

# CDC Simulation Studies For Geometries C, E, F, & G

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David Lawrence JLab

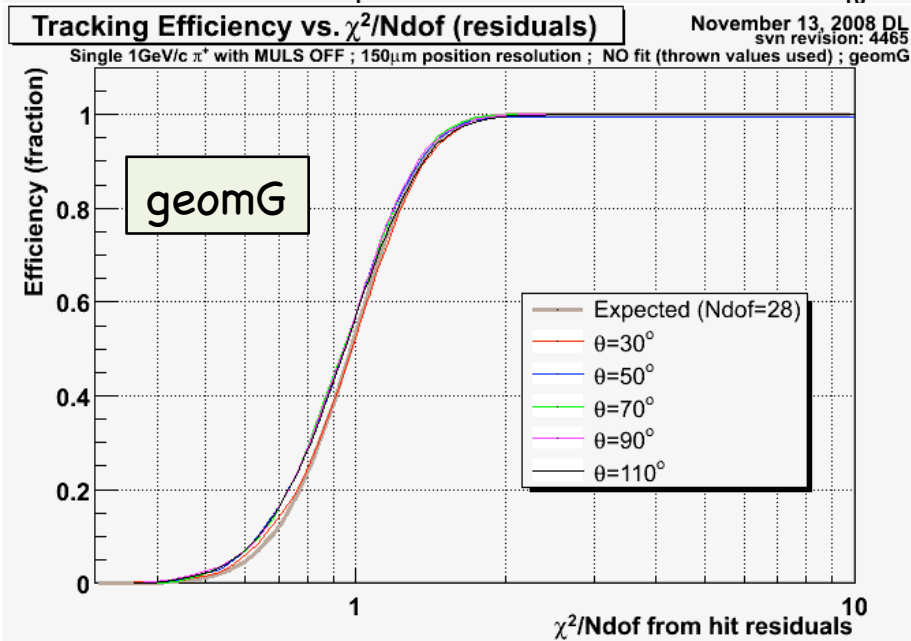
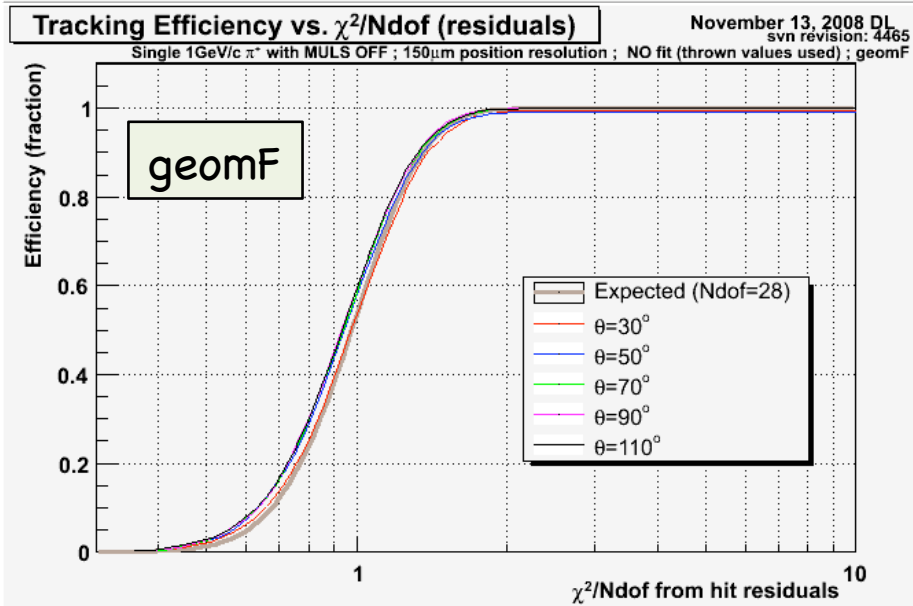
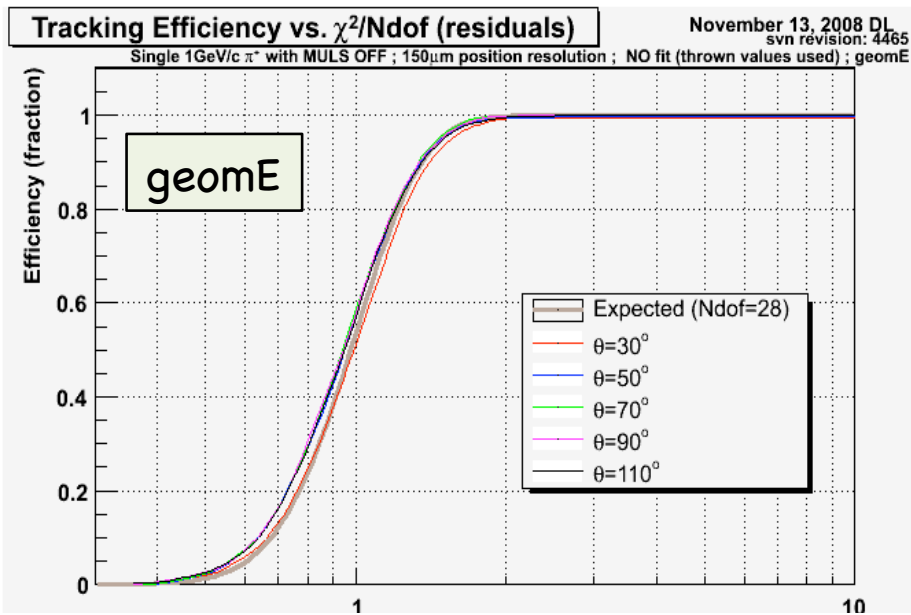
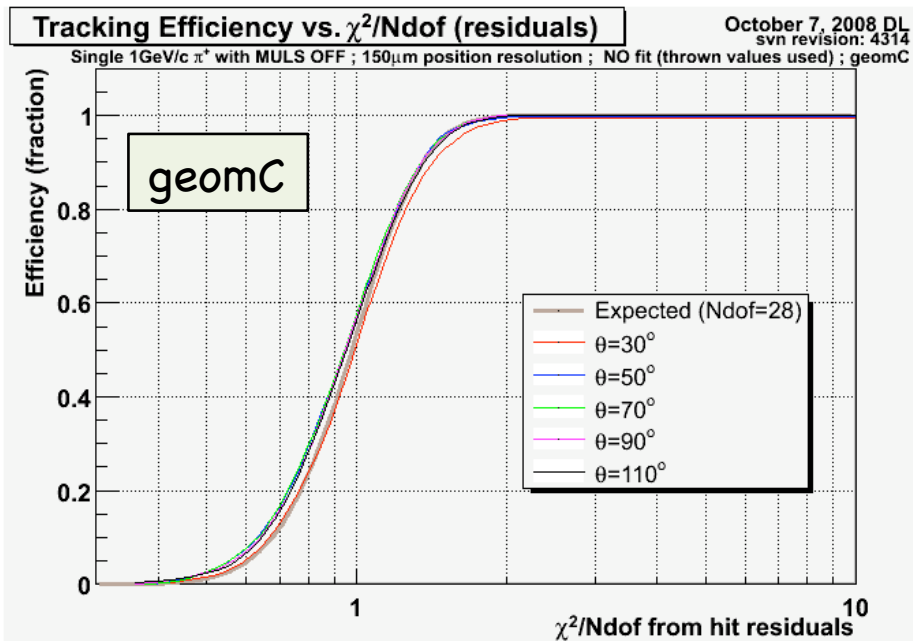
# 3 New Geometries Studied

These represent the axial/stereo configurations that will be studied via simulation. The orientation is listed from outermost layer (top) to innermost layer (bottom).

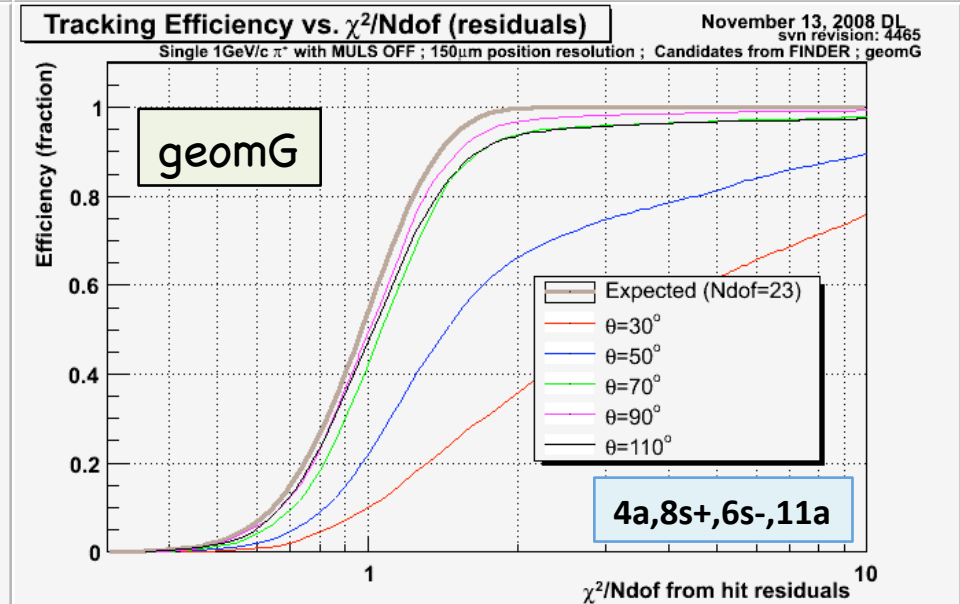
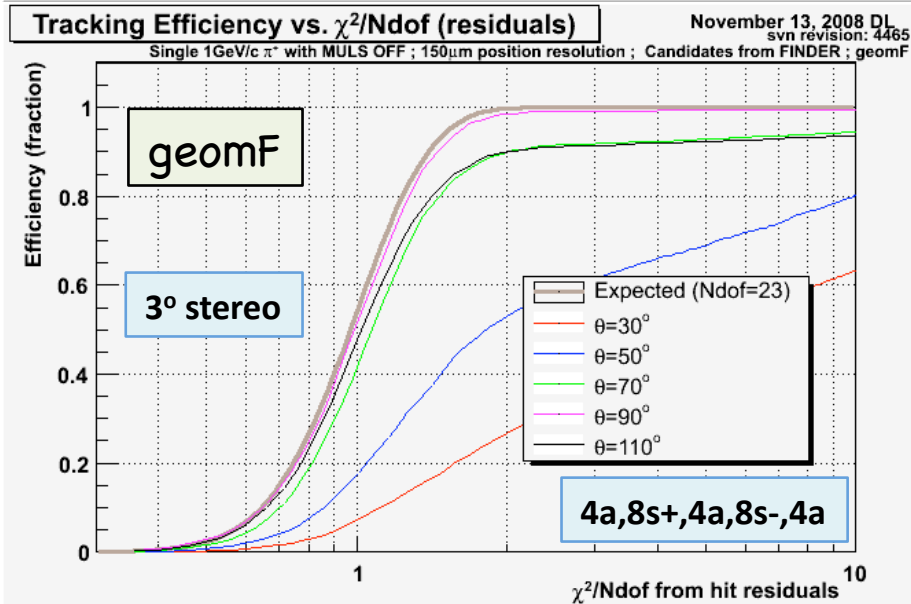
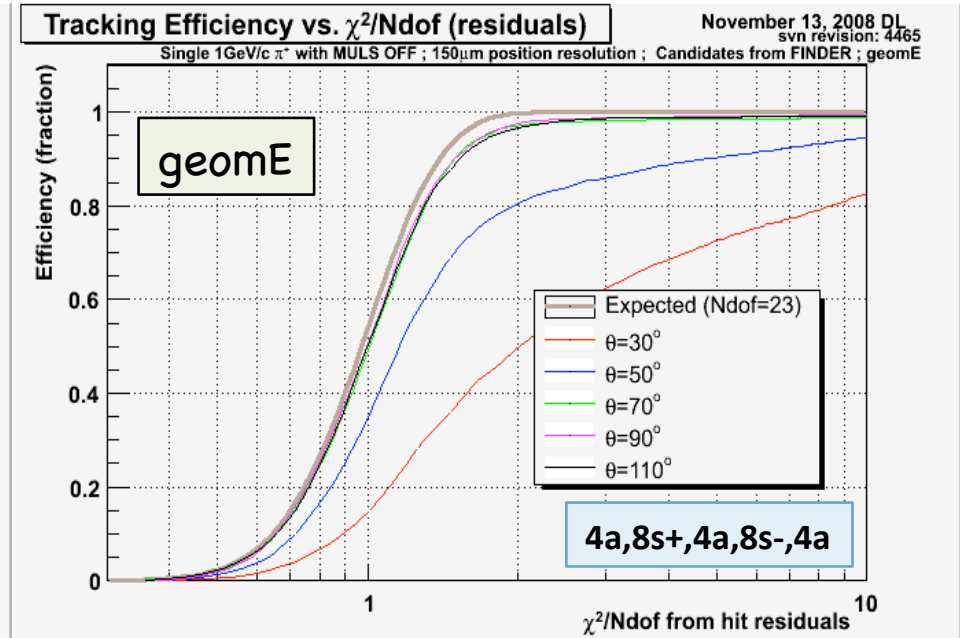
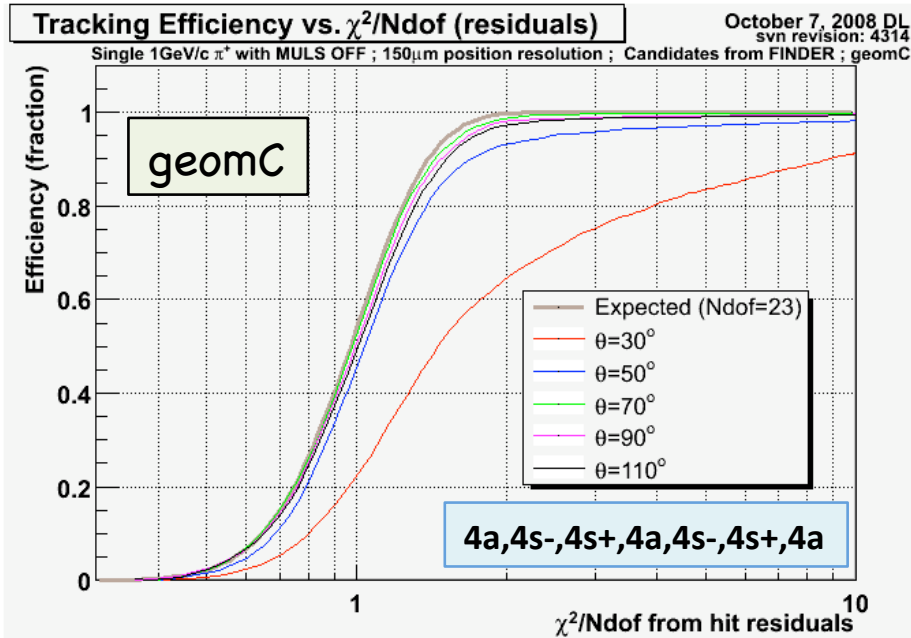
Relative  $\phi$ -shifts between layers is implemented in all designs for axial wires. Stereo wires are also  $\phi$ -shifted for geometries "C" and "D".

Geometry A	Geometry B	Geometry C	Geometry D	Geometry E	Geometry F	Geometry G
8 axial	8 axial	4 axial	3 stereo $-6^\circ$	4 axial	4 axial	11 axial
2 stereo $+6^\circ$	4 stereo $+6^\circ$	4 stereo $+6^\circ$	8 axial	8 stereo $-6^\circ$	8 stereo $-3^\circ$	6 stereo $-6^\circ$
2 stereo $-6^\circ$	5 axial	4 stereo $-6^\circ$	4 stereo $+6^\circ$	4 axial	4 axial	8 stereo $+6^\circ$
5 axial	4 stereo $-6^\circ$	4 axial	4 axial	8 stereo $+6^\circ$	8 stereo $+3^\circ$	4 axial
2 stereo $+6^\circ$	3 axial	4 stereo $+6^\circ$	4 stereo $-6^\circ$	4 axial	4 axial	
2 stereo $-6^\circ$		4 stereo $-6^\circ$	4 axial			
3 axial		4 axial				

# Cumulative $\chi^2/Ndof$ for "Truth" tracks

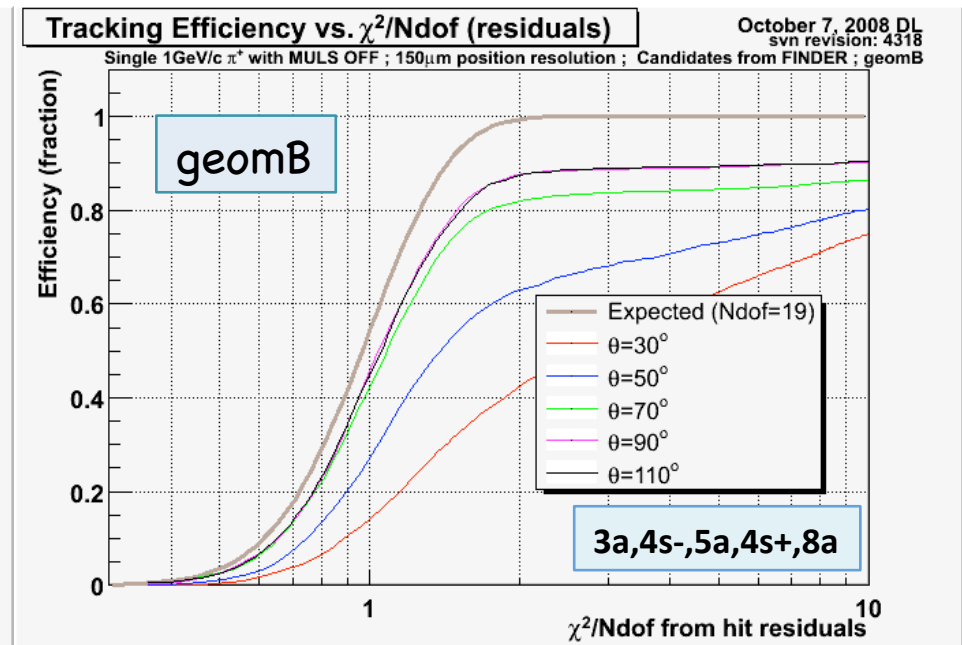
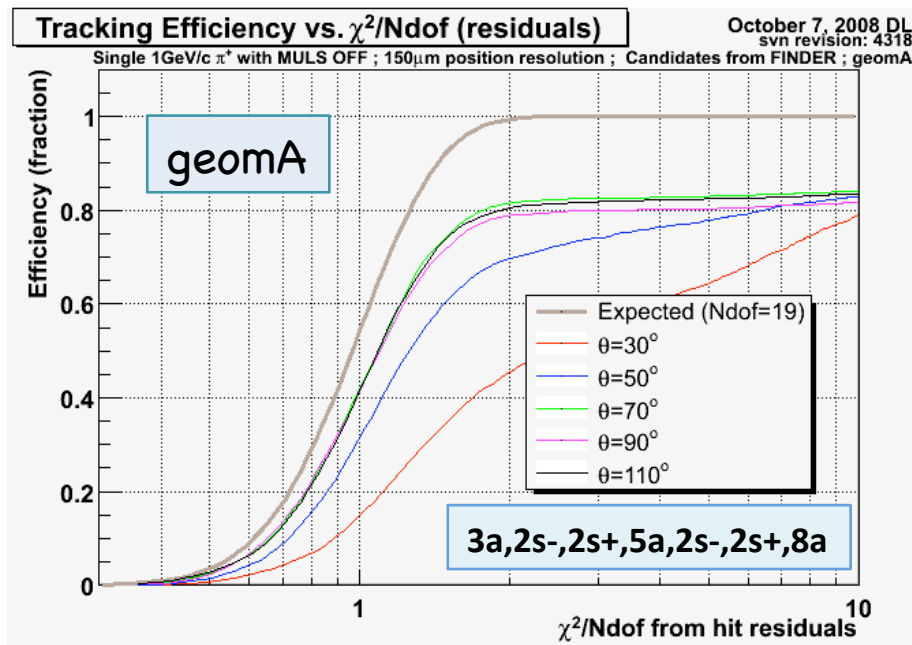


# Full Reconstruction



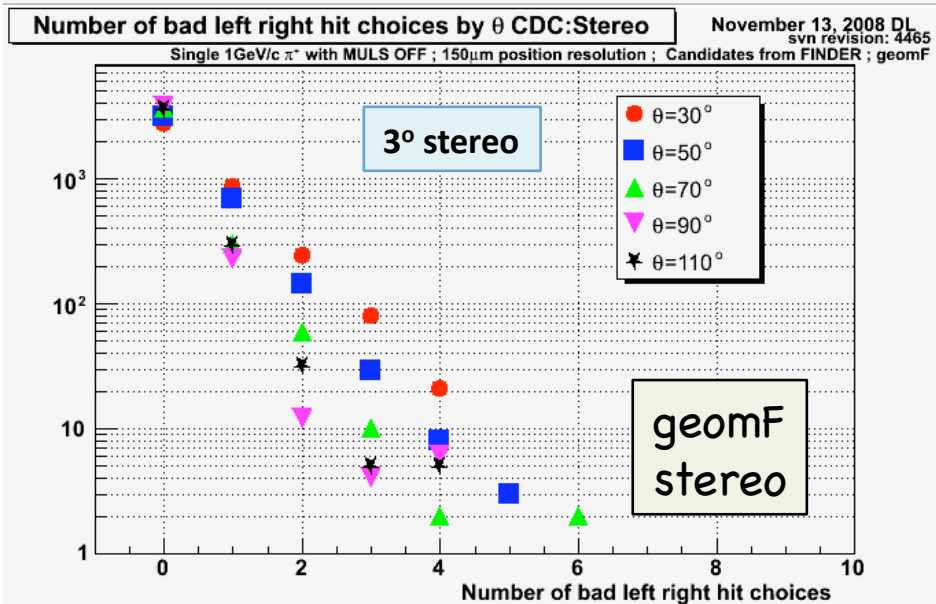
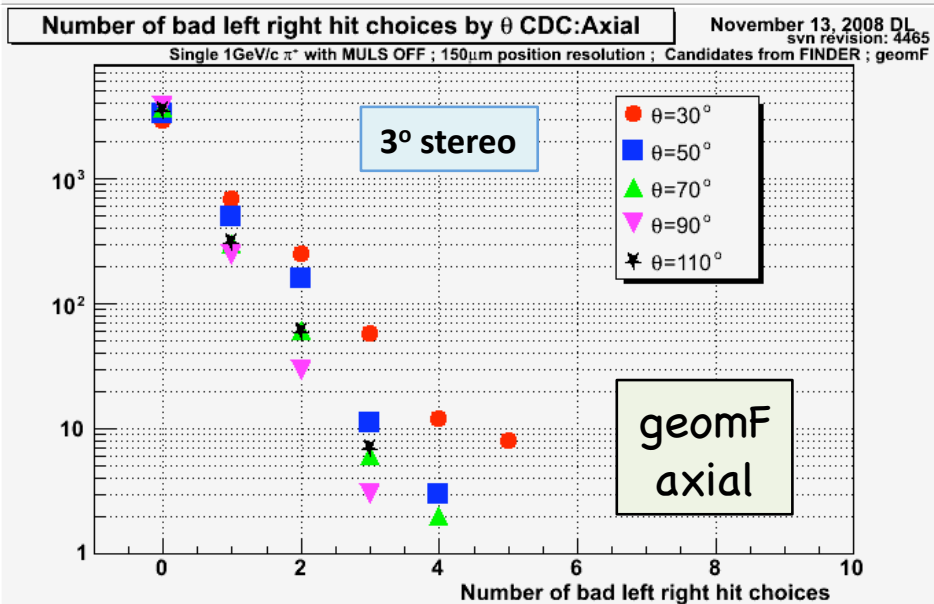
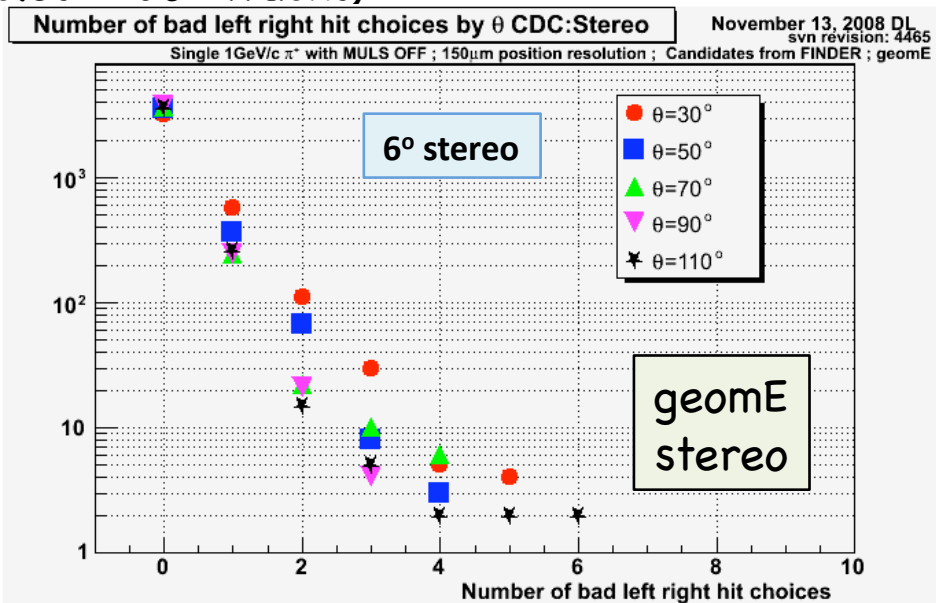
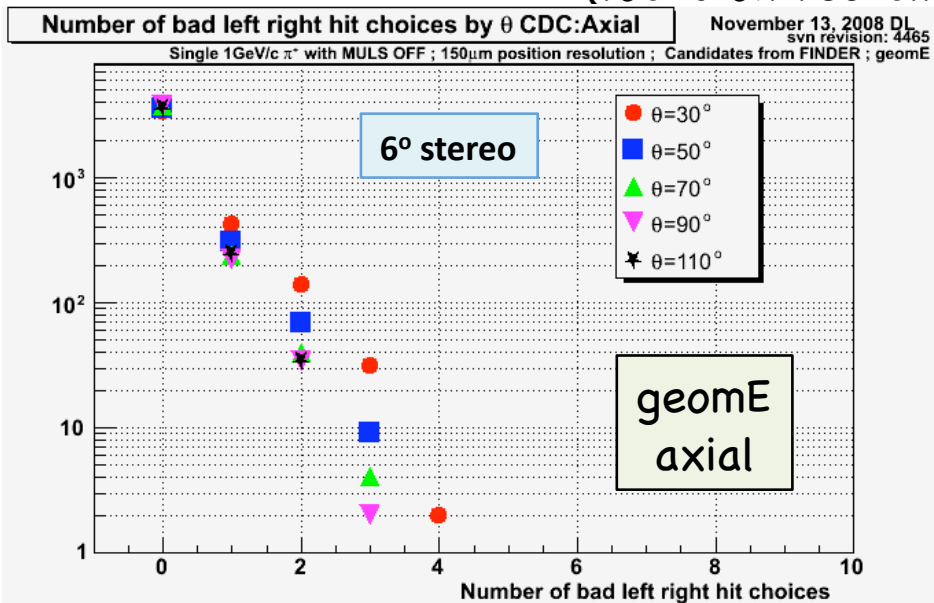
# Stereo to Stereo Transitions

A Previous example of sacrificing stereo to stereo transitions happened with geomA and geomB. Here, there was an improvement in large angles ( $70^\circ \geq$ ) but it actually got worse at  $50^\circ$ .

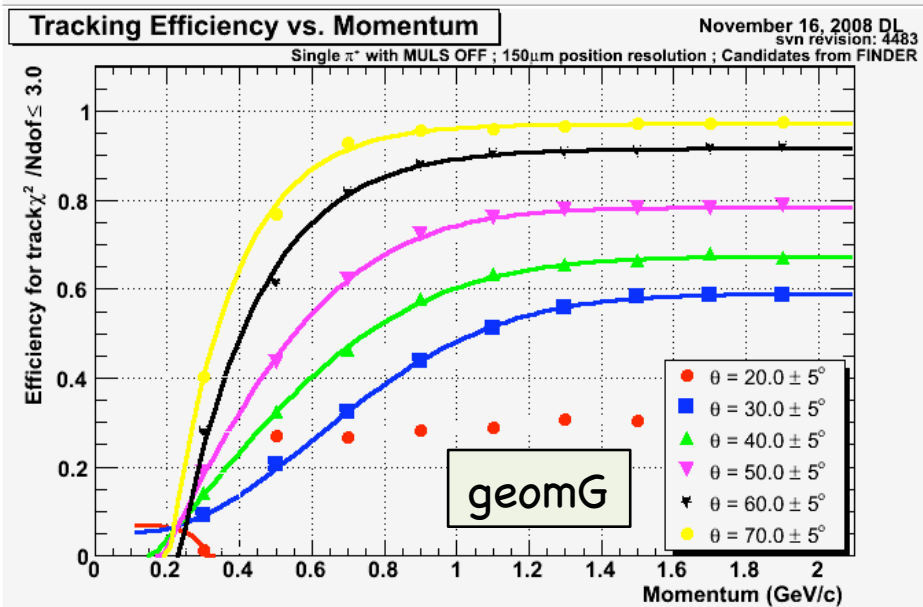
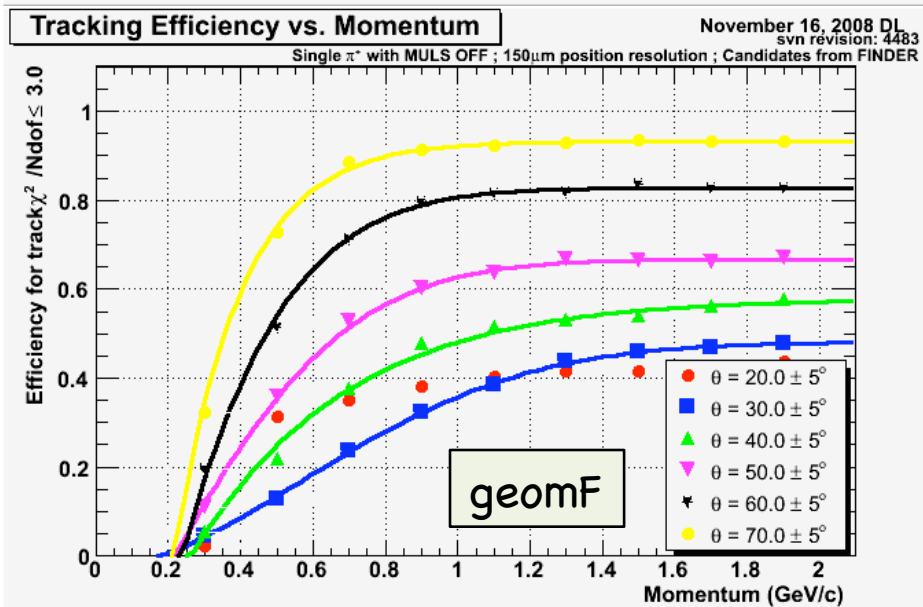
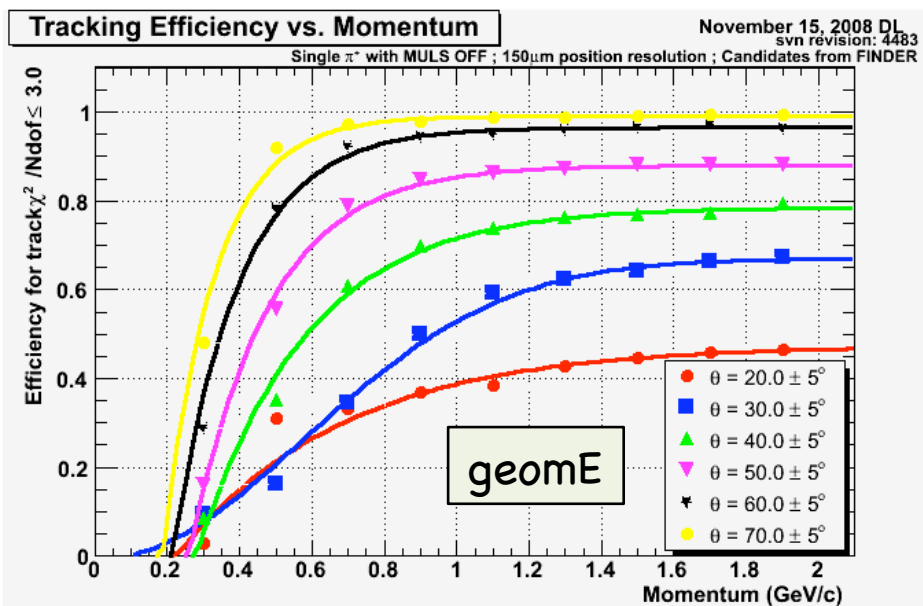
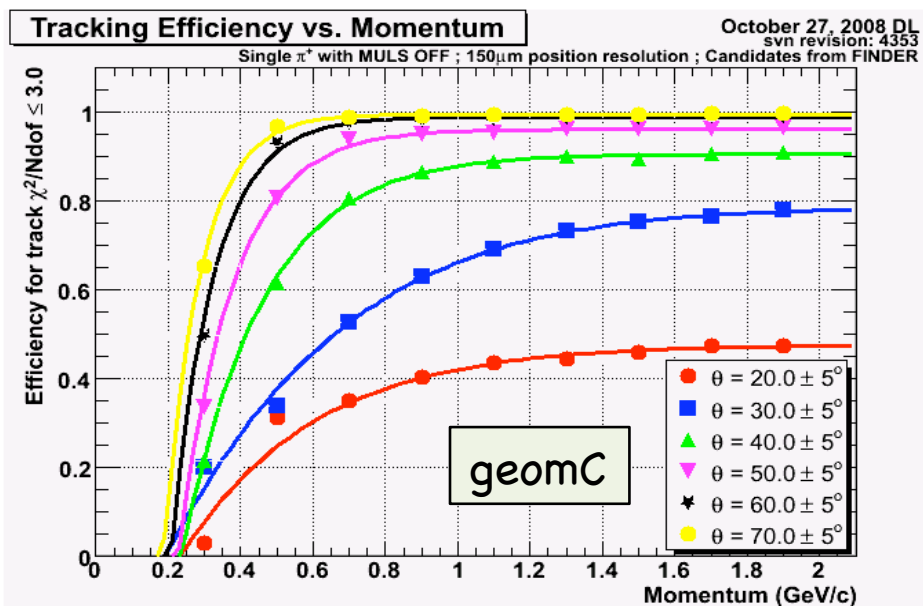


# Bad L-R Choice Rates

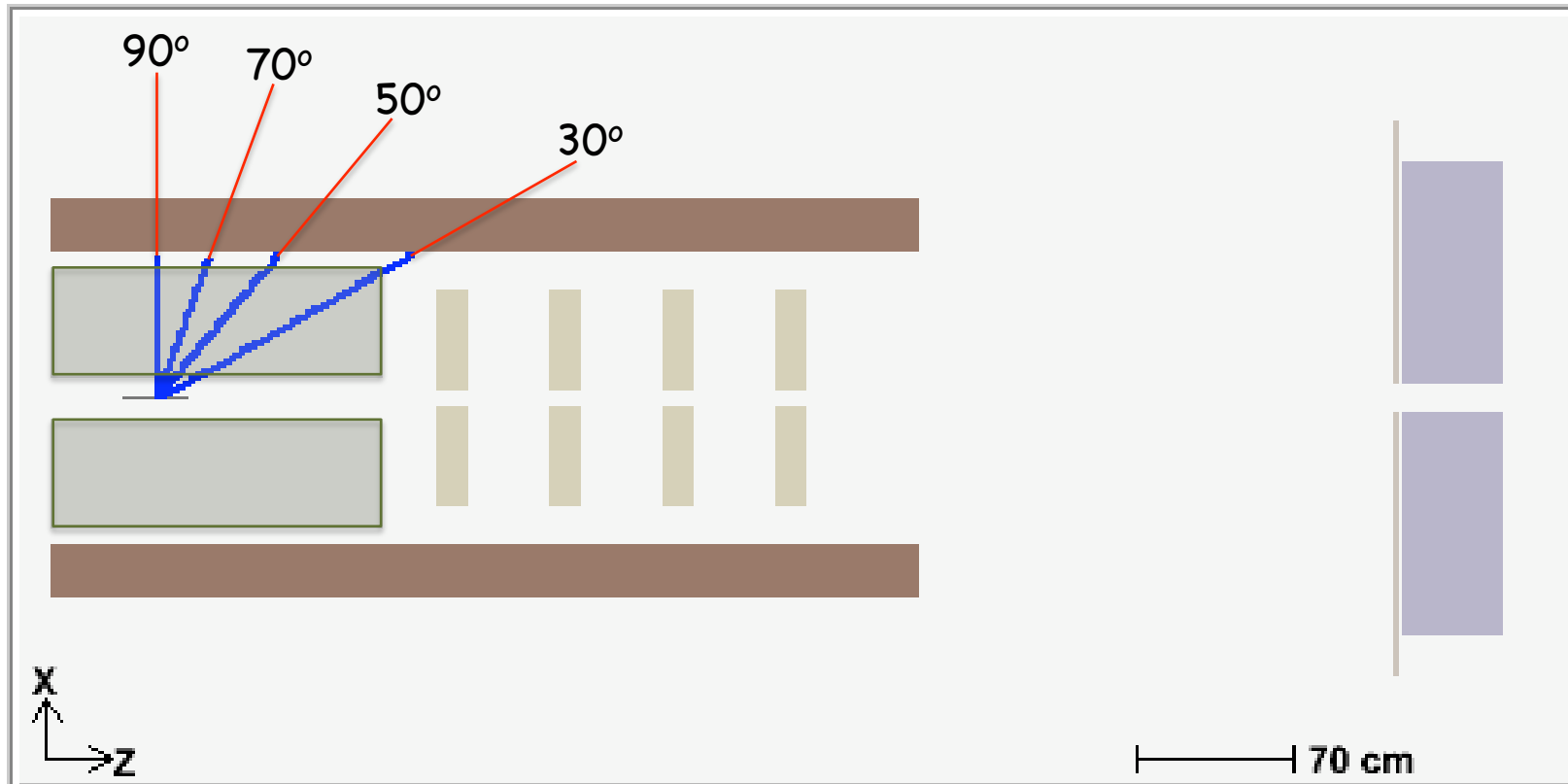
(focus on red circles = 30° tracks)



# Tracking Efficiency vs. momentum and Angle



# 1 GeV/c track locations in CDC





# Conclusions

- Tracking efficiency is better with a 4s-, 4s+ configuration than an 8s configuration
- Tracking efficiency is better with a 6° stereo angle than a 3° stereo angle
- geomC still appears to be our best design. However, there is still an issue with 30° tracks having lower efficiency