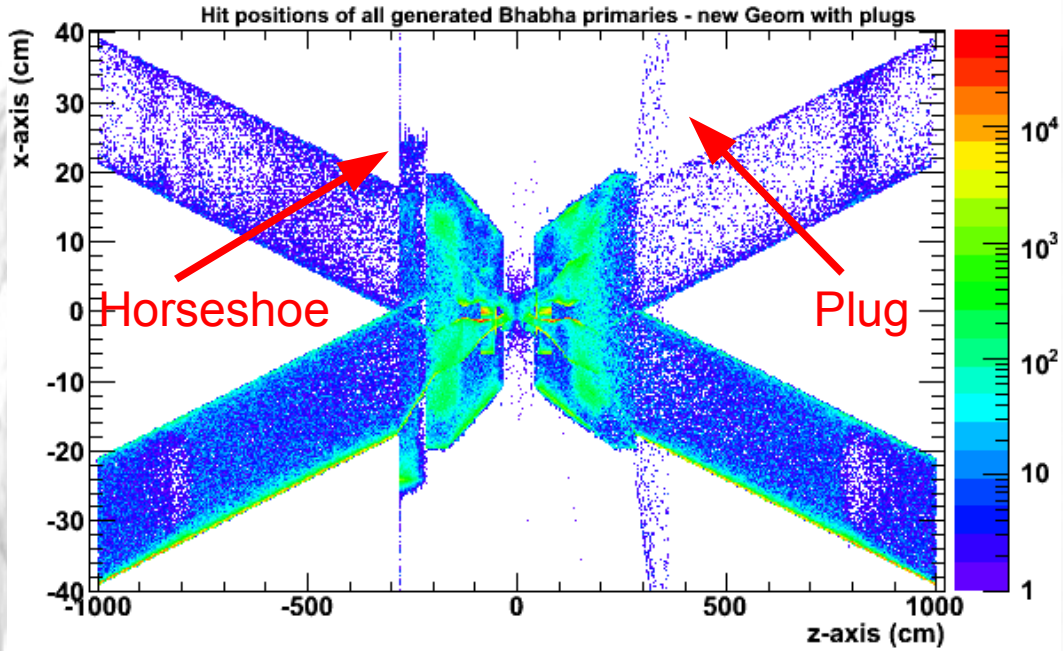




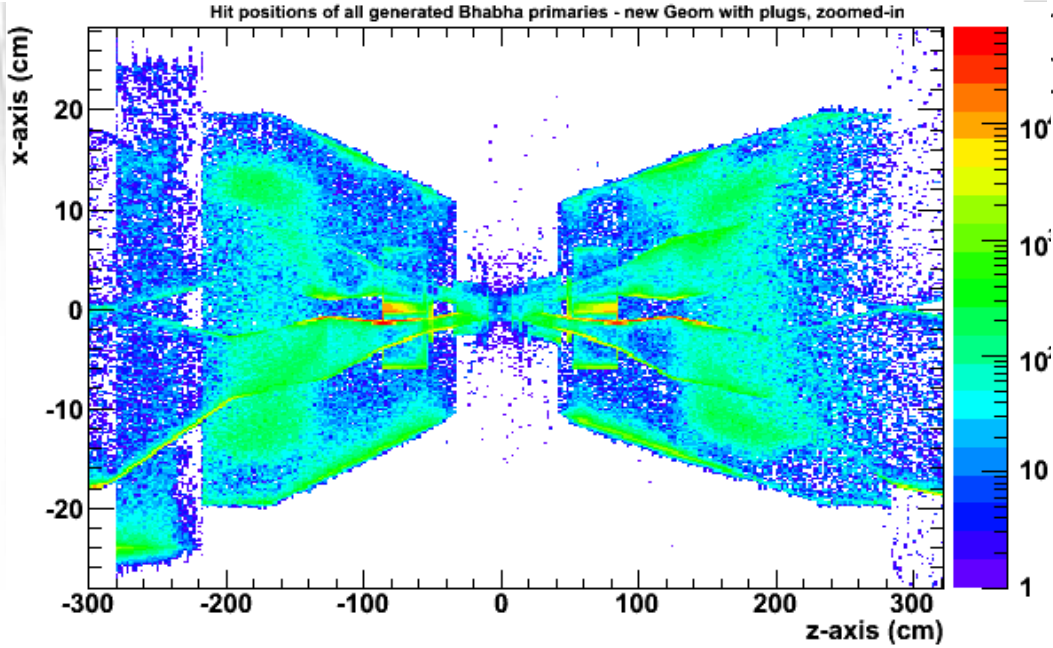


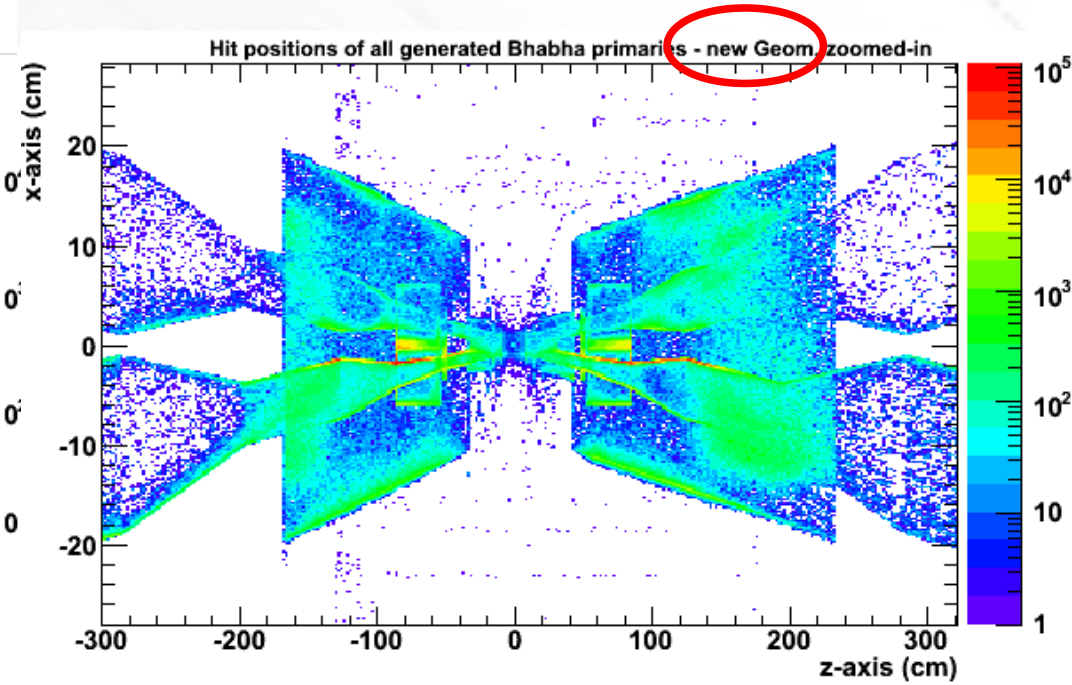


Newest Geom with Plugs

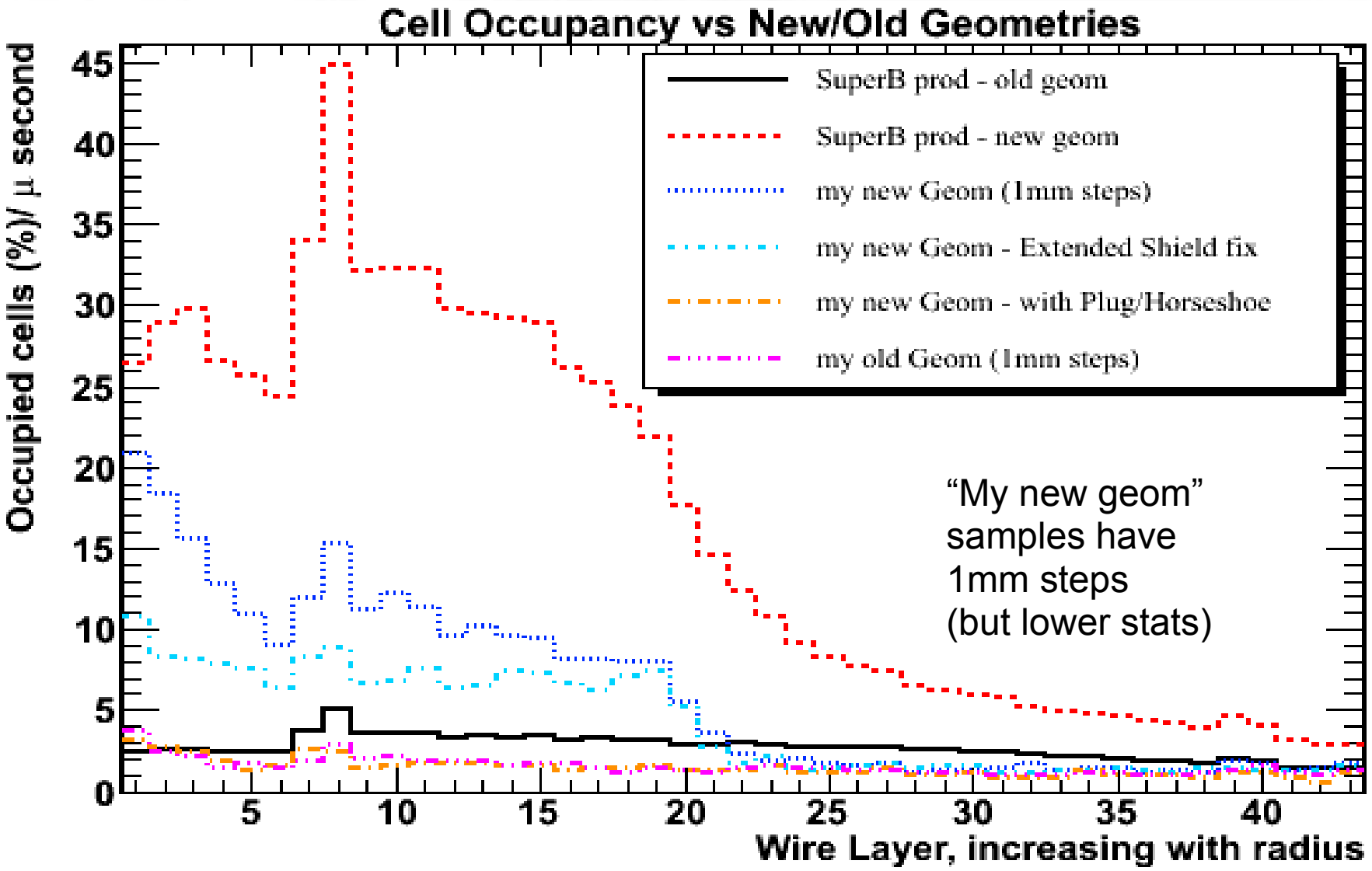


- Extended tungsten shield
- Fwd plug and Bwd Horseshoe
- New FTOF model
- Trimmed back DCH
  (5cm in forward region)

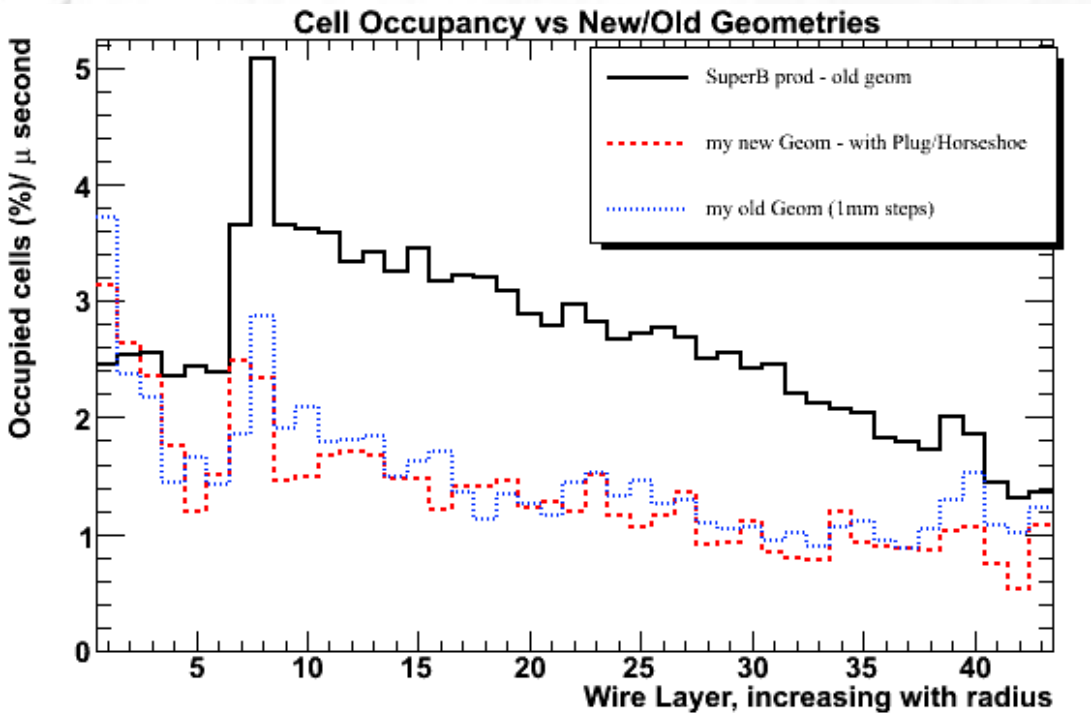




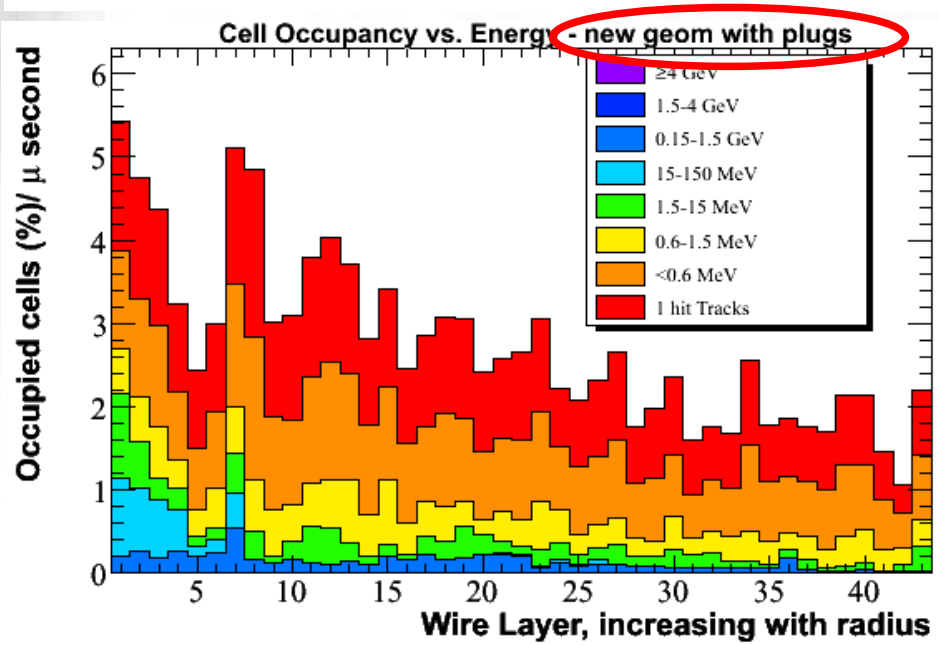
Comparison of Samples (Bruno only)

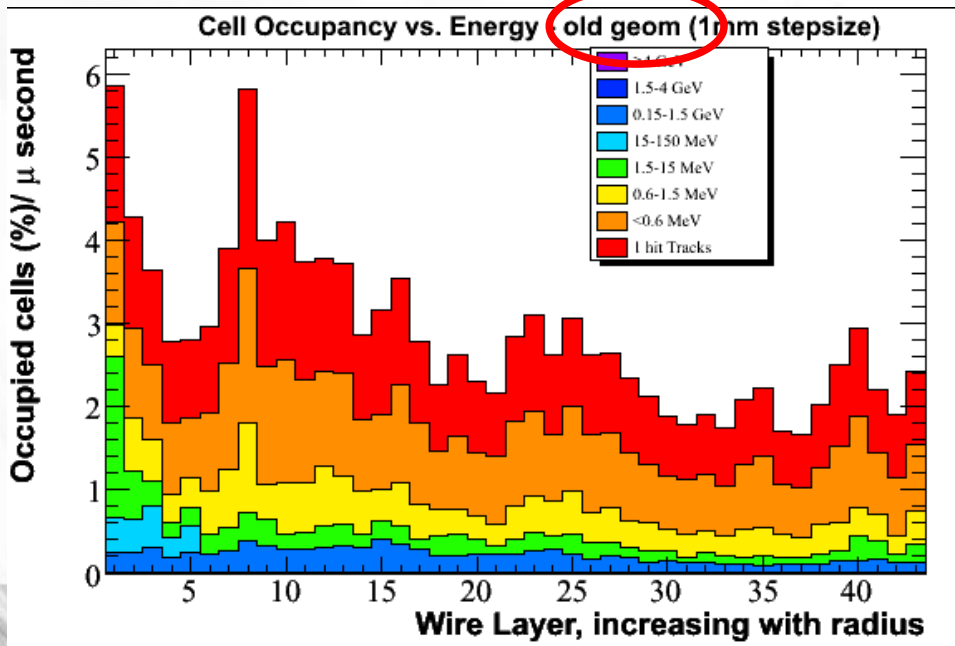


Geom vs. Energy

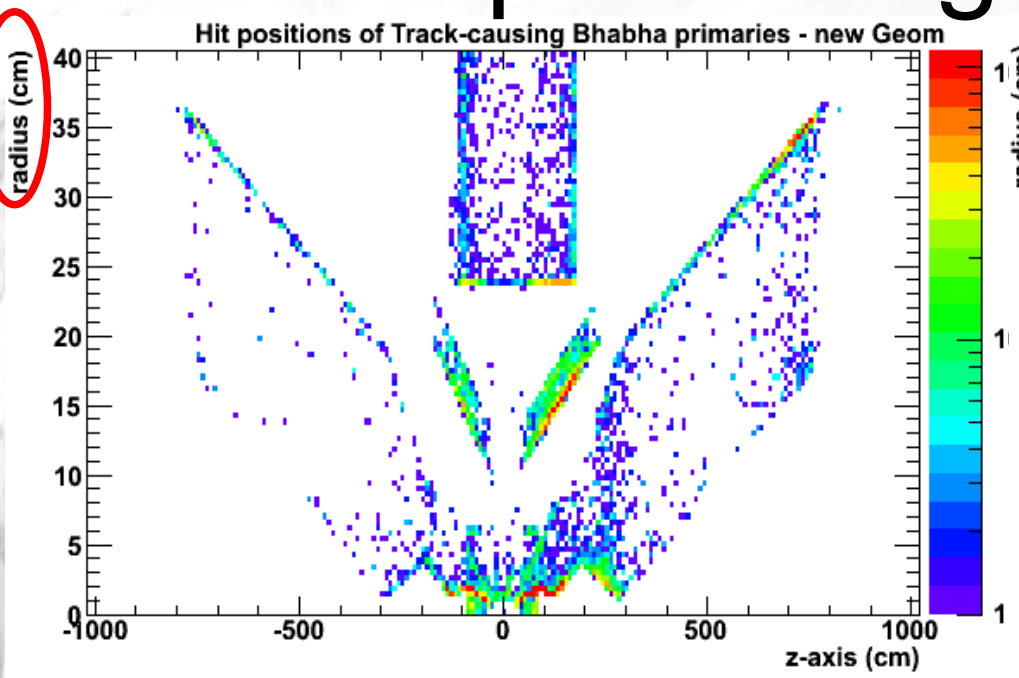


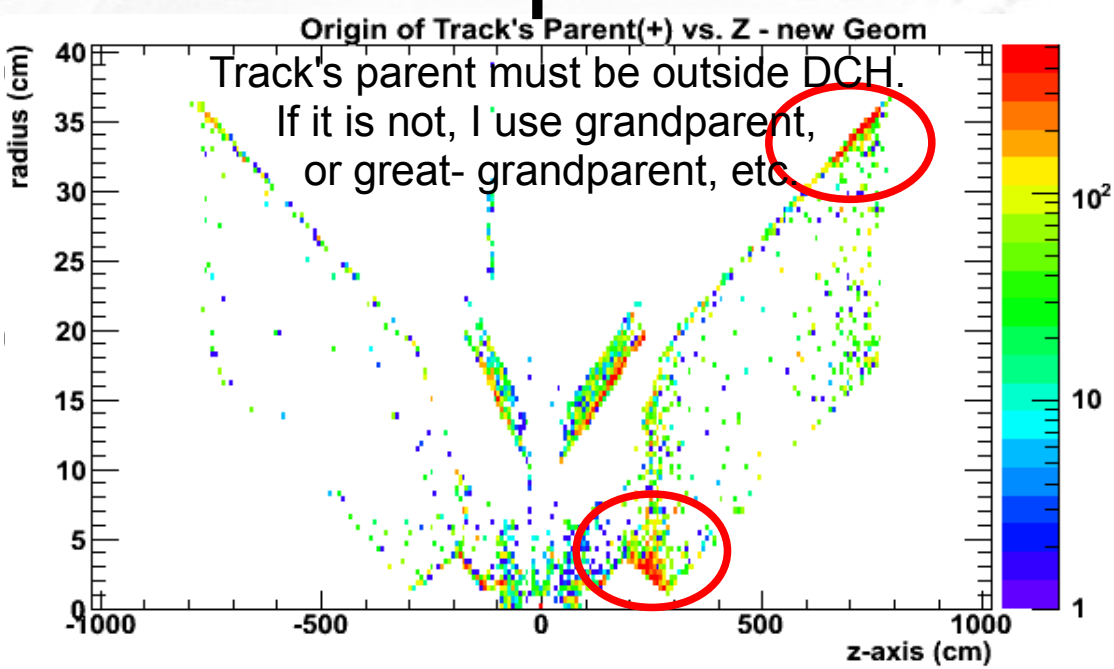
Note: Due to splitting plots into stacked colored “bins” in the above plots, it's possible for two tracks from the same event to double count the occupancy on a wire, resulting in falsely higher occupancies.

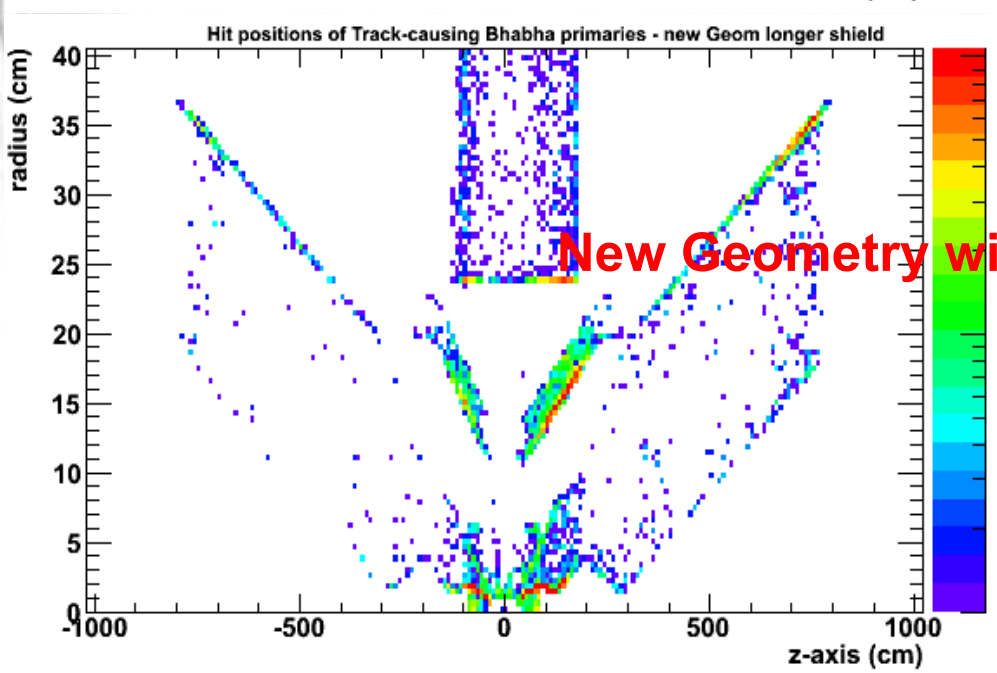




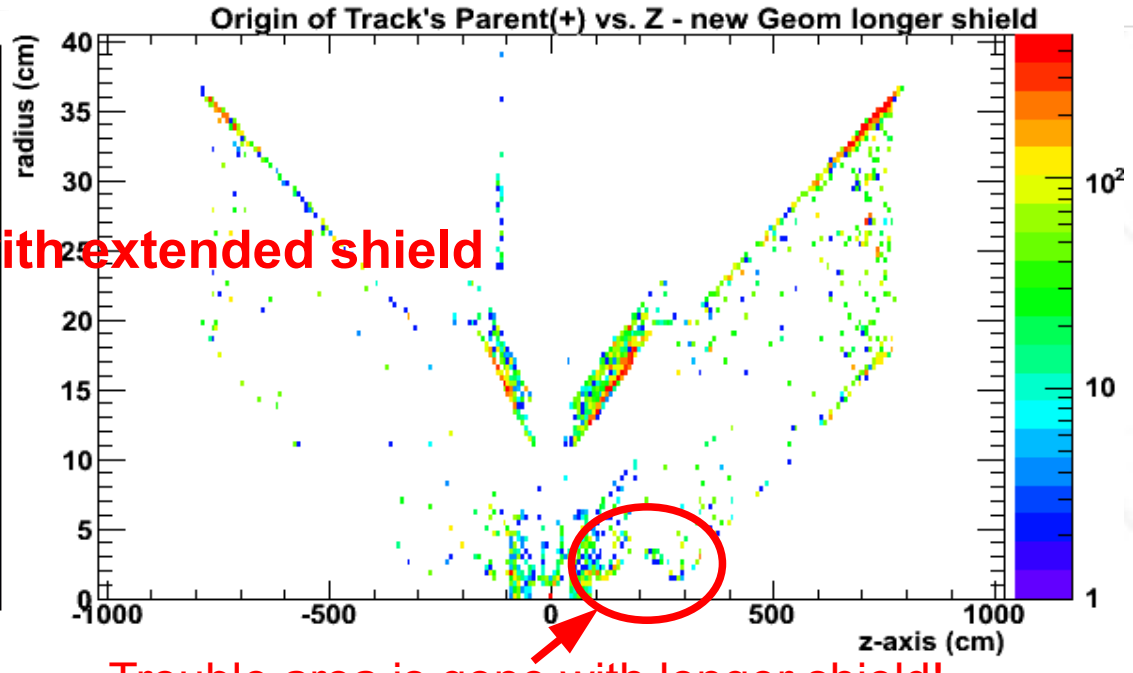
Track-producing Bhabhas/parents





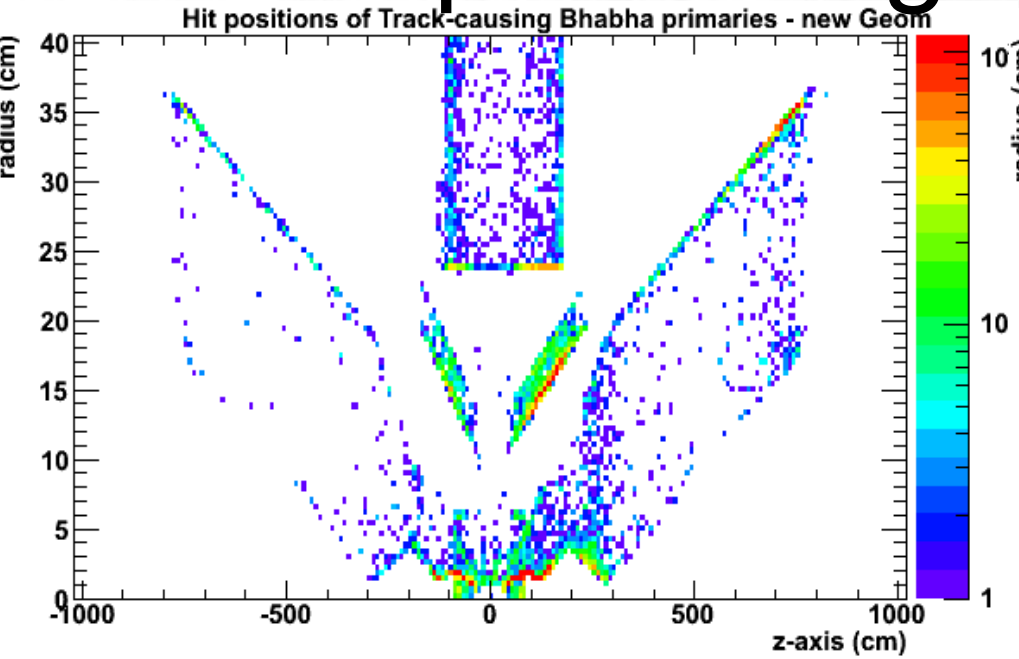


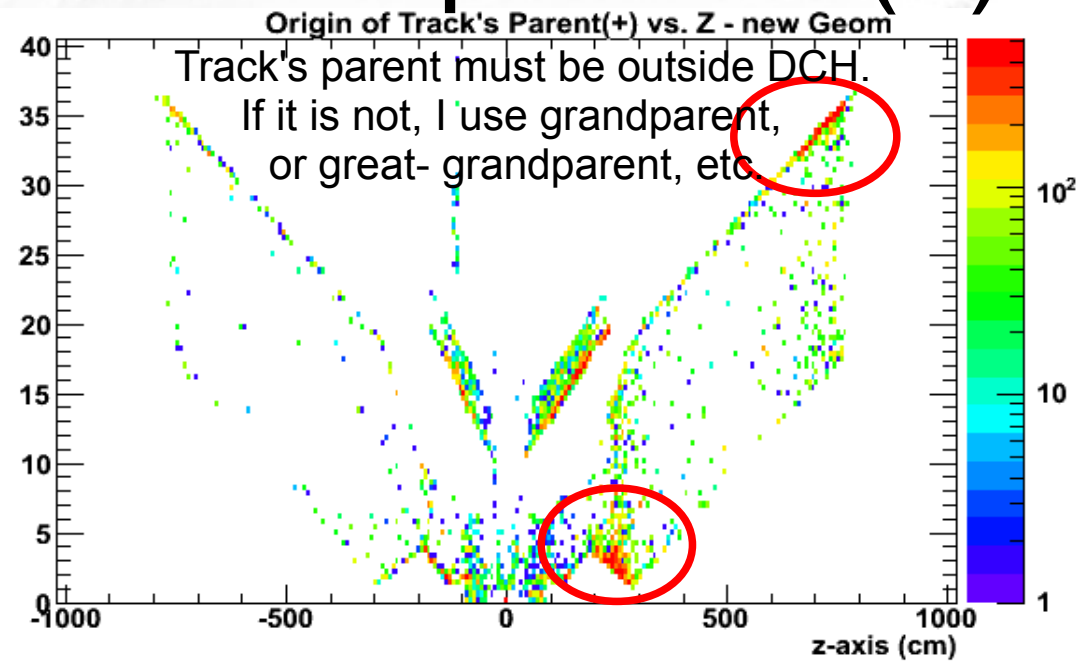
New Geometry with extended shield

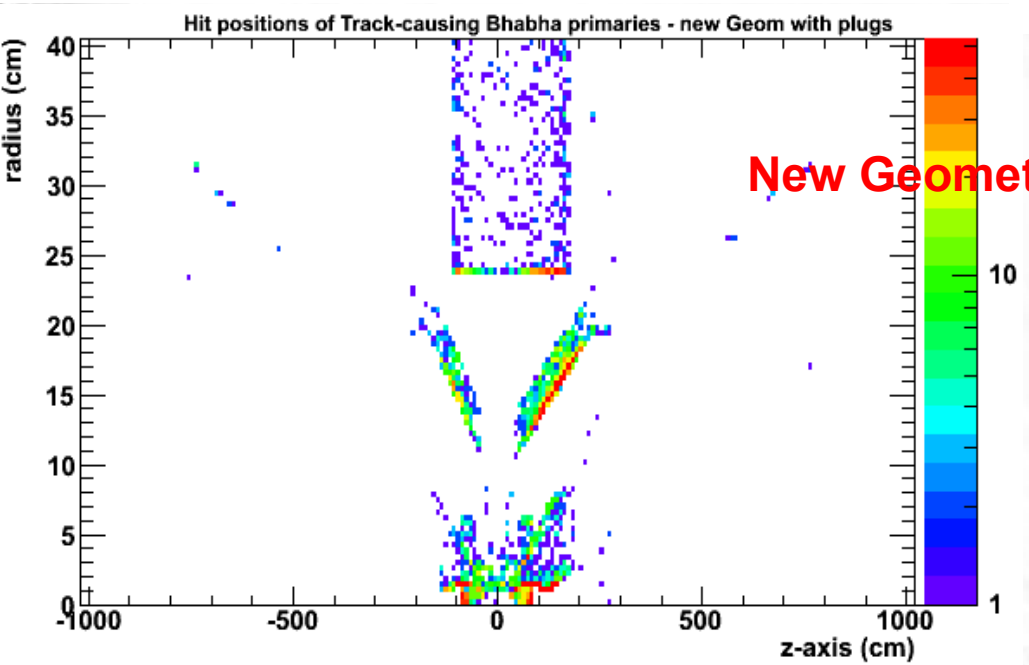


Trouble area is gone with longer shield!

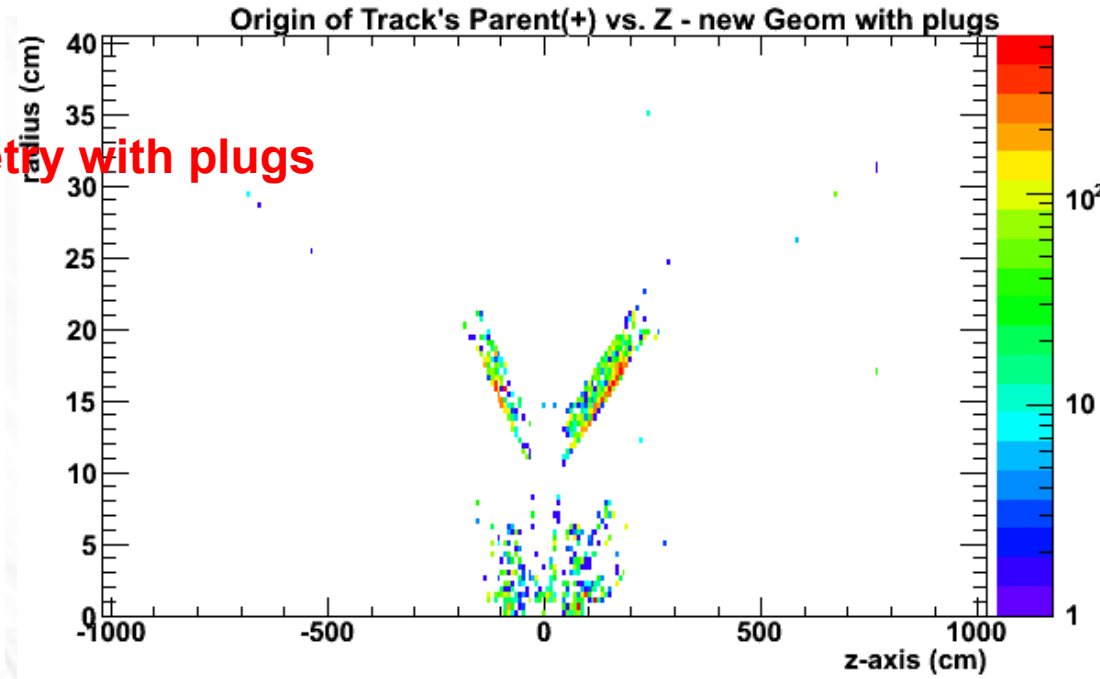
Track-producing Bhabhas/parents (II)



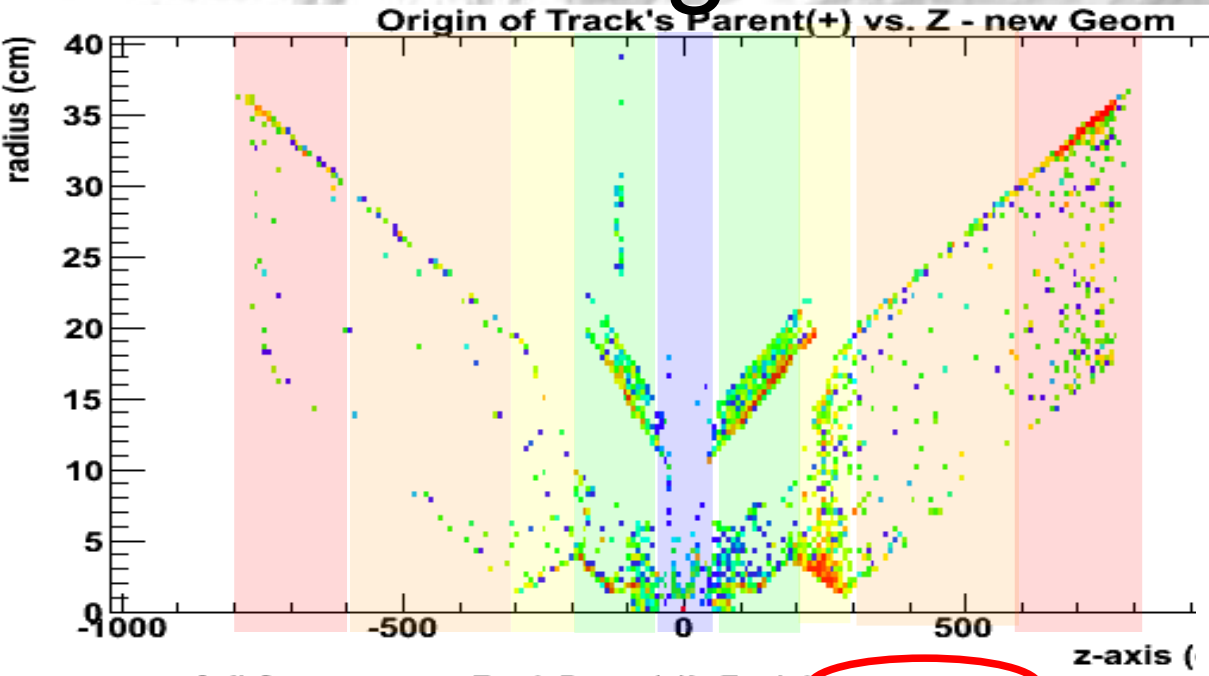


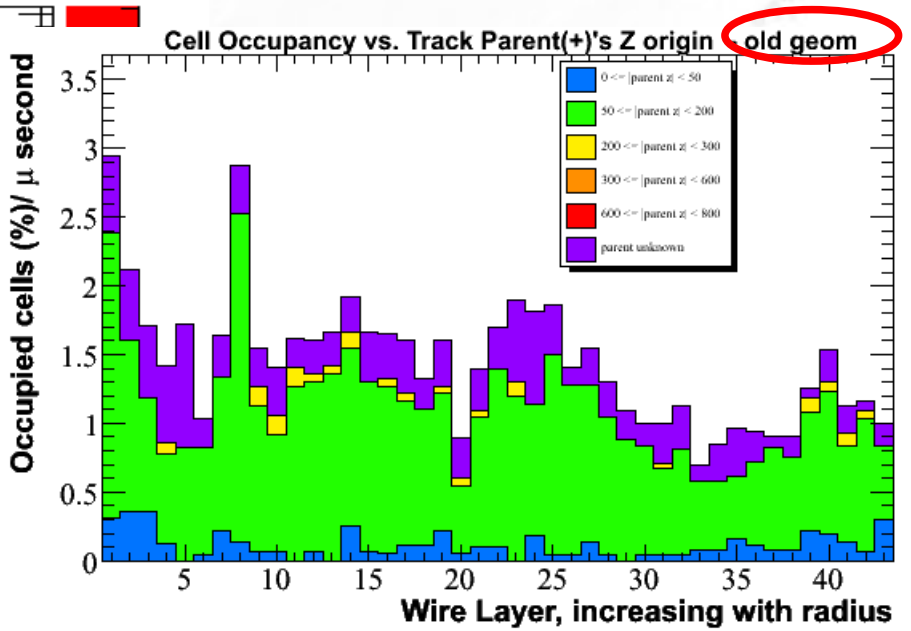


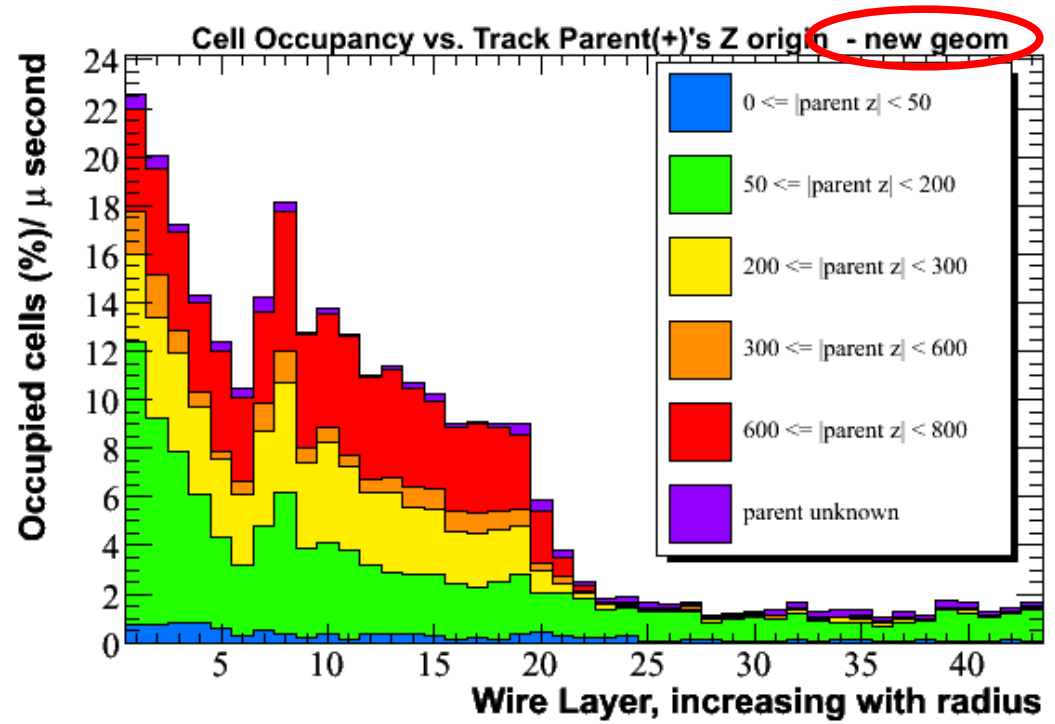
New Geometry with plugs

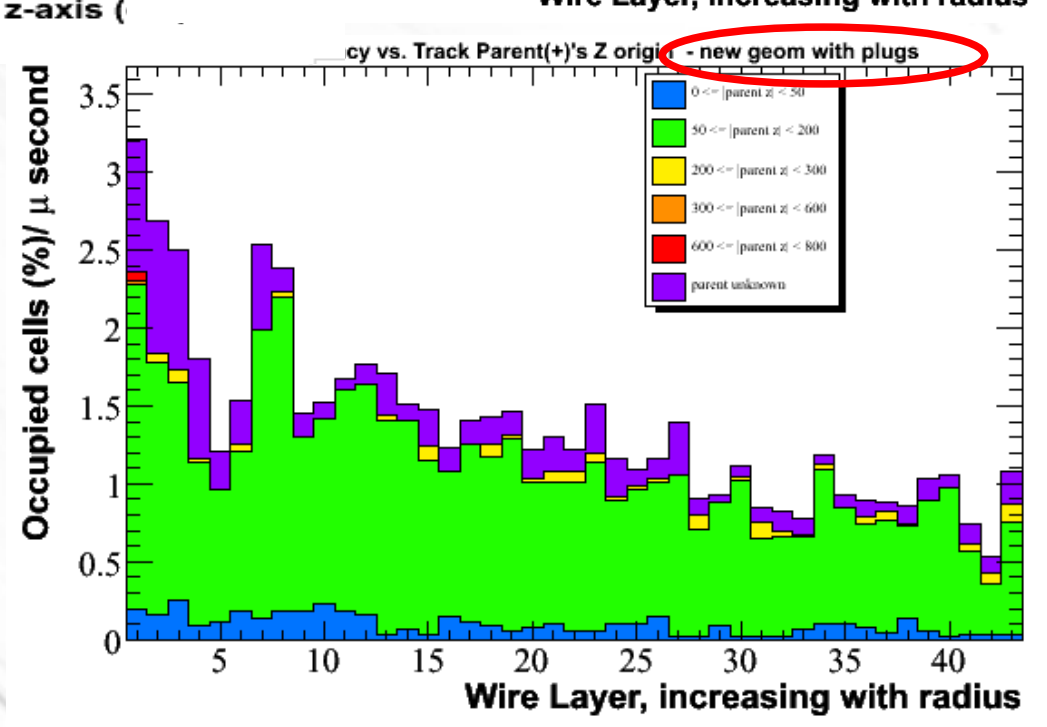


Origin of Occupancy







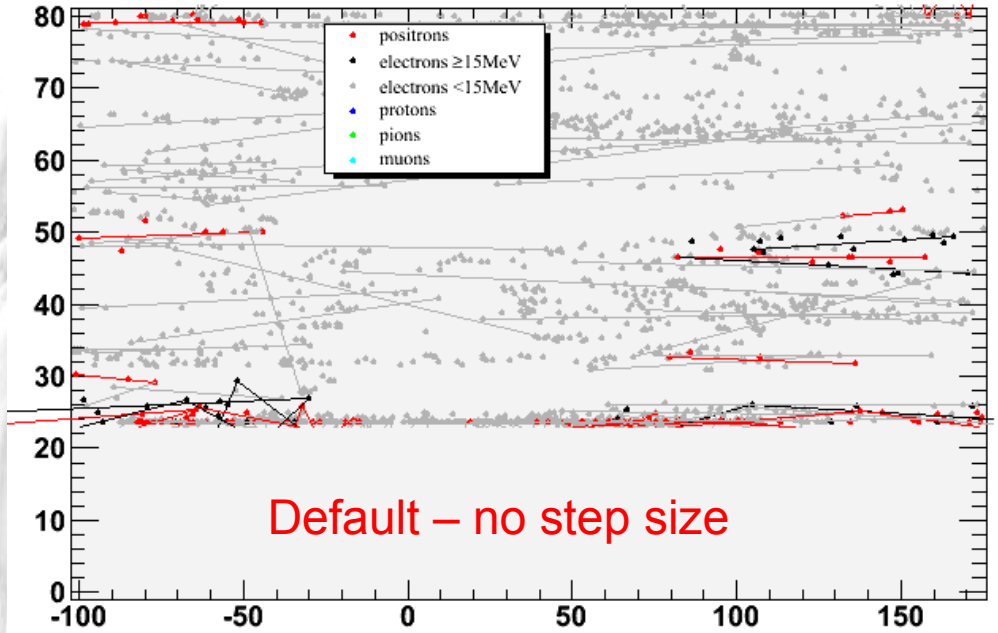


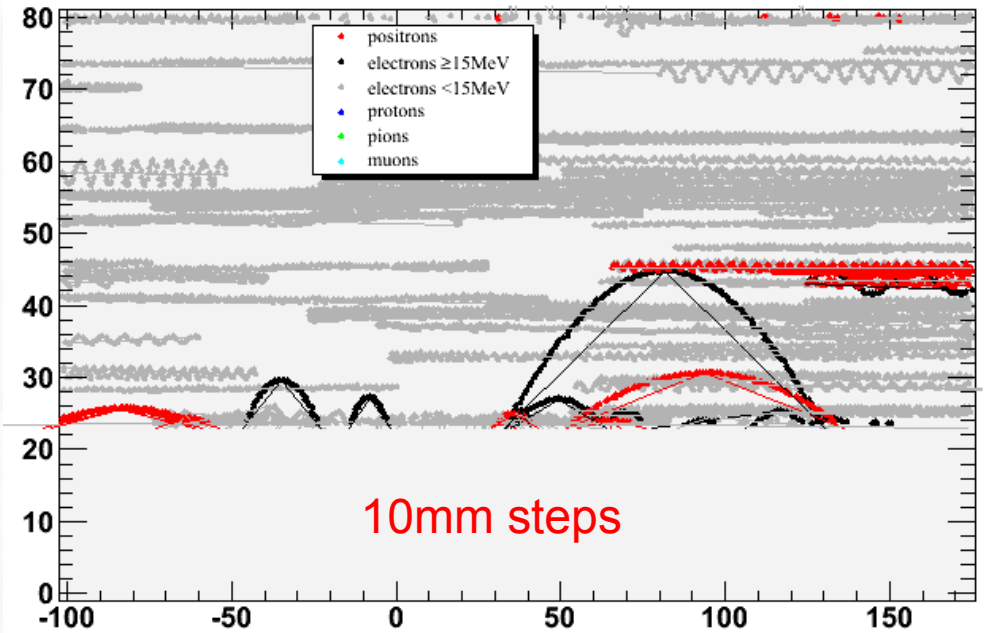
Conclusions

- Extended shield fix and addition of plugs/ horse shoe shielding successfully removes the occupancy increase!

Back-up Slides

Visualization of Step Sizes



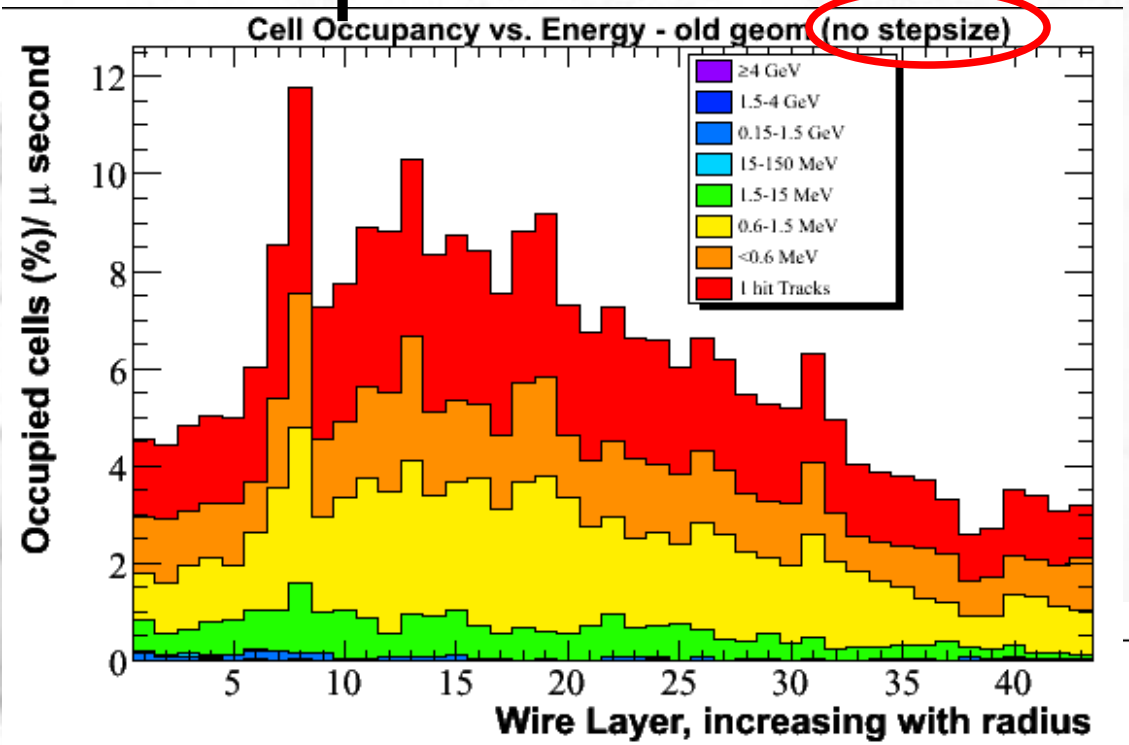


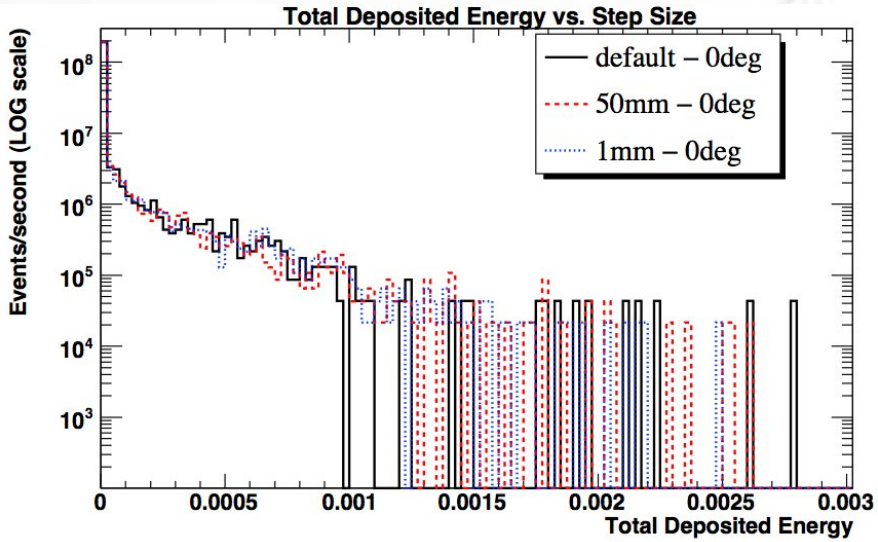
Same 200 events (>5deg) with tracks 1.5MeV < E < 150MeV, hits with deposited E > 0 only

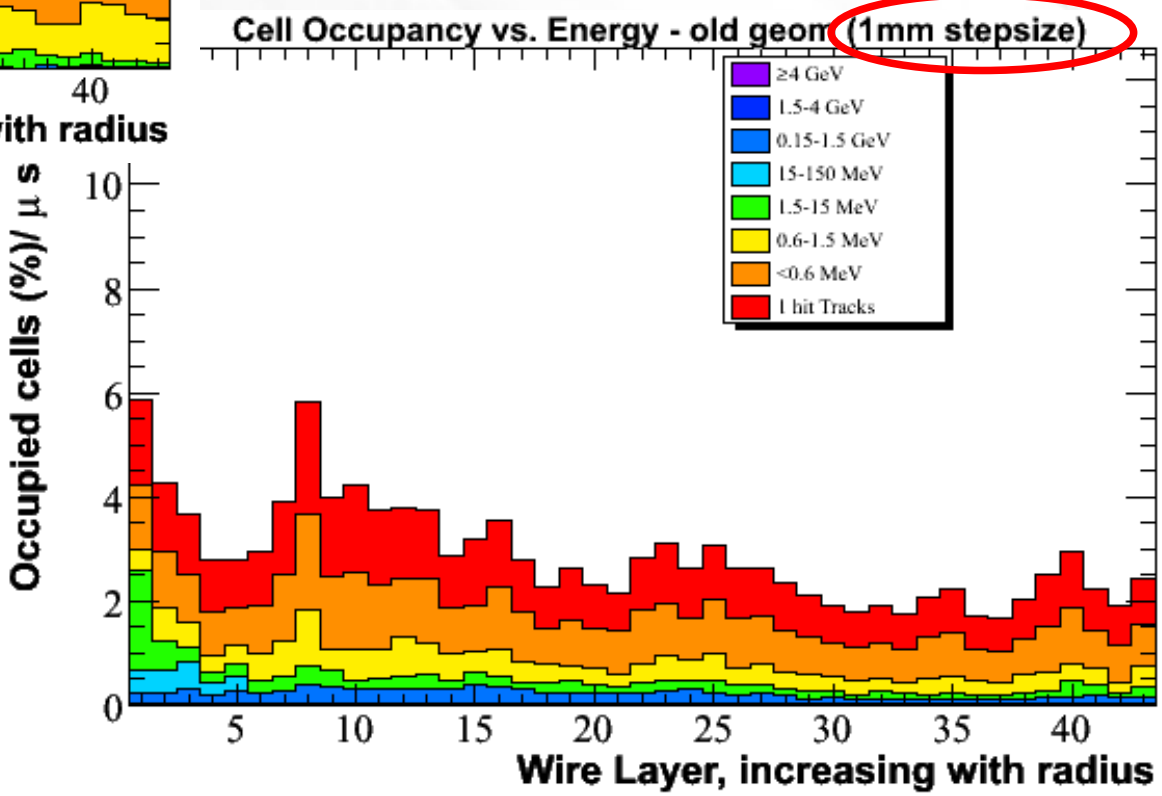
- New occupancy method:

  With smaller step-sizes (1mm Bruno & 10mm Bhwide), each instance of deposited energy counts as one “hit” on whichever wire is closest (axial wires only). Only one hit/wire/event is allowed.

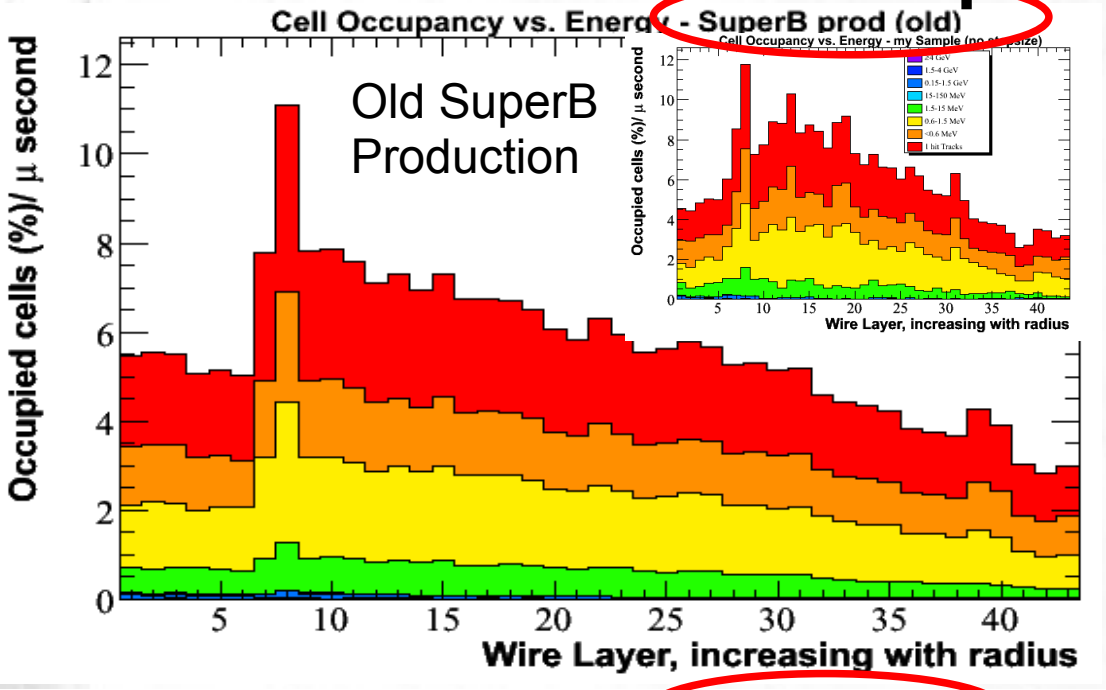
Step Size vs. Occupancy (old geom)

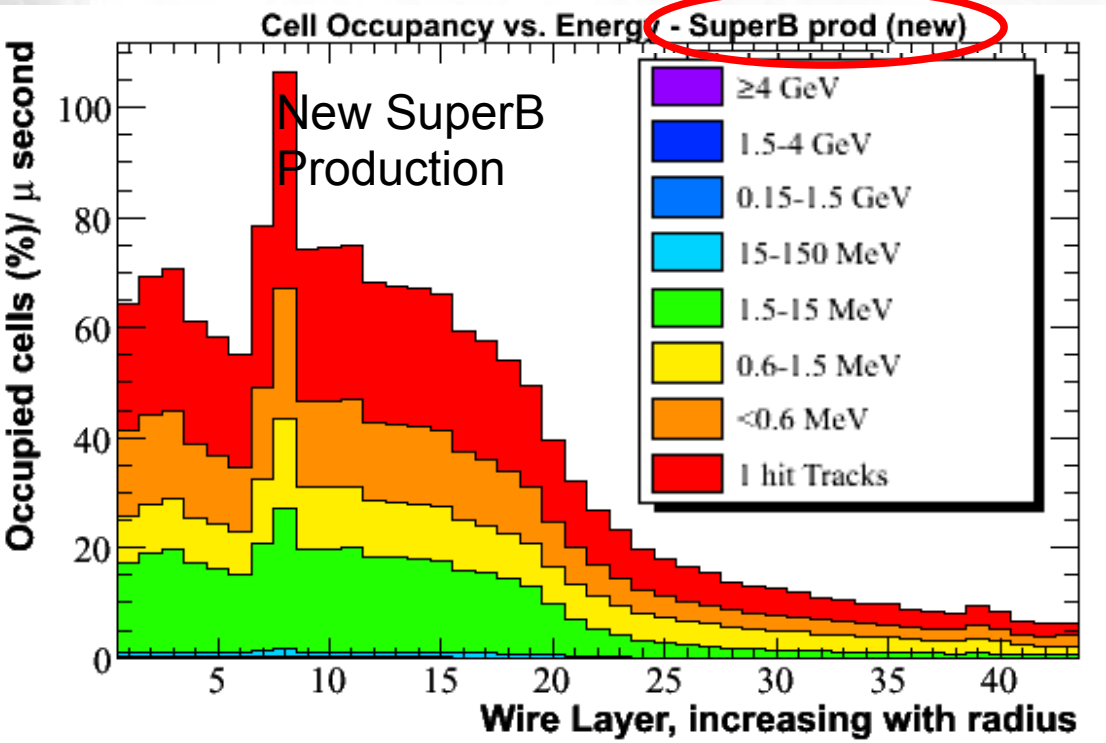


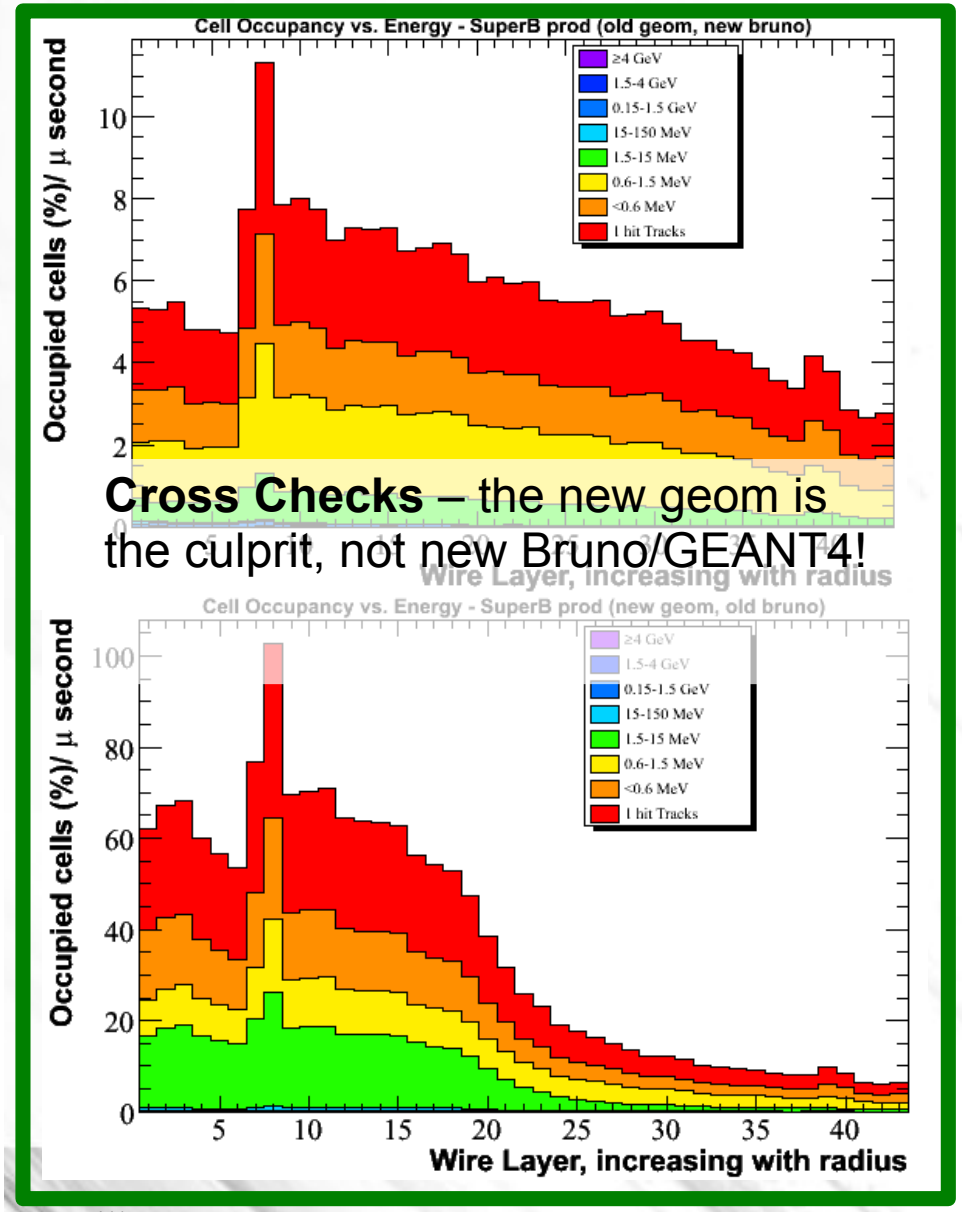




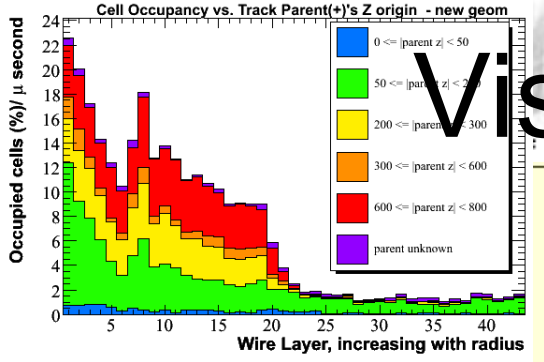
New vs. Old SuperB Productions

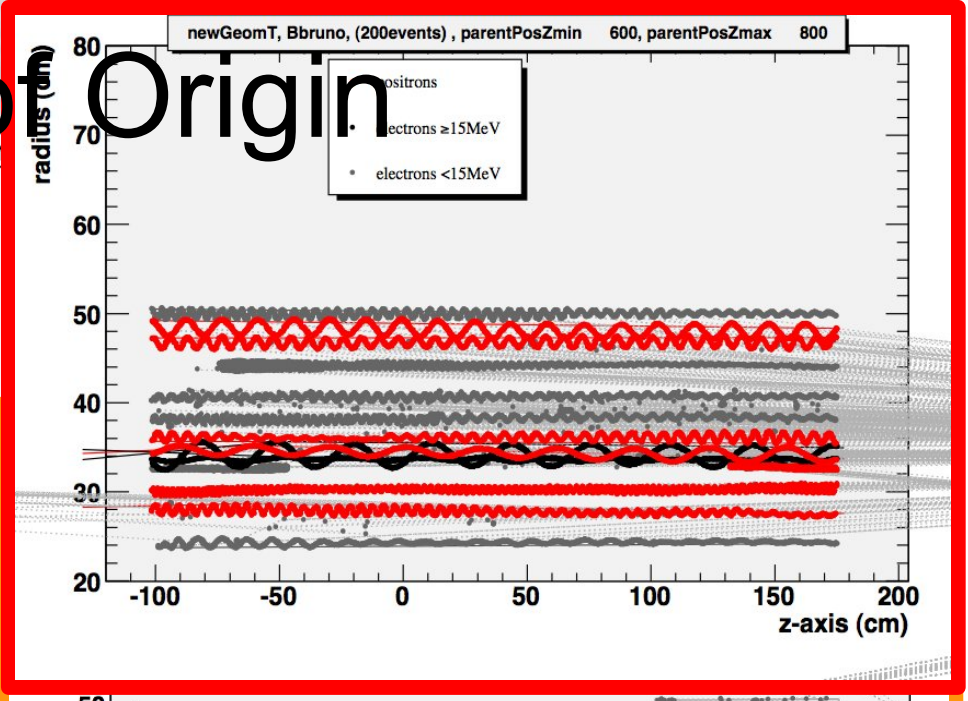


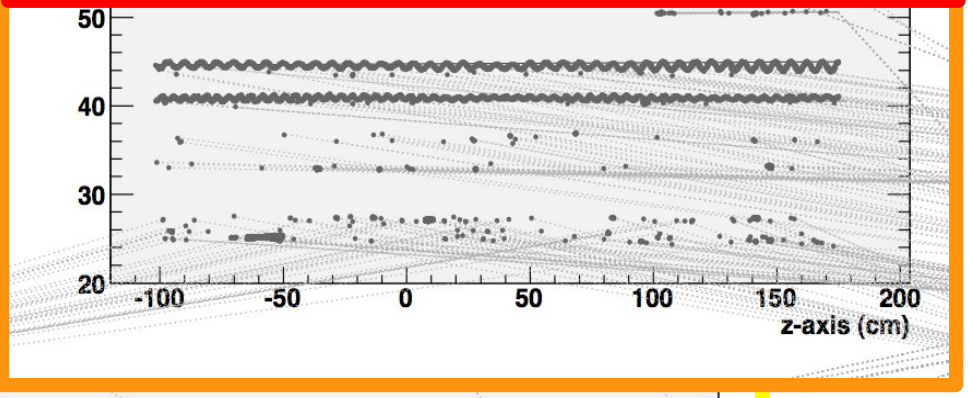


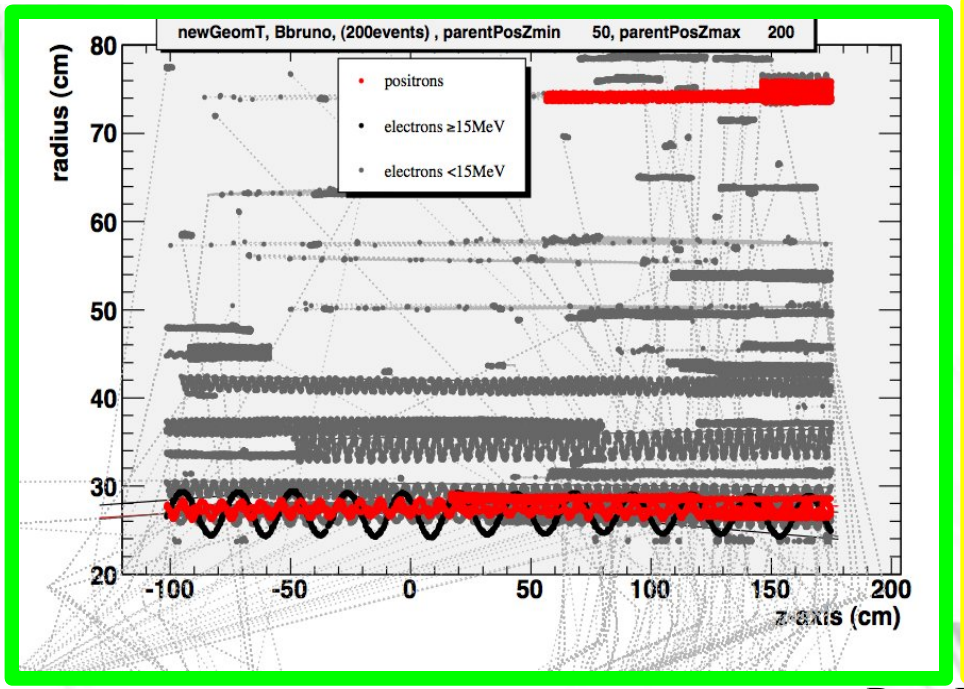


Visualization of Origin

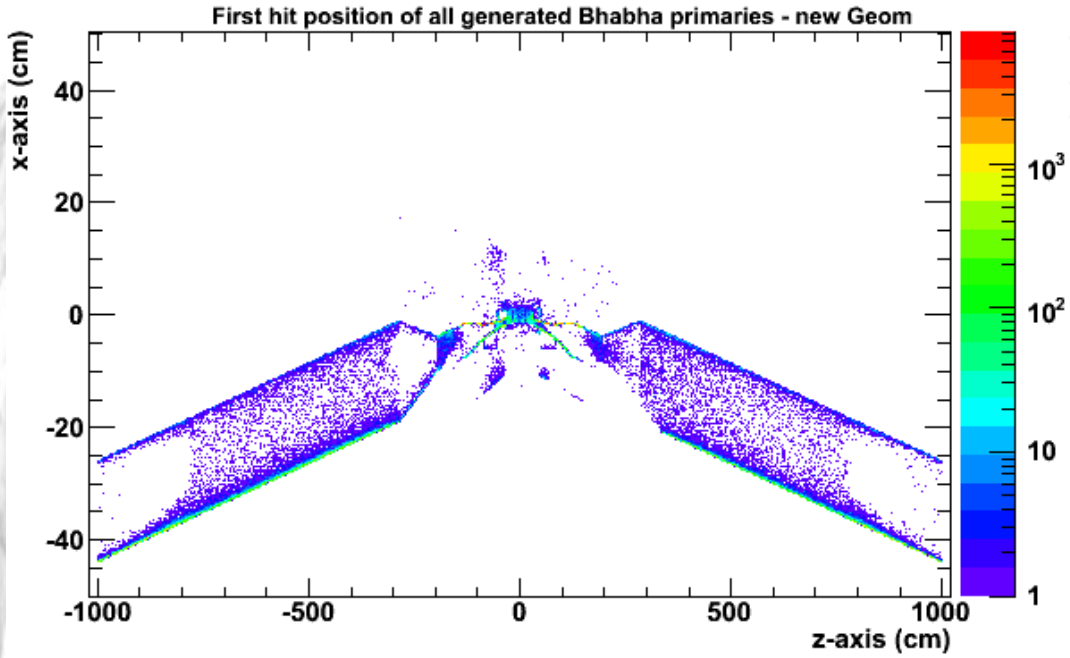


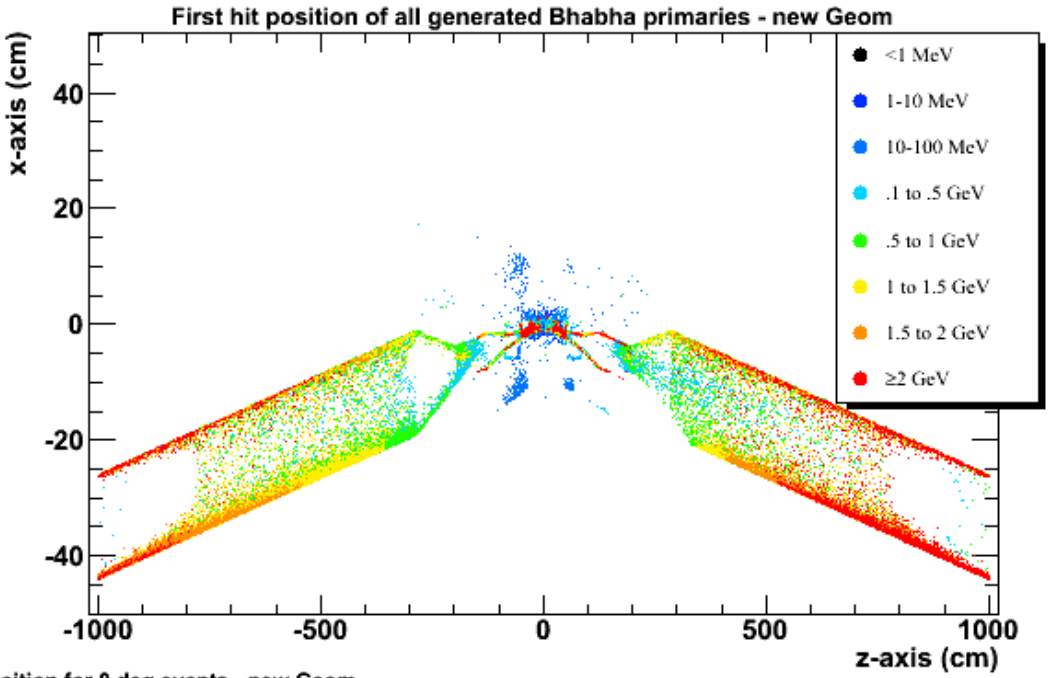


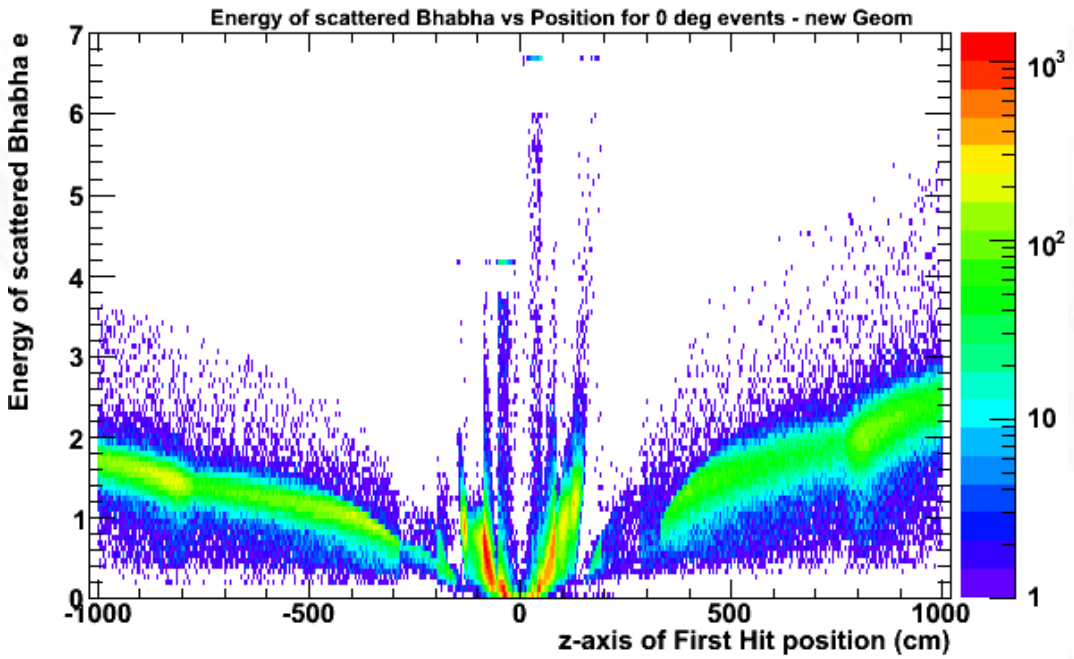




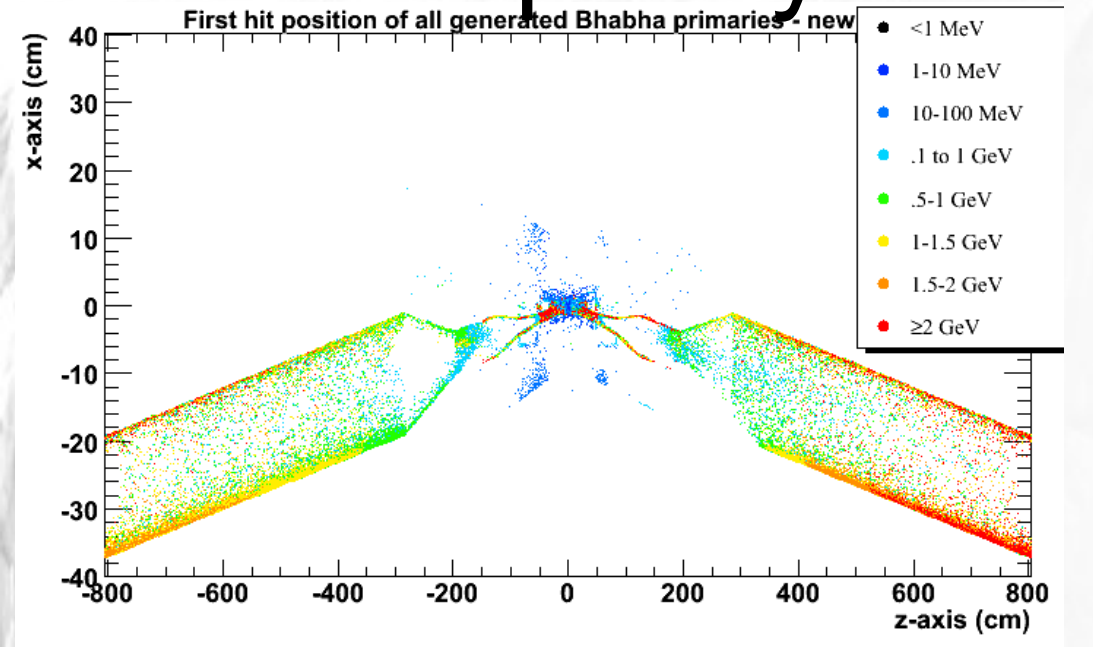
Where Bhabhas First hit the pipe

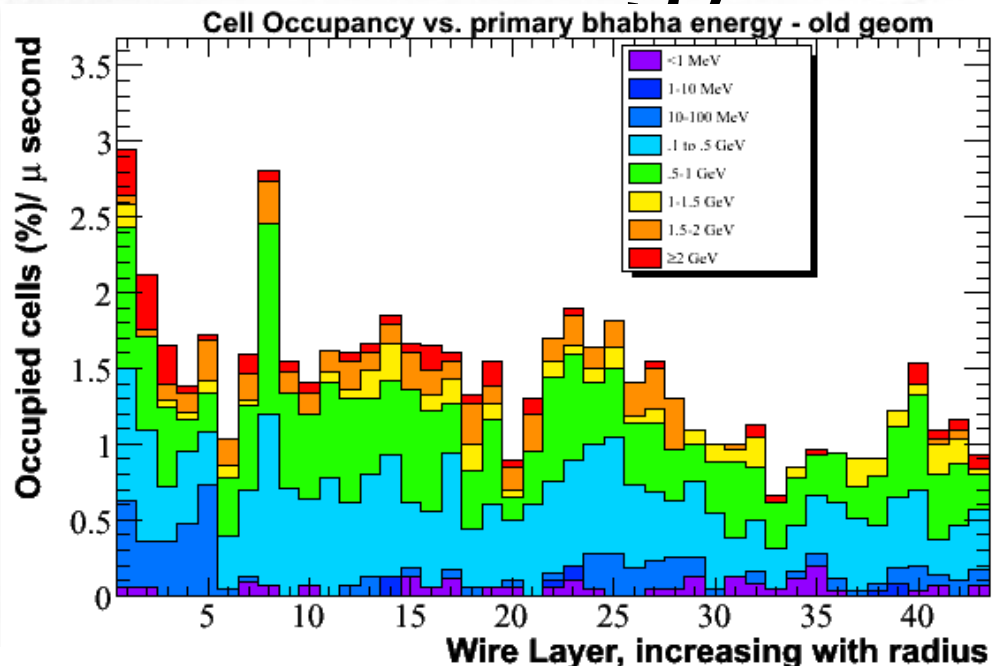


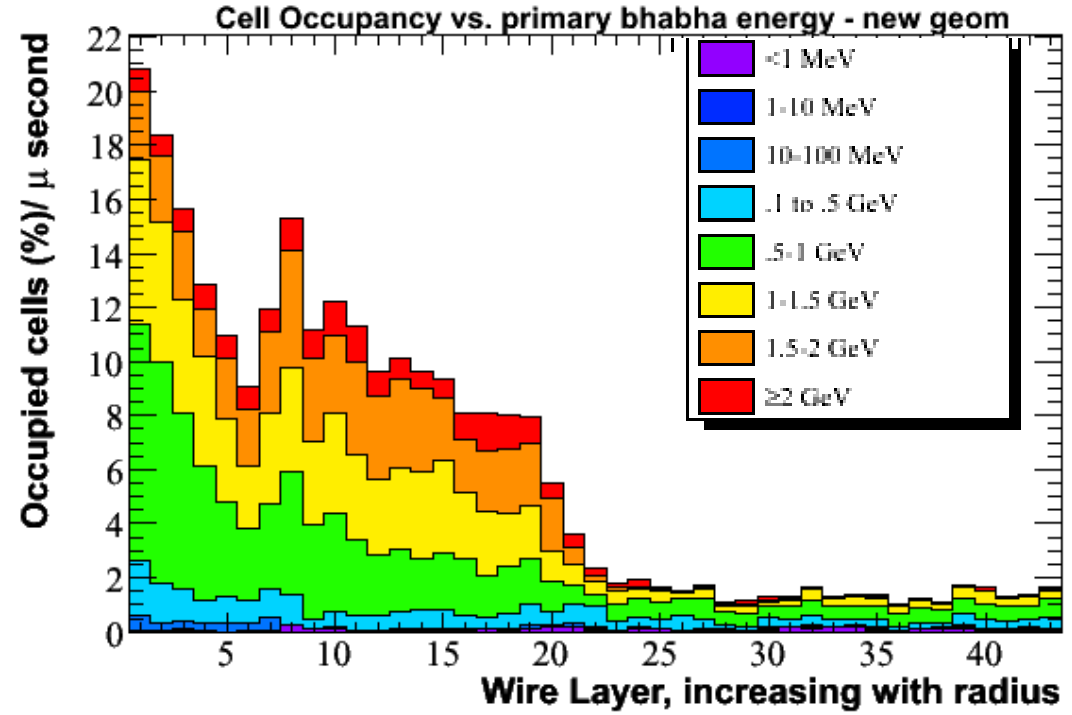


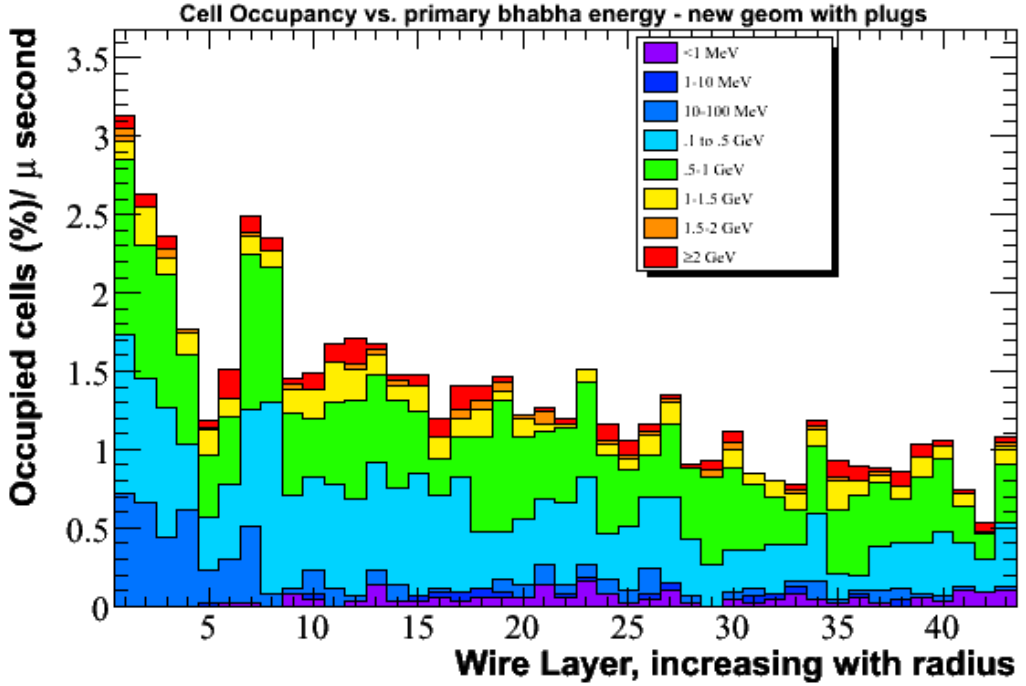


Occupancy vs. Bhabha energy



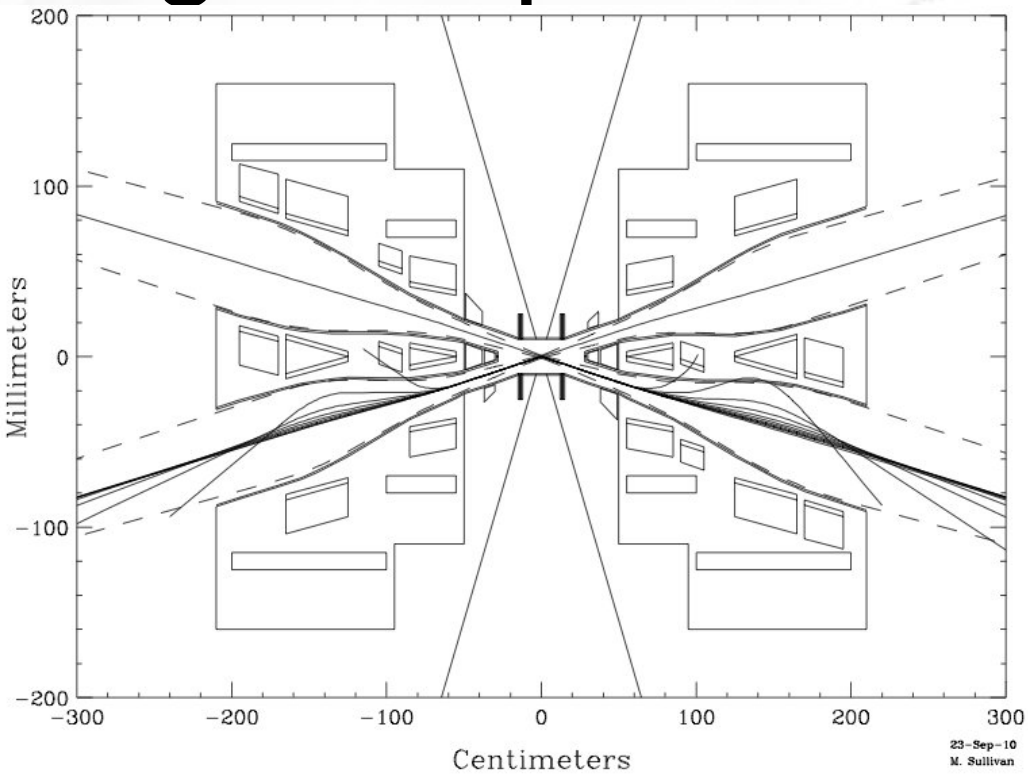


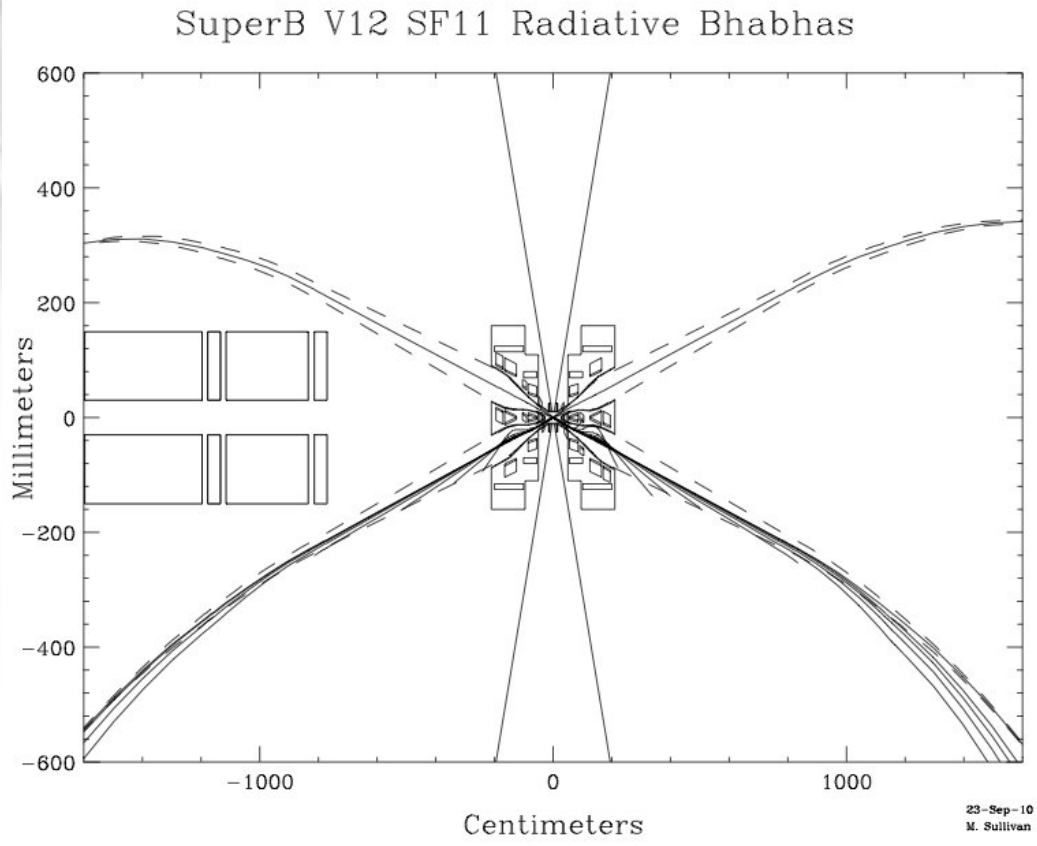




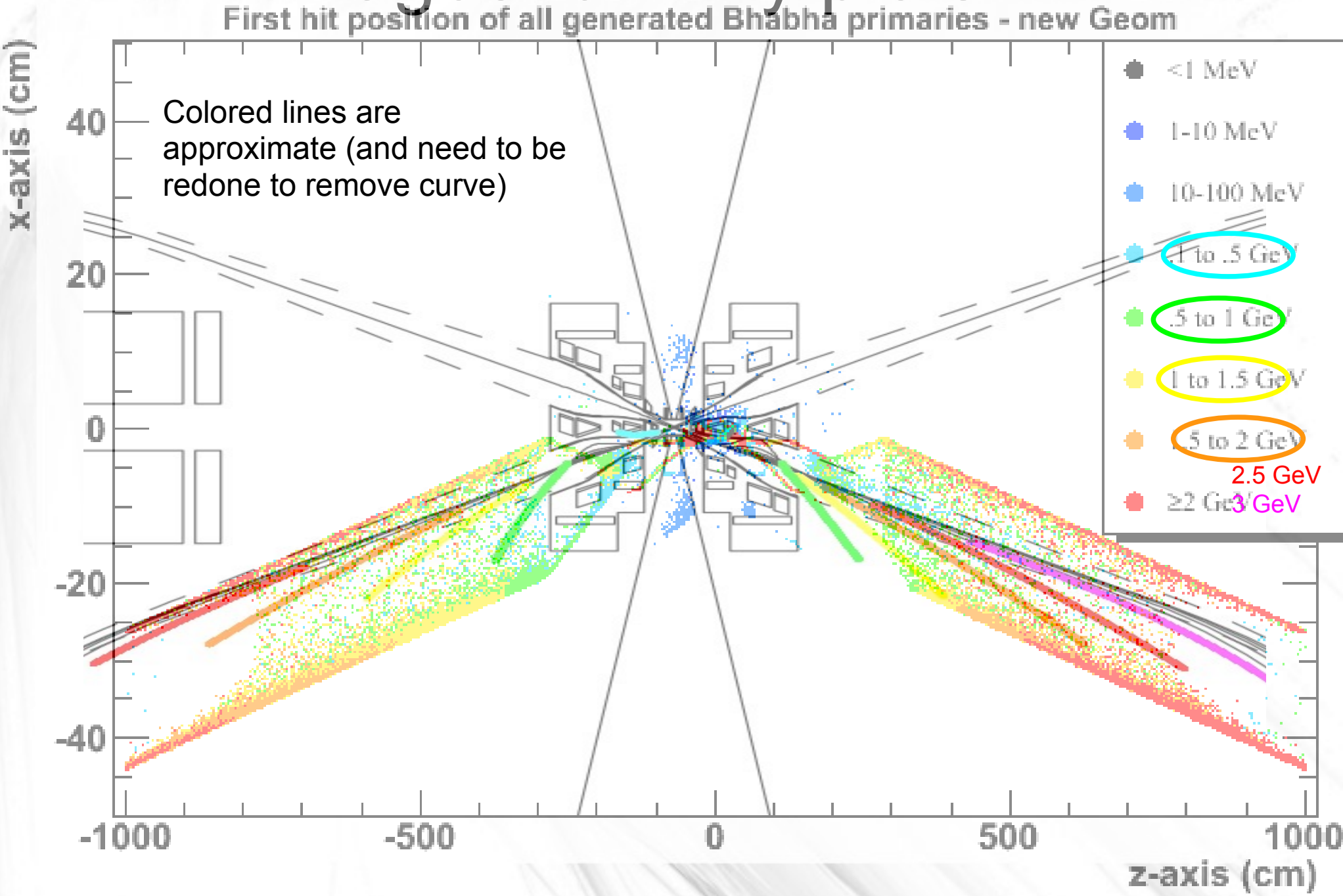
Mike Sullivan's Magbend plots

Plot show 0.5-4 GeV in 0.5 increments

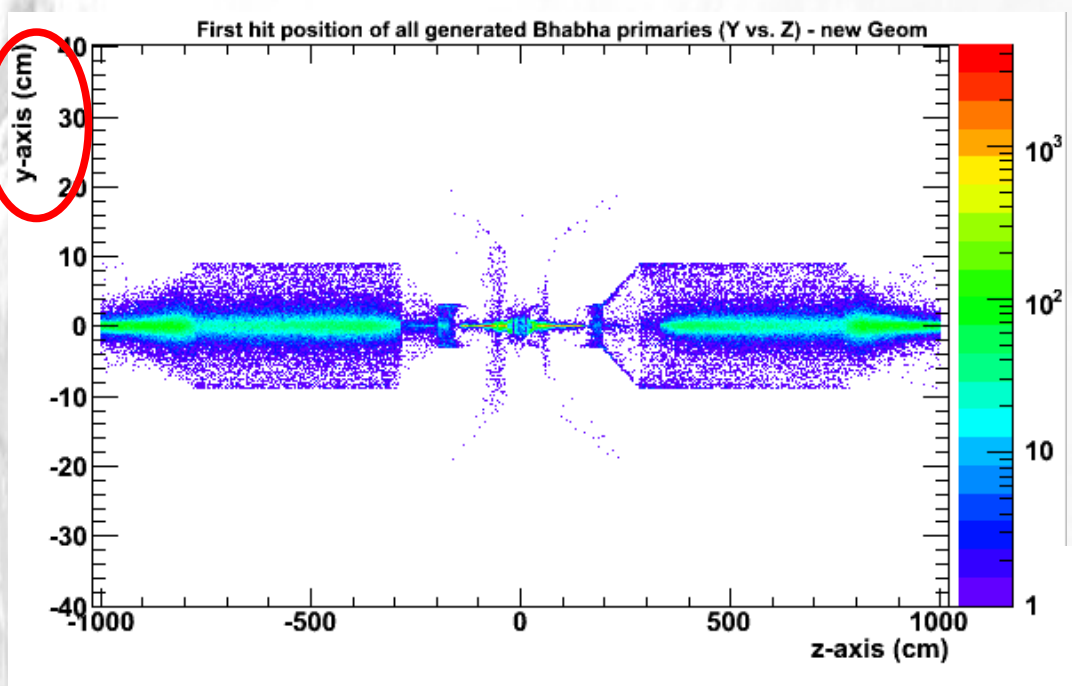


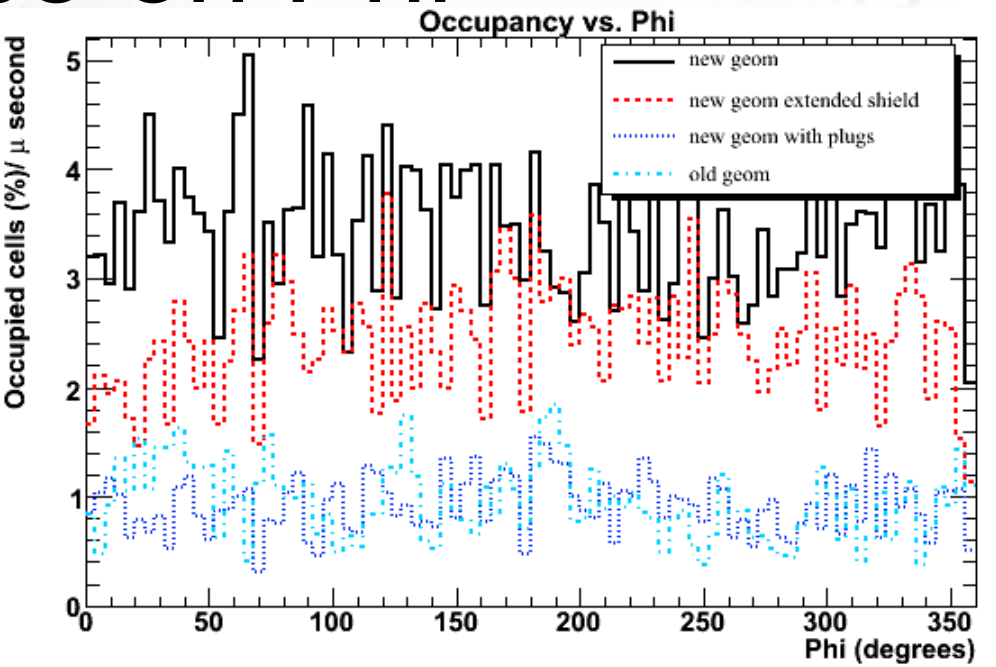


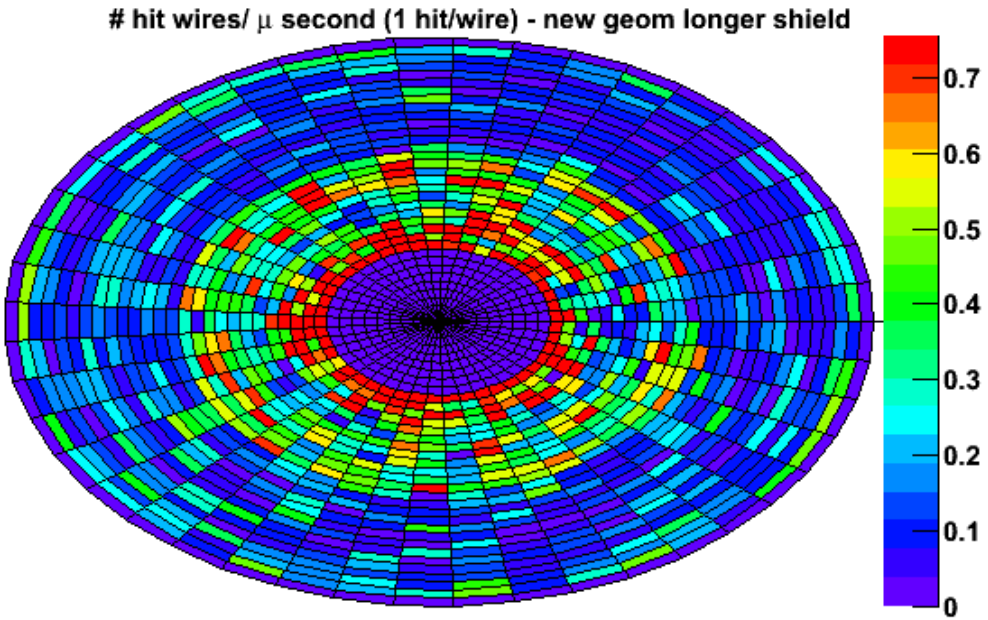
Magbend + My plots



Dependence on Phi







Question about Angle

- FastSim is using 33mrad crossing angle
- I believe FullSim is using 30mrads. Can this be confirmed?