QuickSim tuning

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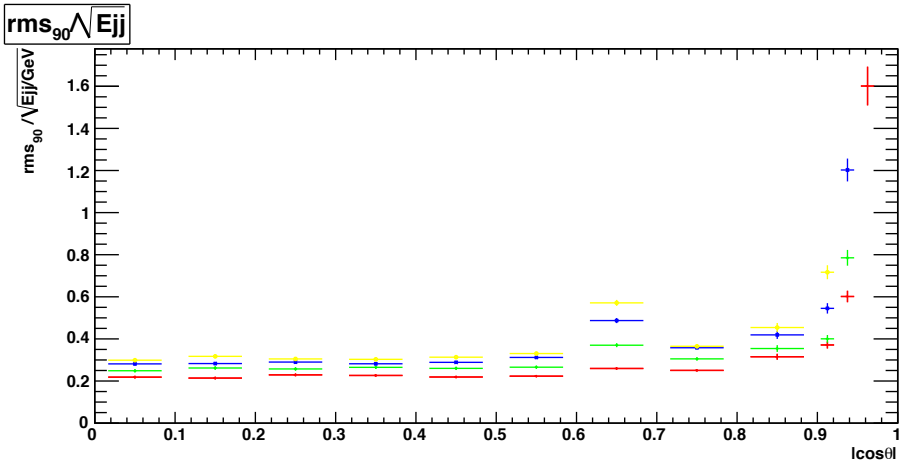
motivation

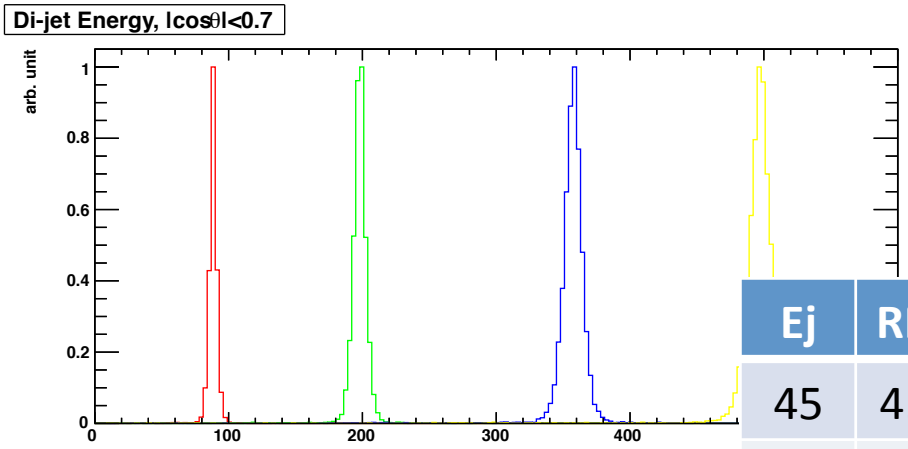
- would like to update QuickSim detector model to match ILD_00 and ILD_01
- current QuickSim tuning was done in 2007
  - optimized for GLD detector geometry with PFA performance at the time
  - conservative jet energy resolution 40%/sqrt(E)
- first, need to verify:
  - jet energy resolution
  - impact parameter resolution
- for different detector configurations:
  - gld_v3.com, gld_v4.com, gld_v4p.com

jet energy resolution

- jet energy resolution is defined in terms of di-jet RMS90 values
- generate Z->qq events using physsim FFStudy generator
  - Ecm = 90, 200, 360, 500 GeV

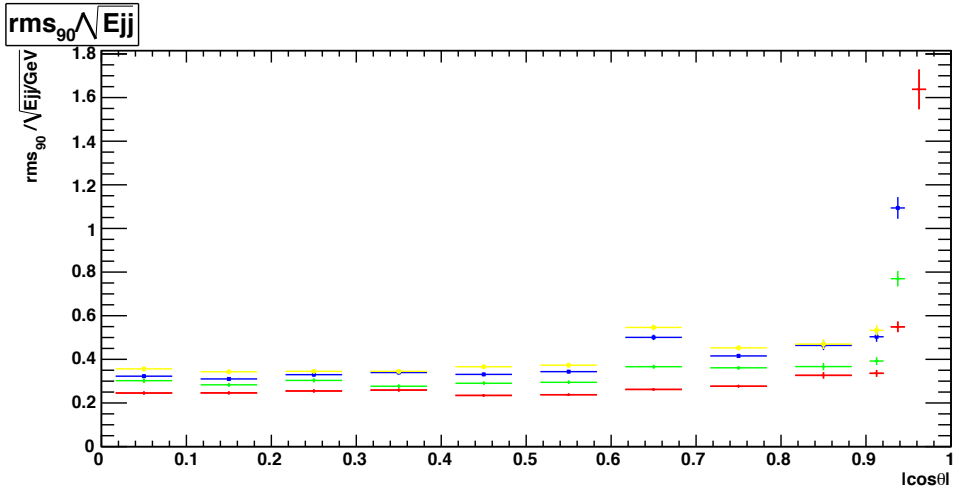
gld_v4p

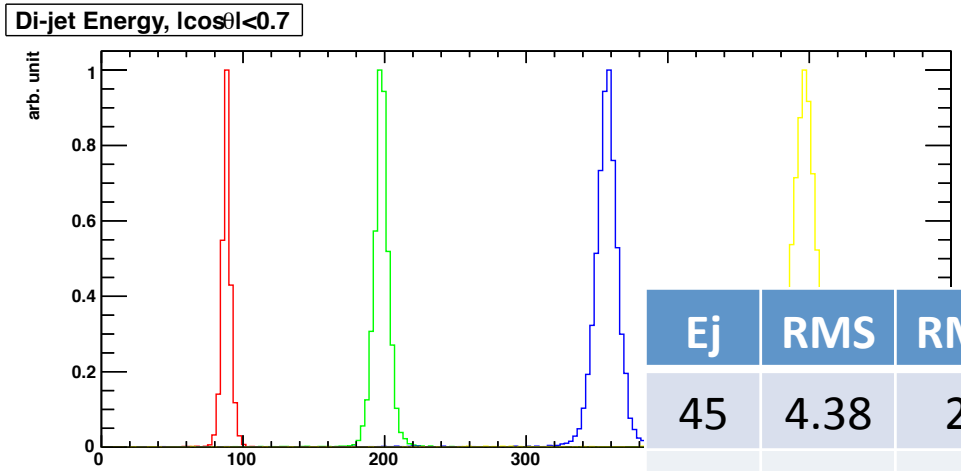




Ej	RMS	RMS90	RMS90/sqrt(Ejj)	JER
45	4.04	2.09	0.22	0.0329 +- 0.0004
100	9.83	3.68	0.26	0.0260 +- 0.0003
180	18.1	5.54	0.29	0.0217 +- 0.0002
250	29.1	6.93	0.31	0.0196 +- 0.0002

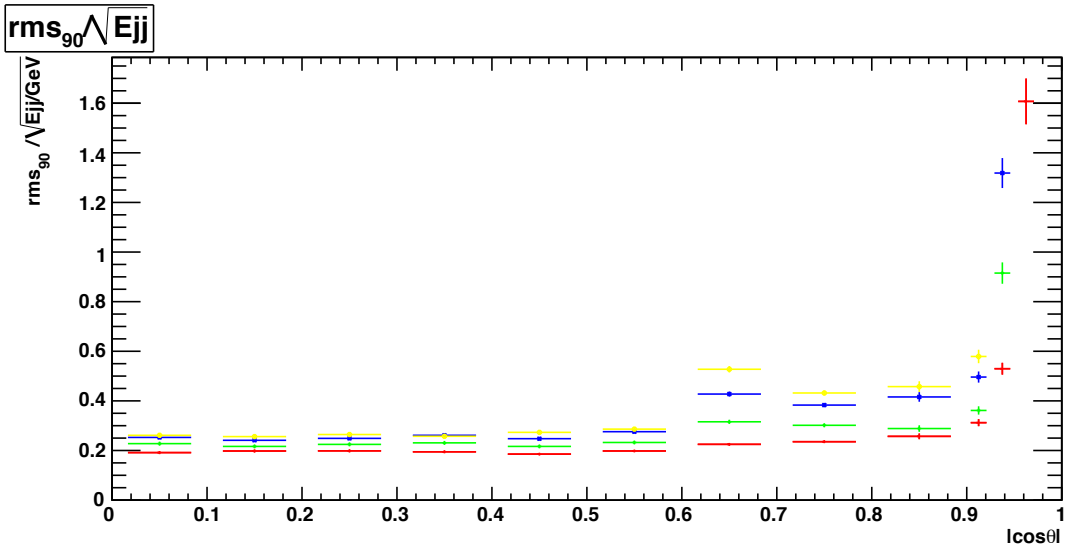
gld_v4

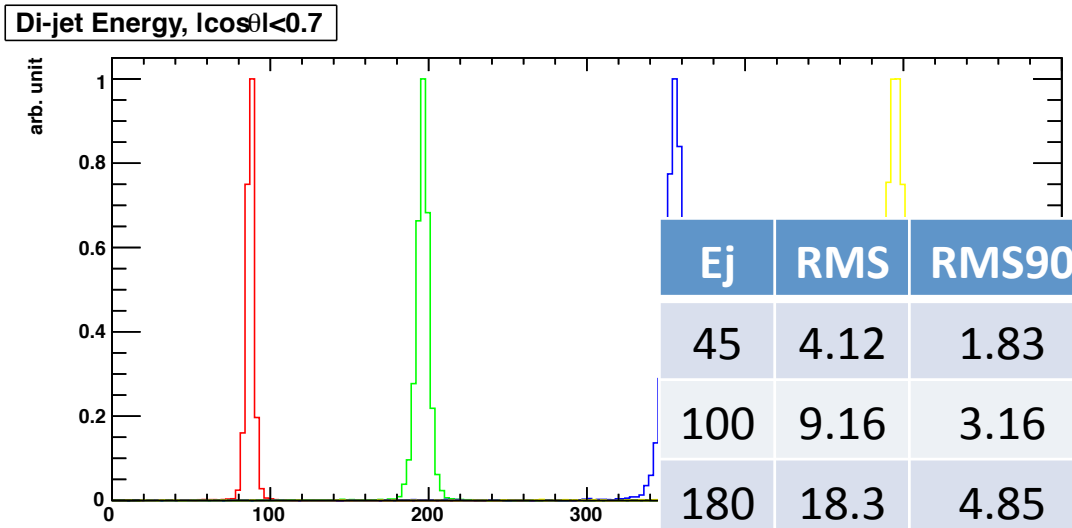




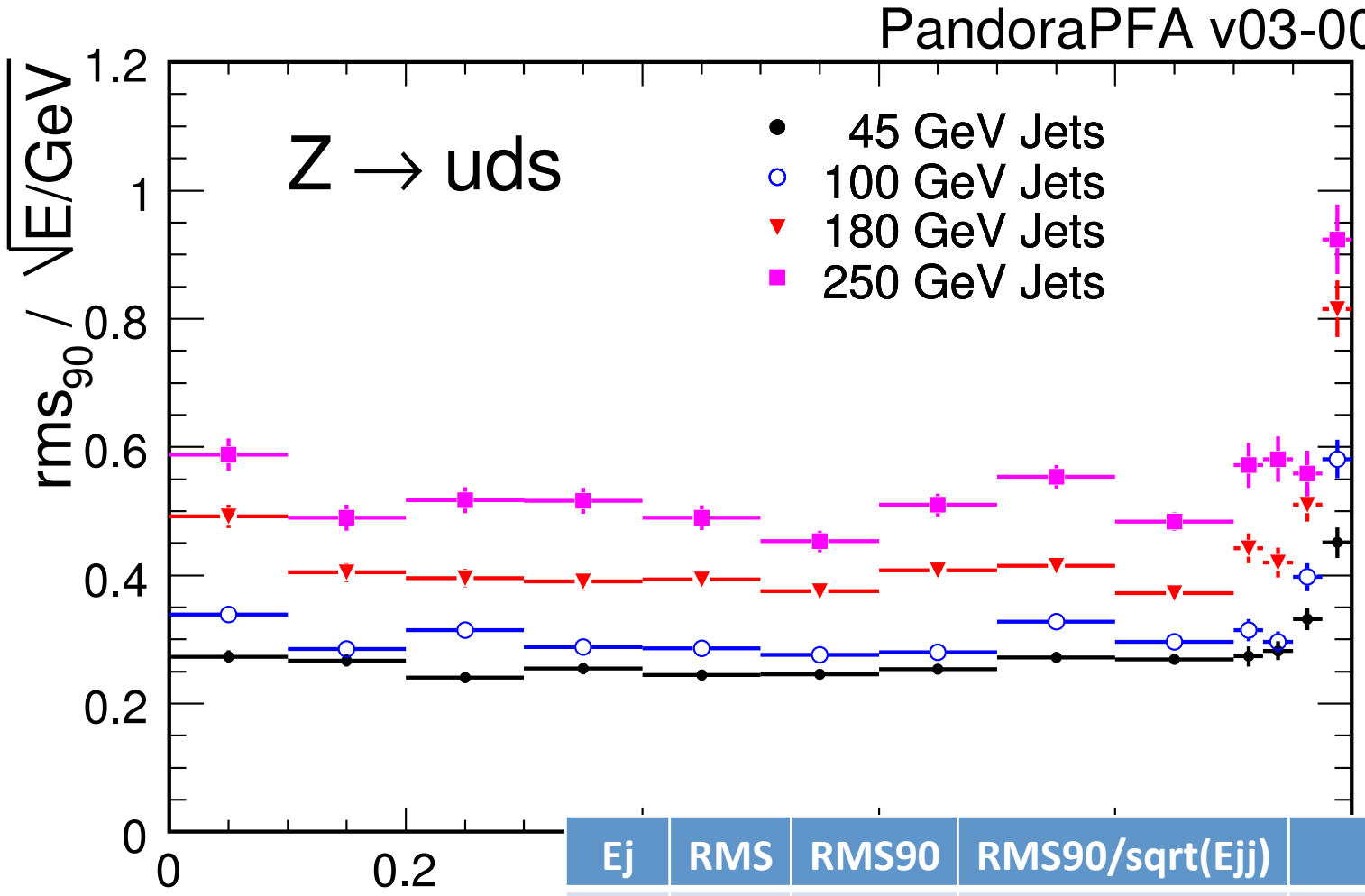
Ej	RMS	RMS90	RMS90/sqrt(Ejj)	JER
45	4.38	2.35	0.25	0.0369 +- 0.0004
100	9.54	4.12	0.29	0.0291 +- 0.0003
180	18.5	6.30	0.33	0.0248 +- 0.0003
250	27.4	7.90	0.35	0.0224 +- 0.0002

gld_v3

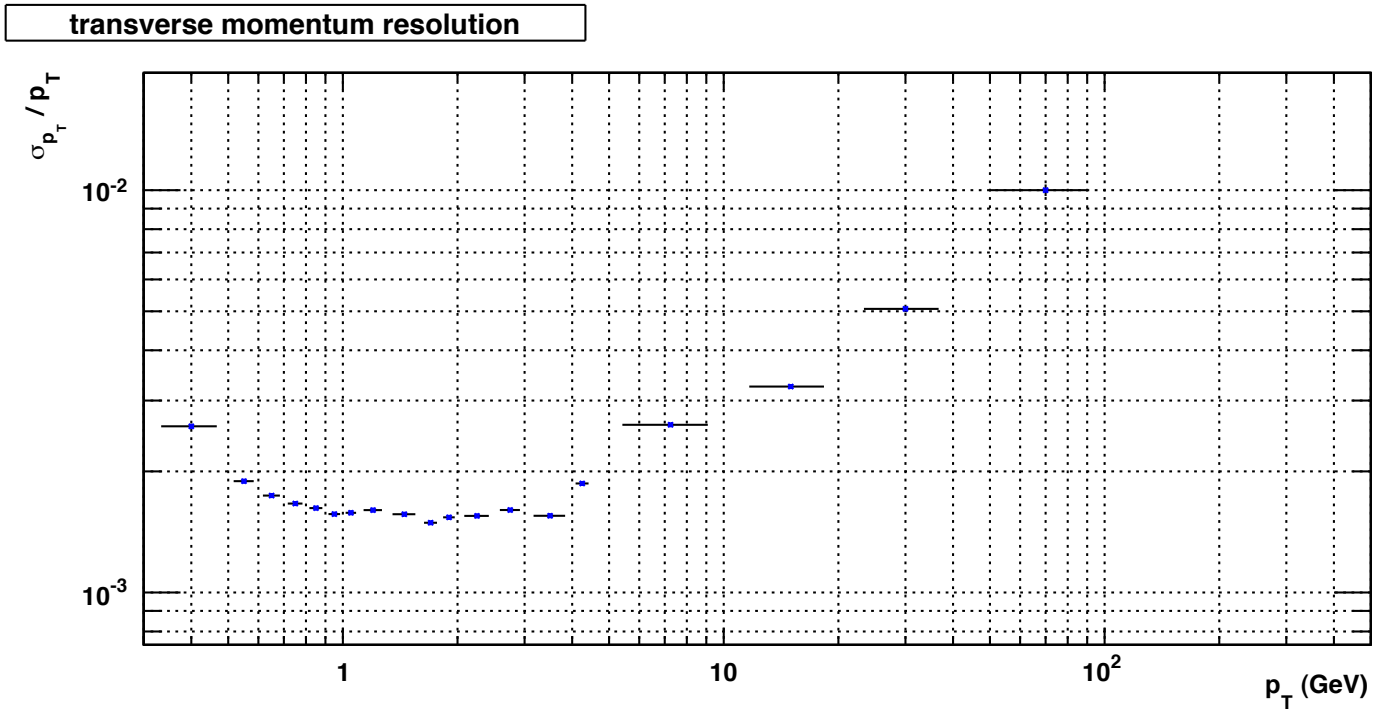


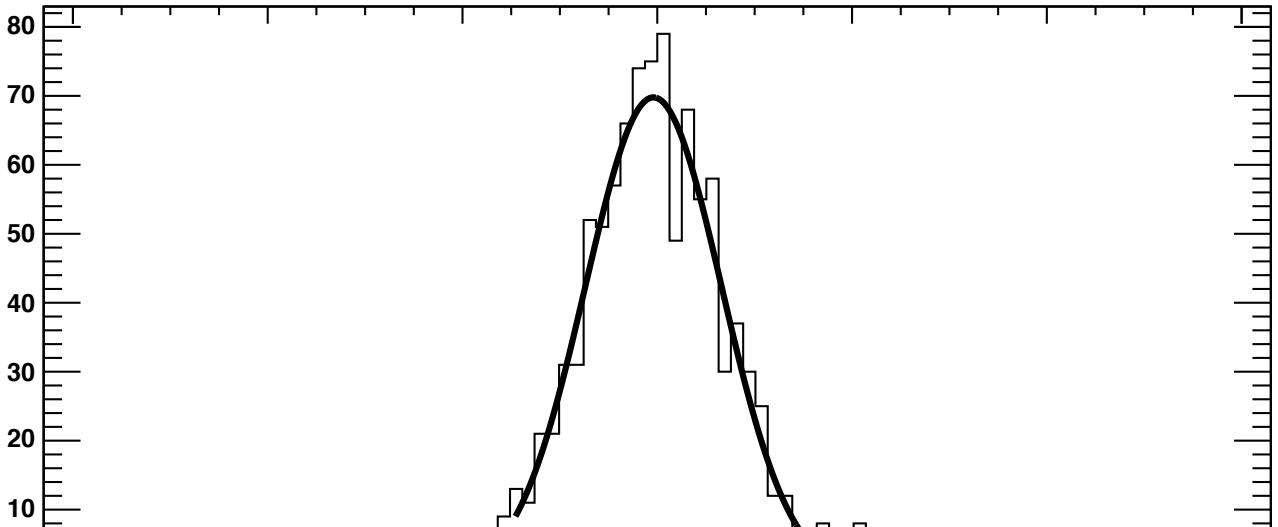


Ej	RMS	RMS90	RMS90/sqrt(Ejj)	JER
45	4.12	1.83	0.19	0.0288 +- 0.0003
100	9.16	3.16	0.22	0.0223 +- 0.0002
180	18.3	4.85	0.26	0.0191 +- 0.0002
250	25.0	5.95	0.27	0.0168 +- 0.0002



Ej	RMS	RMS90	RMS90/sqrt(Ejj)	JER
45	3.3	2.4	0.25	0.0371 +- 0.0005
100	5.8	4.1	0.295	0.0295 +- 0.0004
180	11.2	7.5	0.401	0.0299 +- 0.0004
250	16.9	11.1	0.501	0.0317 +- 0.0005


transverse momentum resolution
σ_{p_T} / p_T
10^{-2}
10^{-3}
1
10
10^2
p_T (GeV)


80
70
60
50
40
30
20
10