Drift Chamber Occupancy Studies Using Bhwide Bhabha Monte Carlo Generator: January 17, 2011

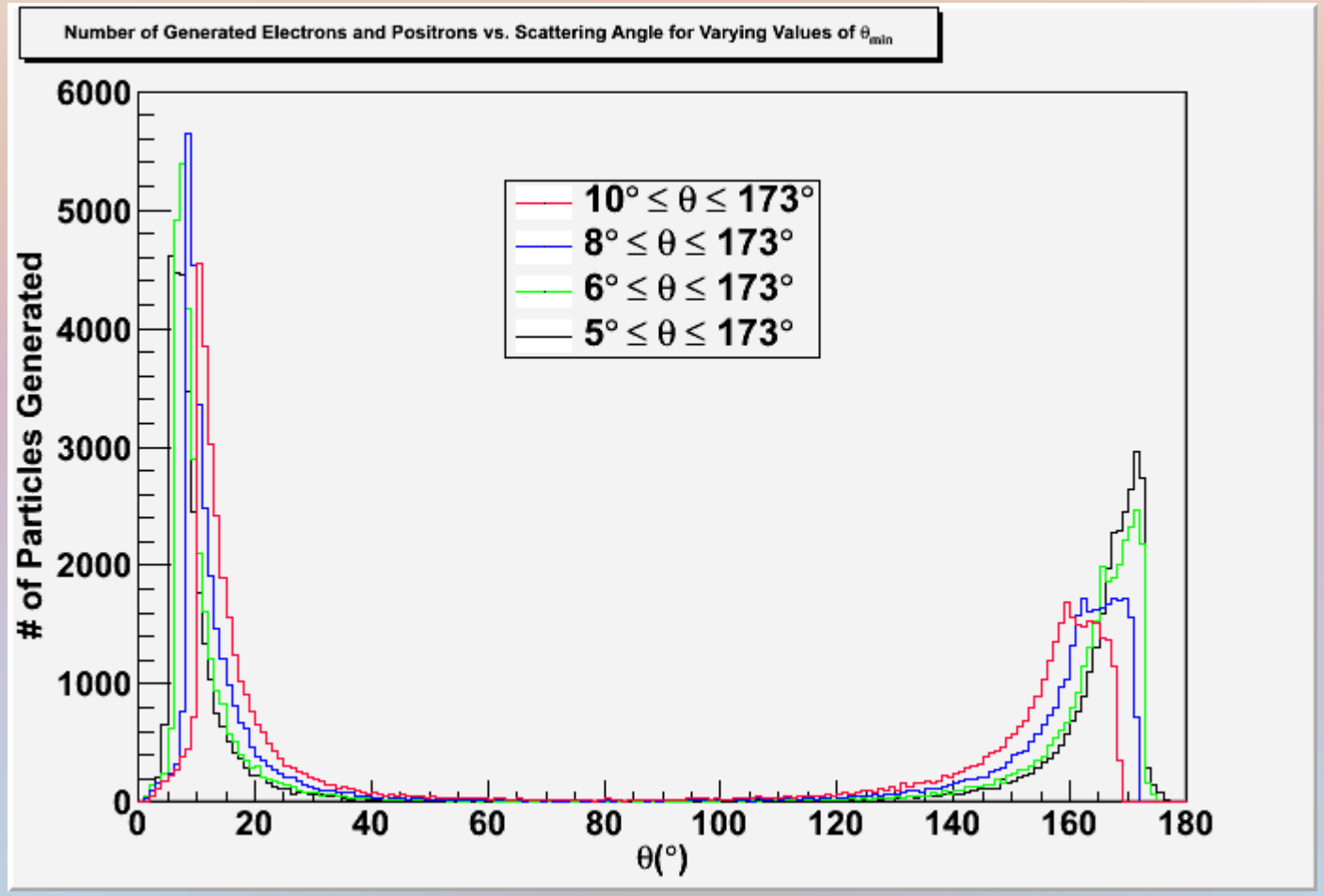
McGill
Darren Swersky,
McGill University

Updates

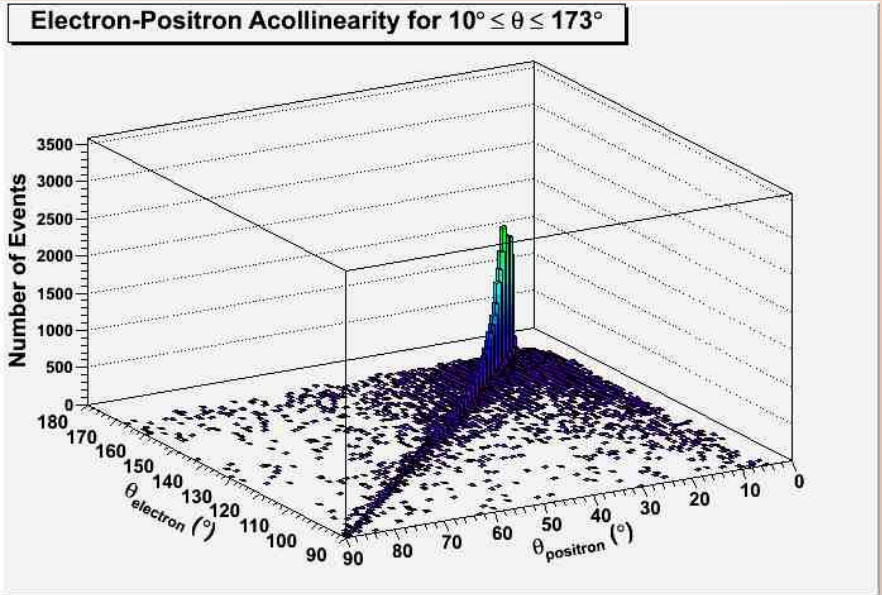
- Latest version of BAD can be found at http://www.physics.mcgill.ca/~swerskyd/swersky_bad_jan17.pdf
- Attempting to optimize Bhabha generator angle cuts, previous scheme was unsatisfactory
- Introduced uniform scaling to facilitate easier comparisons between plots
- Need to update table with wire cell layout info

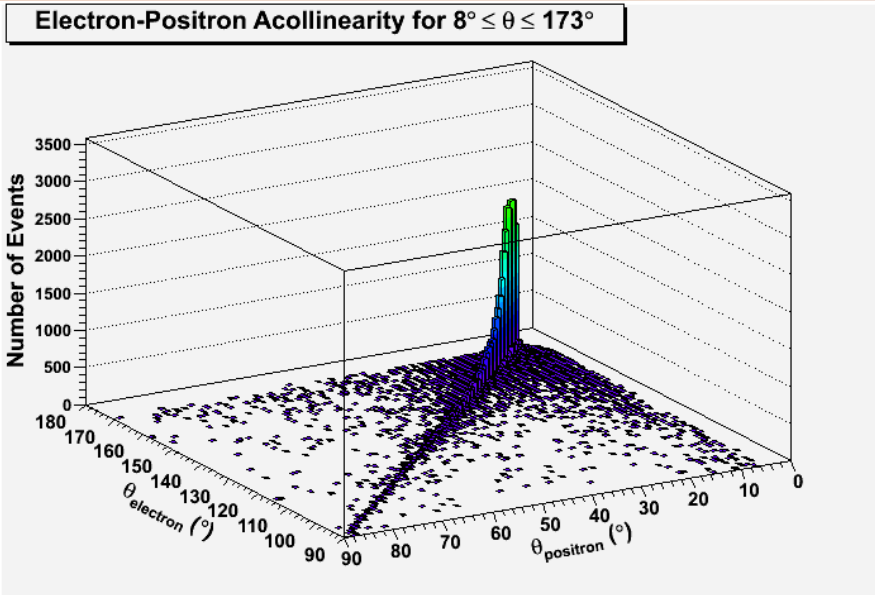
Previous Angle Cut Optimization Attempts

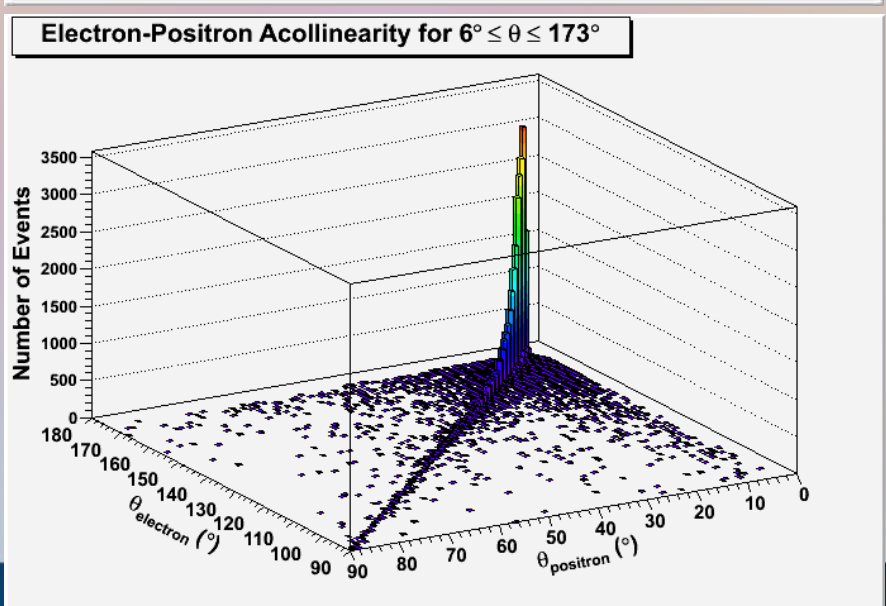
- Want to obtain good accuracy for acollinear Bhabha events involving gamma emission

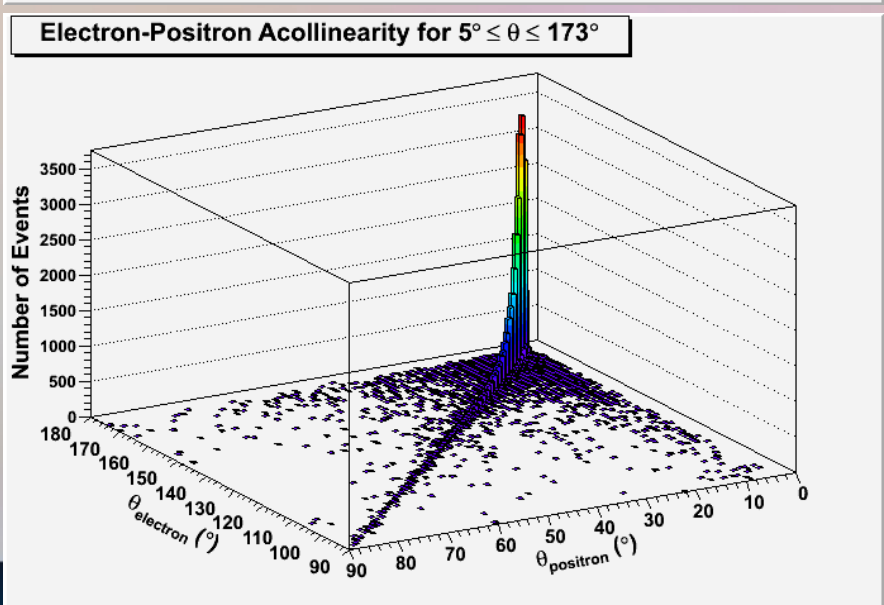


Previous Angle Cut Optimization Attempts





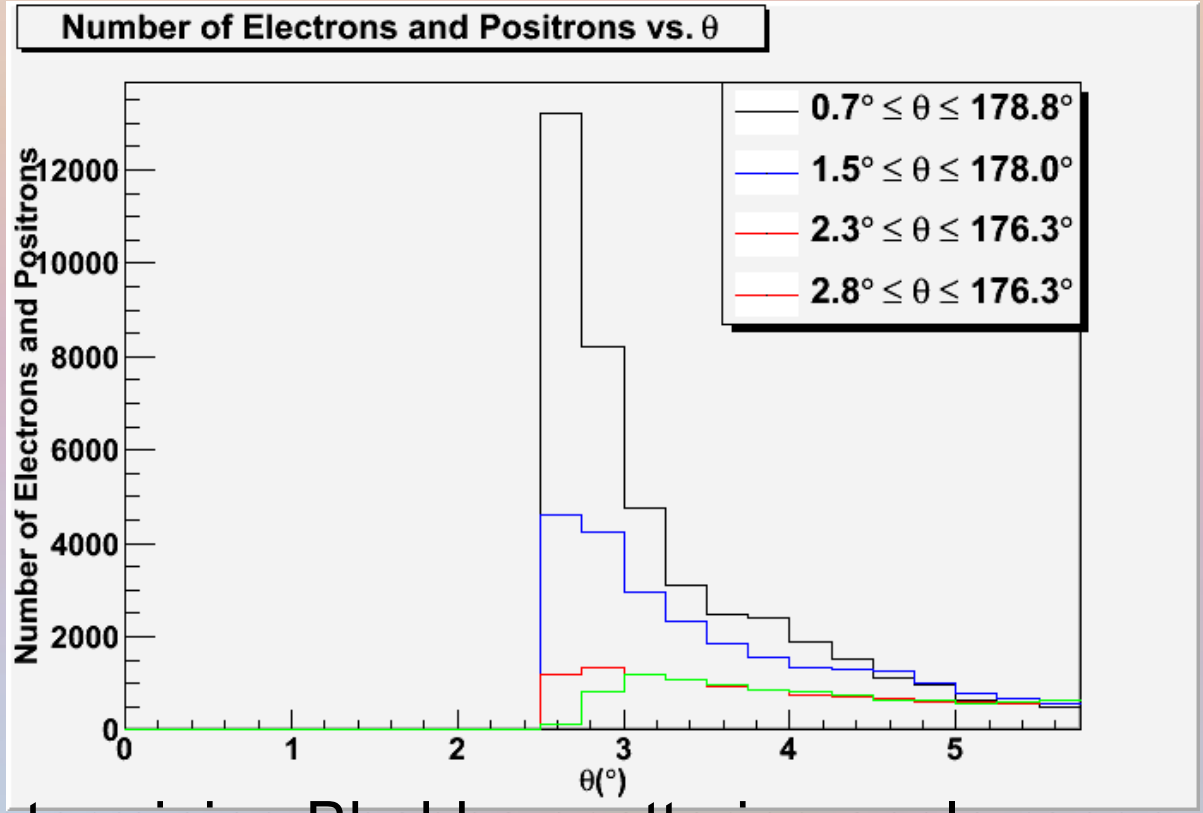




Previous Angle Cut Optimization Attempts

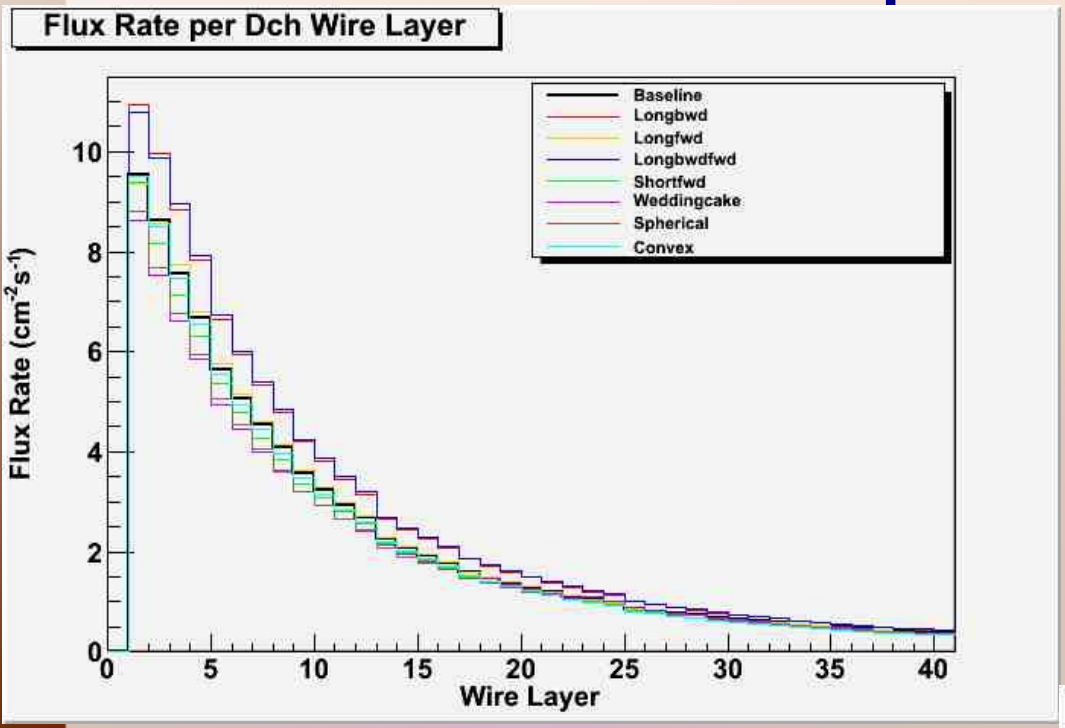
•Problem with previous approach: should have normalized histograms based on range -0.922<=costhCM_e<=0.927

•New difficulties result from making this change:



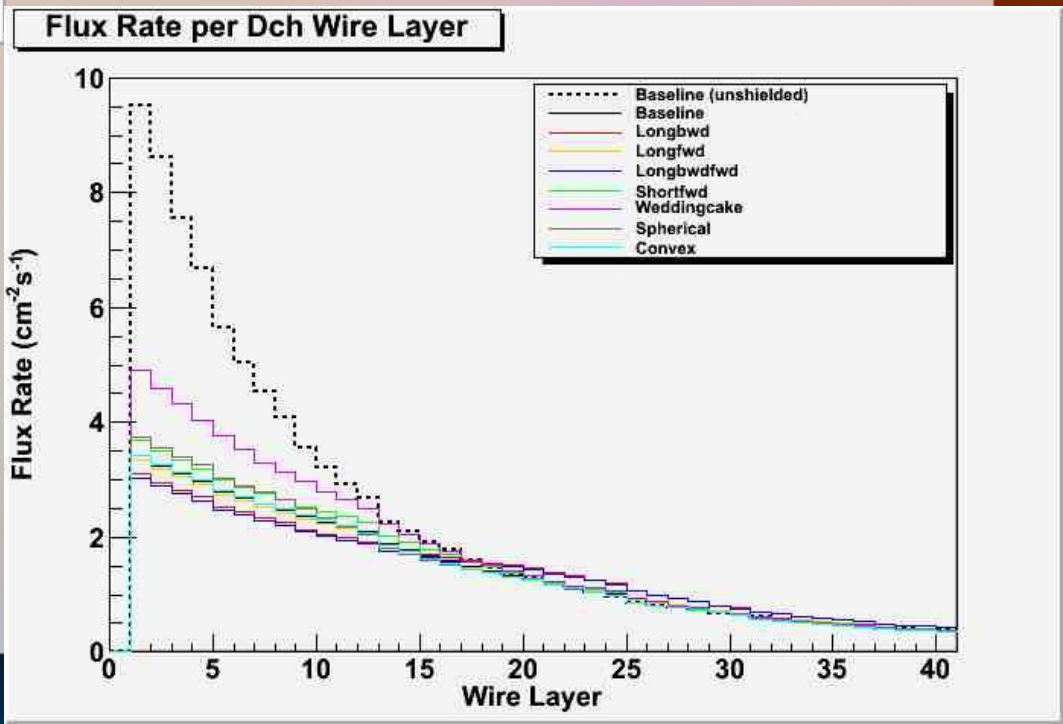
•Solution: determining Bhabha scattering angle range relevant to Dch occupancy (in progress)

Direct Comparisons of Results:



Unshielded

Shielded



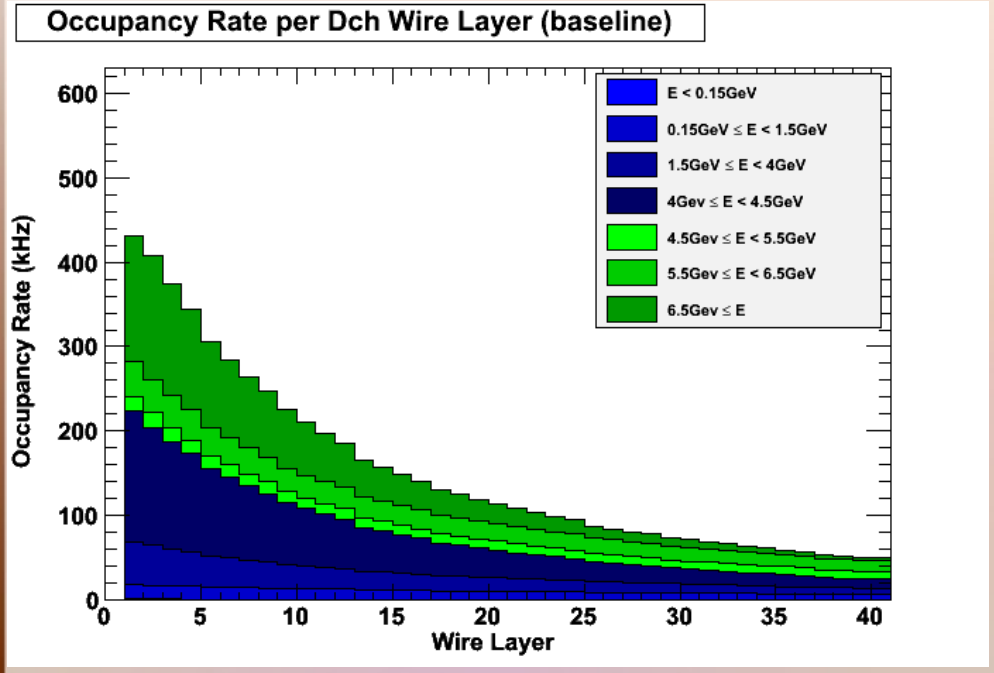
Wire Layer Specs

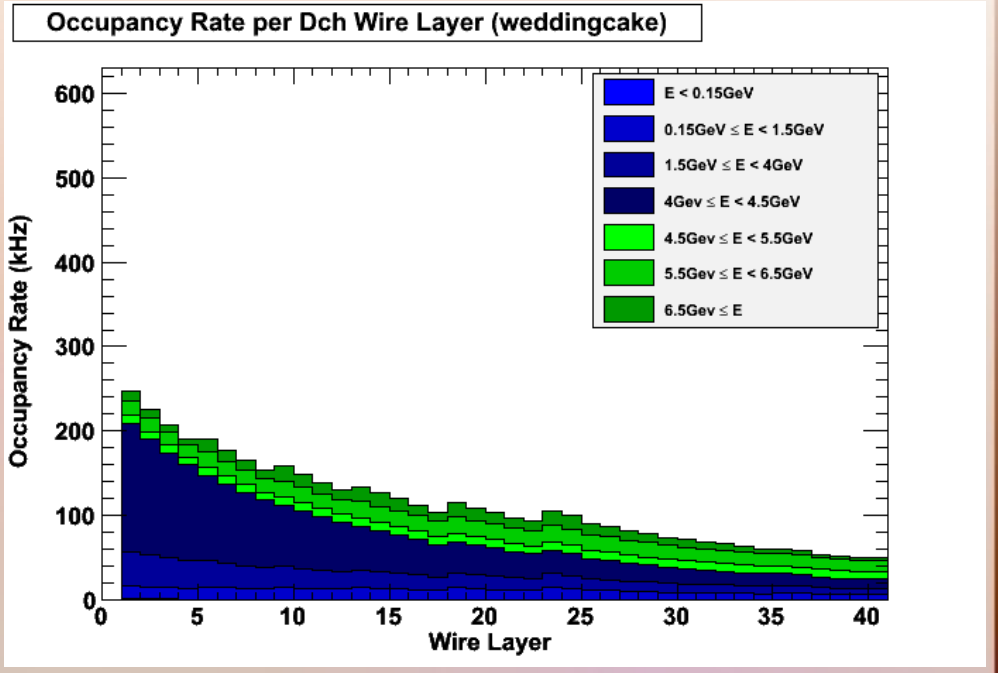
- Needs to be updated to match latest specifications used in FullSim

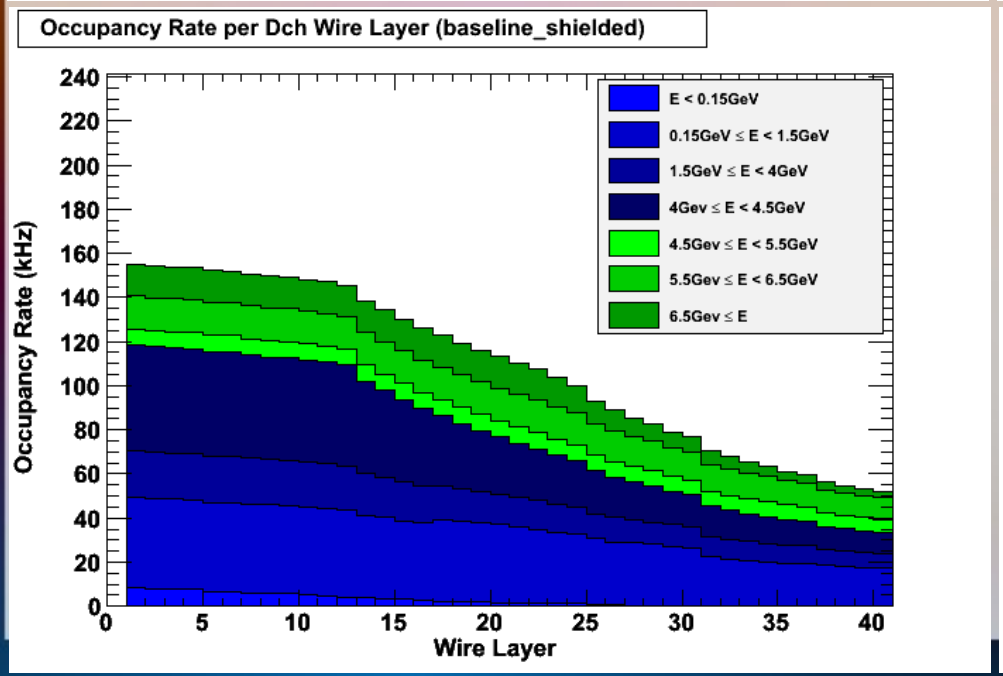
Layer	Radial Position (cm)	# of Wires
1	26.05	160
2	27.24	160
3	28.43	160
4	29.62	192
5	31.25	192
6	32.44	192
7	33.63	192
8	34.82	192
9	36.35	118
10	37.54	118
11	38.73	118
12	39.92	118
13	42.28	134
14	43.47	134
15	44.66	134
16	45.85	150
17	47.67	150
18	48.86	150
19	50.05	166
20	51.24	166

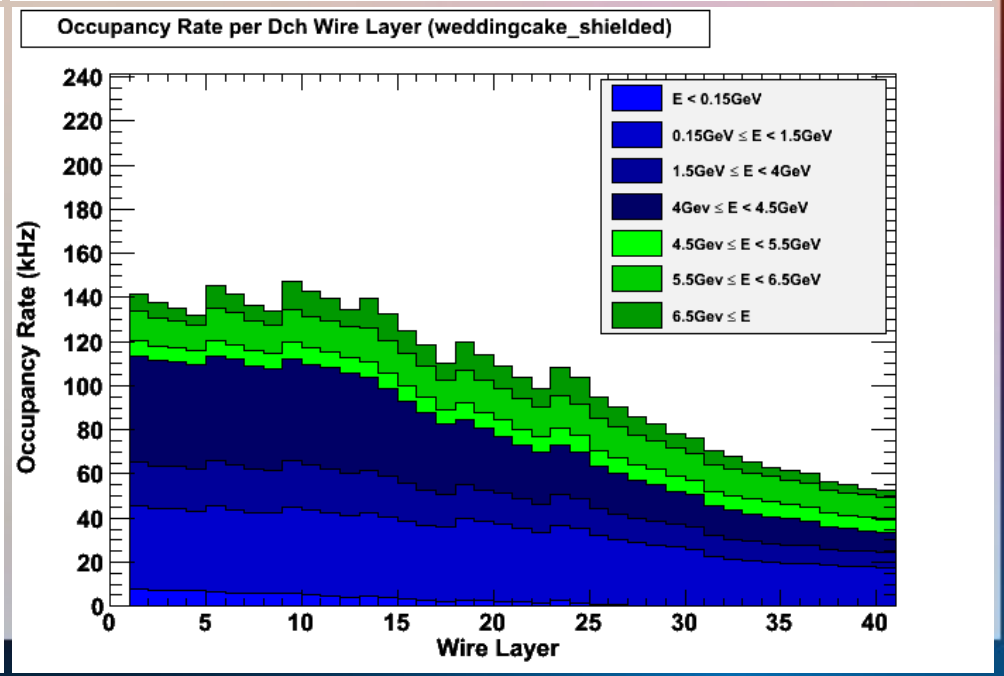
Layer	Radial Position (cm)	# of Wires
21	52.62	166
22	53.81	166
23	55.00	182
24	56.19	182
25	58.55	182
26	59.74	198
27	60.93	198
28	62.12	198
29	63.68	198
30	64.87	214
31	66.06	214
32	67.25	214
33	68.81	214
34	70.00	230
35	71.19	230
36	72.38	230
37	74.73	249
38	75.92	249
39	77.11	249
40	78.30	249

Uniform Scaling of Graphs

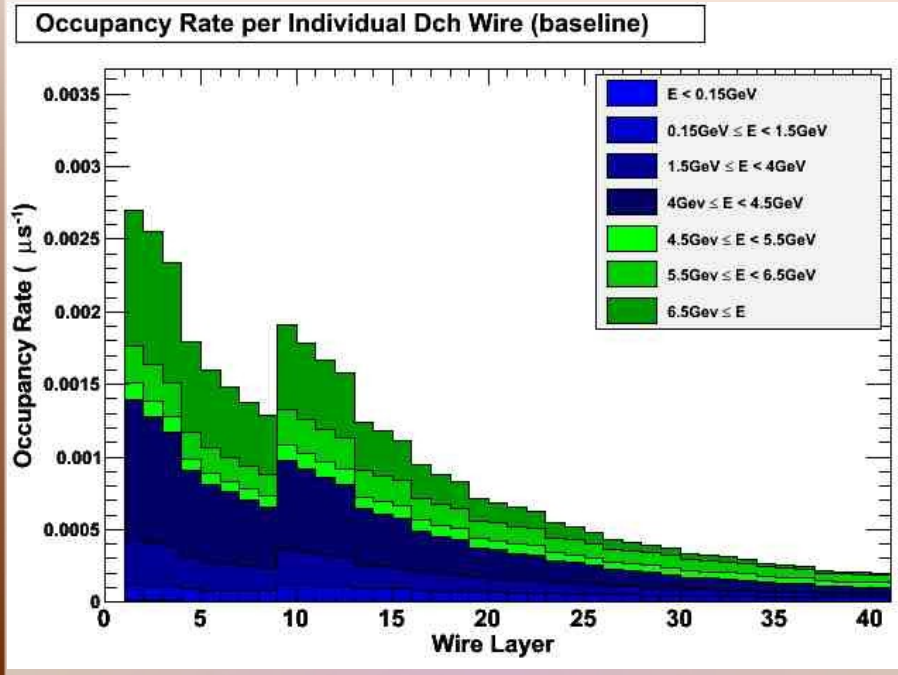


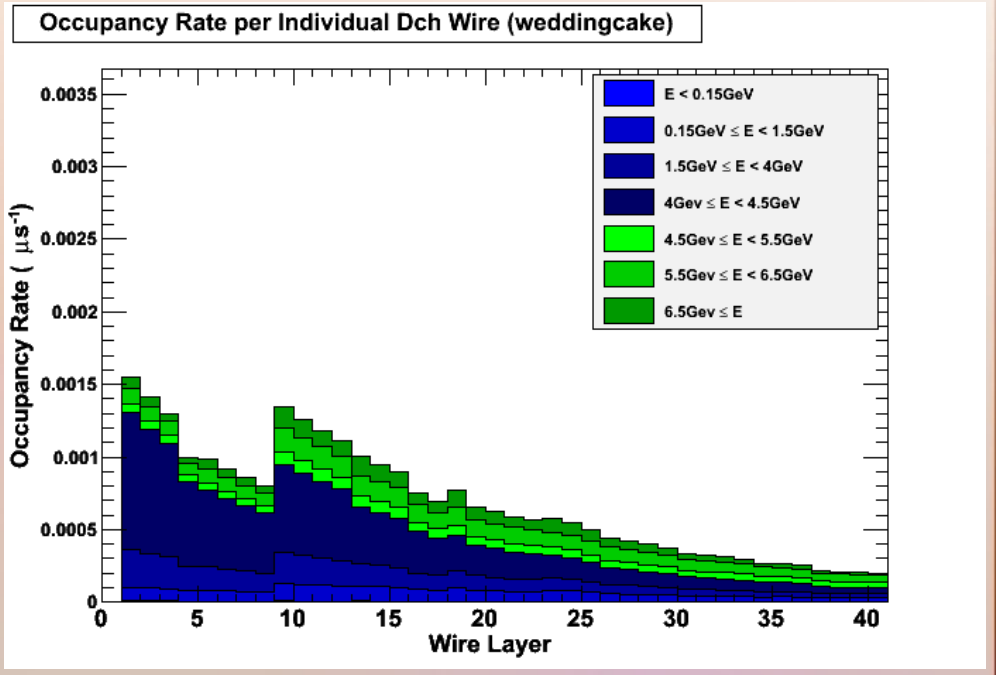


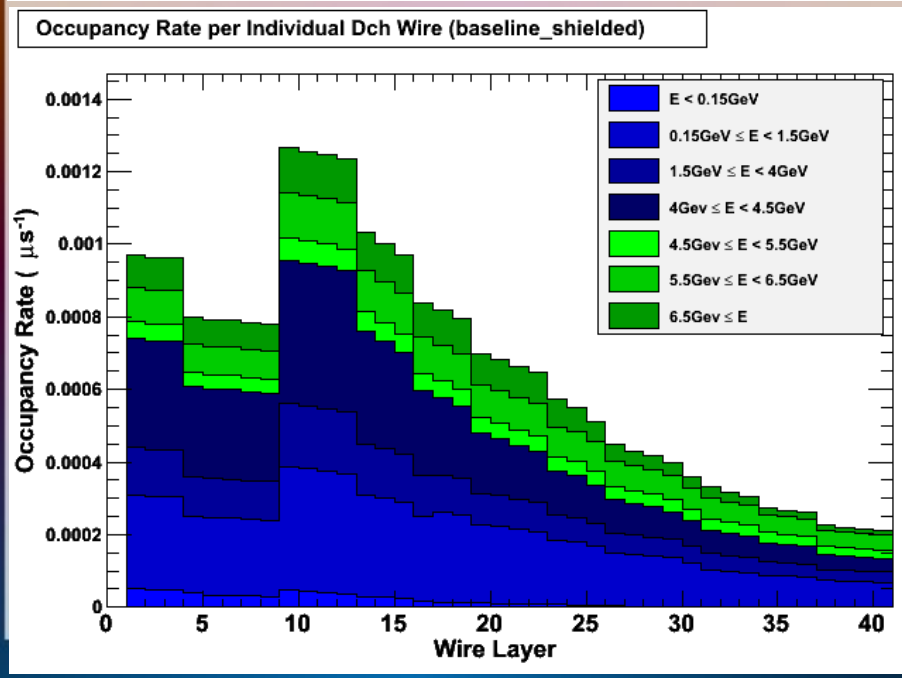


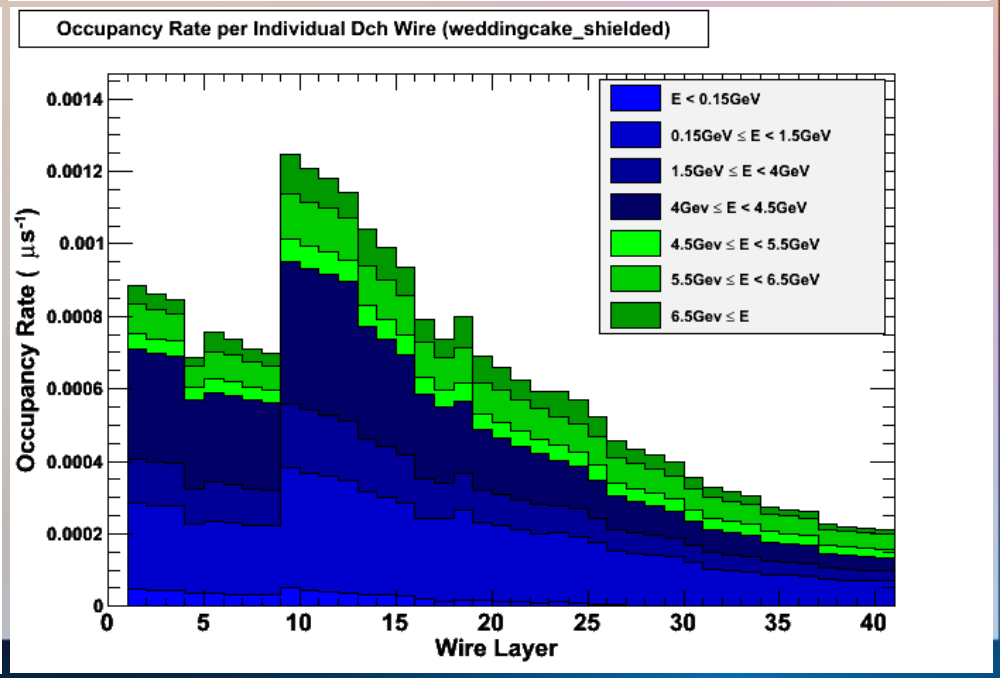


Uniform Scaling of Graphs

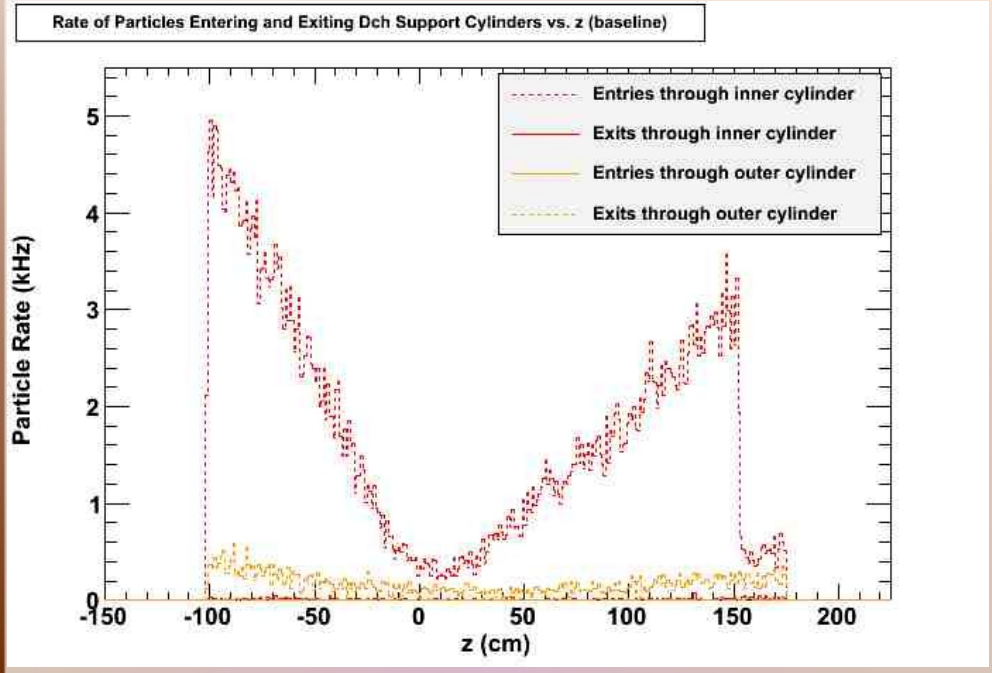


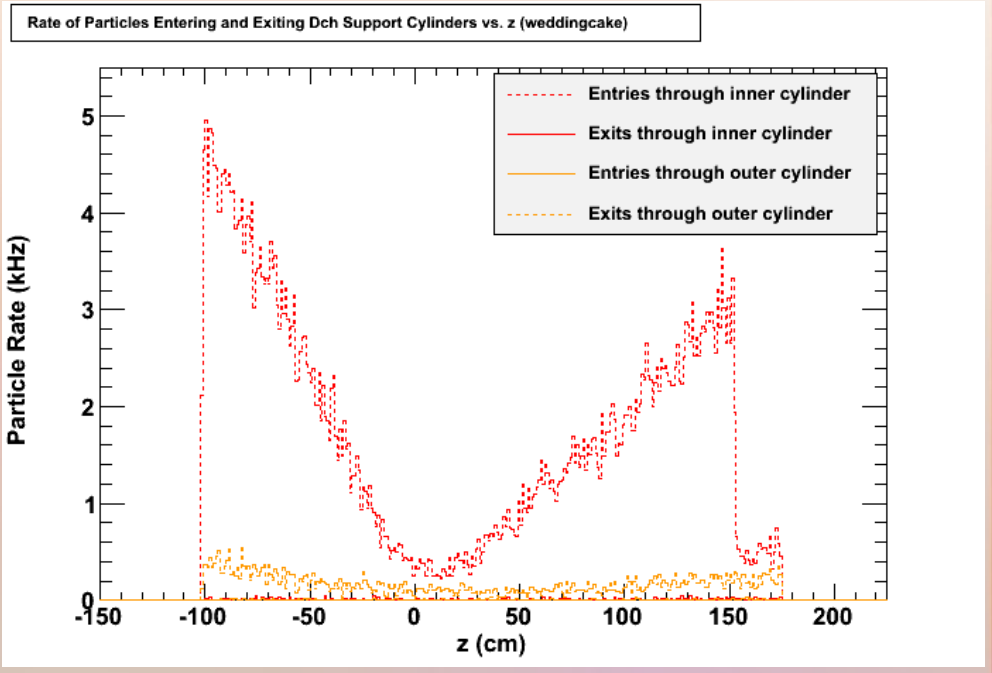


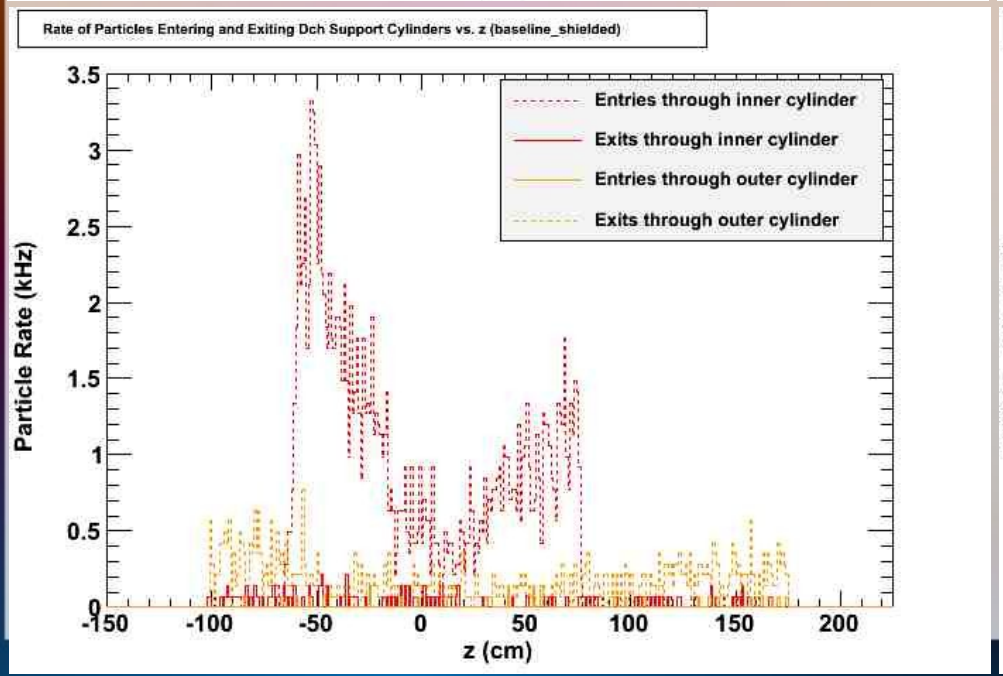


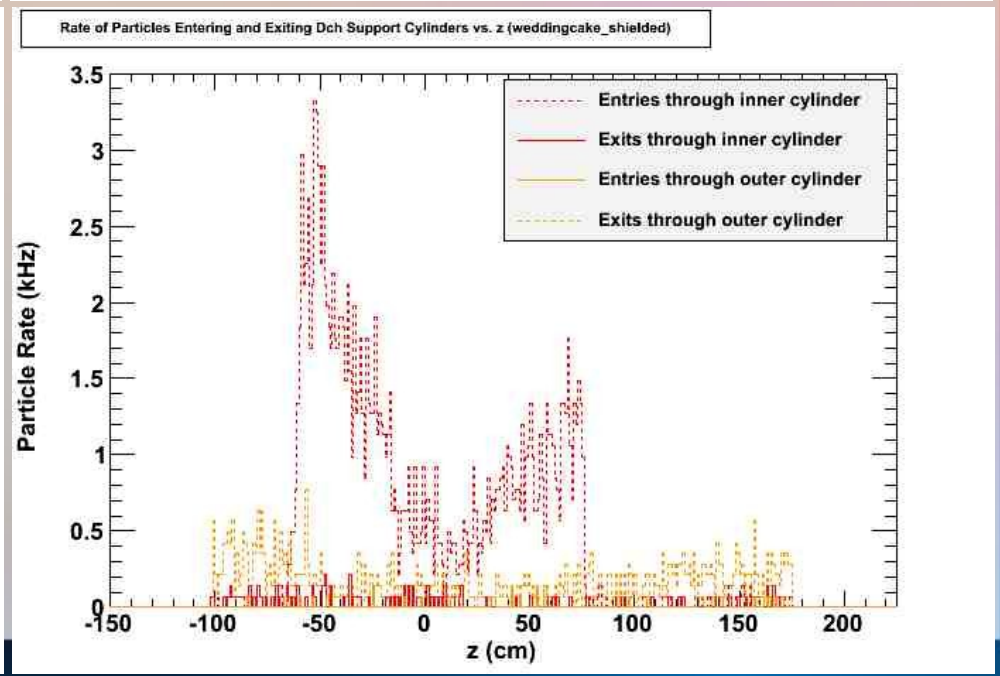


Uniform Scaling of Graphs









Conclusion

- Progress on BAD continues, anticipating first complete draft in ~1 week
- Anticipate conclusion of generator angle optimizations within 2 days
- Nearly all essential data is now included in BAD (graphs for all geometries, also added plots for particles entering and exiting Dch through endplates)
- Will need to rescale plots one last time after completing generator angle optimizations
- Updates to wire cell layouts and specifications will be quick and easy to implement once I have the info