L1 Calorimeter Weights

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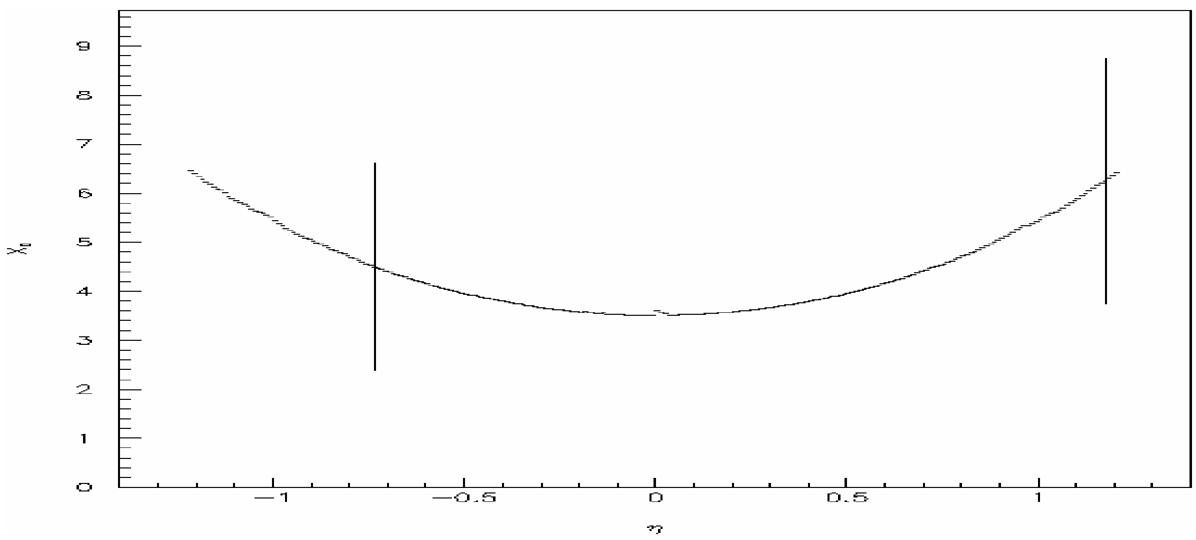
- Sampling weights (EM) for the L1 calorimeter trigger
- Sampling weights (EM) used for the trigger simulation
- Comparison

L1 Weights

- sampling weights for which the initial values of summing resistor for L1 calorimeter will be based on
- method: optimizing resolution of 50 GeV electrons/positrons (–electrons)
- samples: 50 GeV electrons generated in p05.00.04 plate geometry, with no minbias or zero–suppression
- only calorimeter energy is used
- 1 per EM layer for each tower/ieta (detector–η–dependent)
- each MC electrons are projected to EM3 to determine the tower/ieta that it hits. The 4 EM weights of each ieta are determined by electrons of the same ieta.
- call them set A

CC Weights

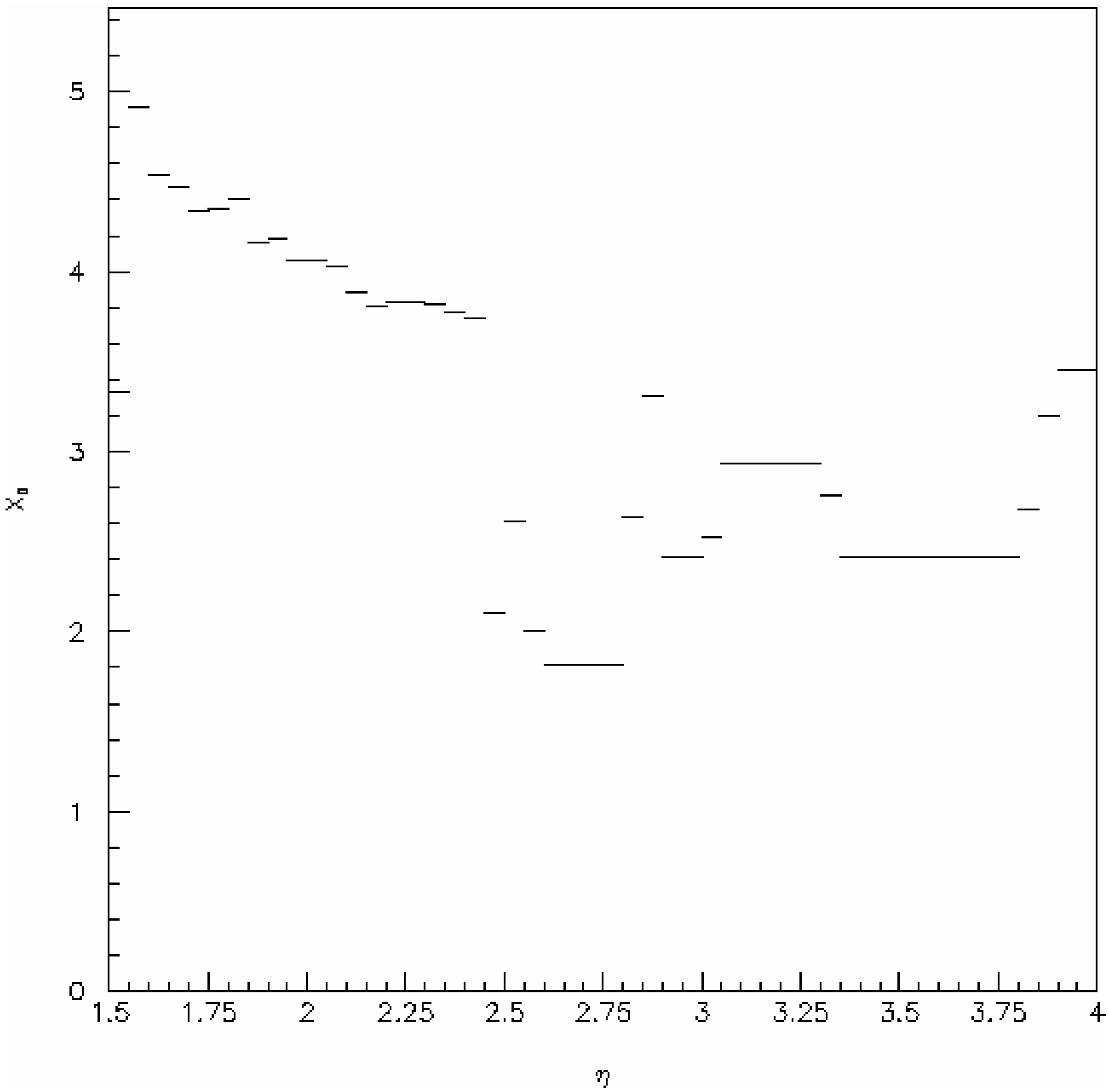
IETA	EM1	EM2	EM3	EM4
1	24.0405	13.5962	12.9449	14.9818
2	26.2442	11.647	13.2856	14.6743
3	25.3655	13.0426	12.9443	14.902
4	27.4191	11.2217	13.3628	14.2934
5	27.3942	11.9856	13.1091	14.5278
6	28.8219	11.1042	13.1467	14.6521
7	30.3707	9.92599	13.4157	14.0632
8	31.6668	9.20101	13.3432	14.4403
9	32.7512	8.51071	13.4916	14.2188
10	34.6833	6.93073	13.671	14.4436
11	37.4252	4.33905	14.306	13.3911
12	32.1393	15.4939	12.2888	—



EC Weights

IETA	EM1	EM2	EM3	EM4
14	—	—	14.3024	98.6688
			23.3966	53.6919
15	2.21235	22.1116	25.7777	11.2839
	—	22.5544	25.723	11.4304
16	49.7951	13.29	17.0928	20.7022
17	38.3744	15.7605	16.9182	20.6416
18	32.2962	17.3253	17.3016	20.365
19	28.6064	19.0855	17.0947	20.9448
20	29.4603	18.0401	17.1789	21.5328
21	29.1149	17.9388	17.4543	20.0313
22	27.993	18.4135	17.2617	20.7751
23	29.2989	17.0822	17.5515	20.5204
24	28.0875	18.2953	17.1576	20.8979
25	26.2133	20.0152	16.6787	21.2229
26	30.3427	16.416	17.2918	20.2359
27	23.9942	16.9529	17.5645	19.8879
28	12.9963	19.2226	17.4655	20.1494
29	27.8245	15.3719	17.687	20.0267
30	19.7794	20.4675	17.0047	20.4922
31	19.6851	17.5238	17.8443	19.6385
32	21.4431	17.4376	17.9567	19.3553
33	21.4614	17.4515	17.9067	19.7871
34	16.2862	18.9318	17.7936	20.1845
35	80.1542	0.4787	17.8244	37.4324

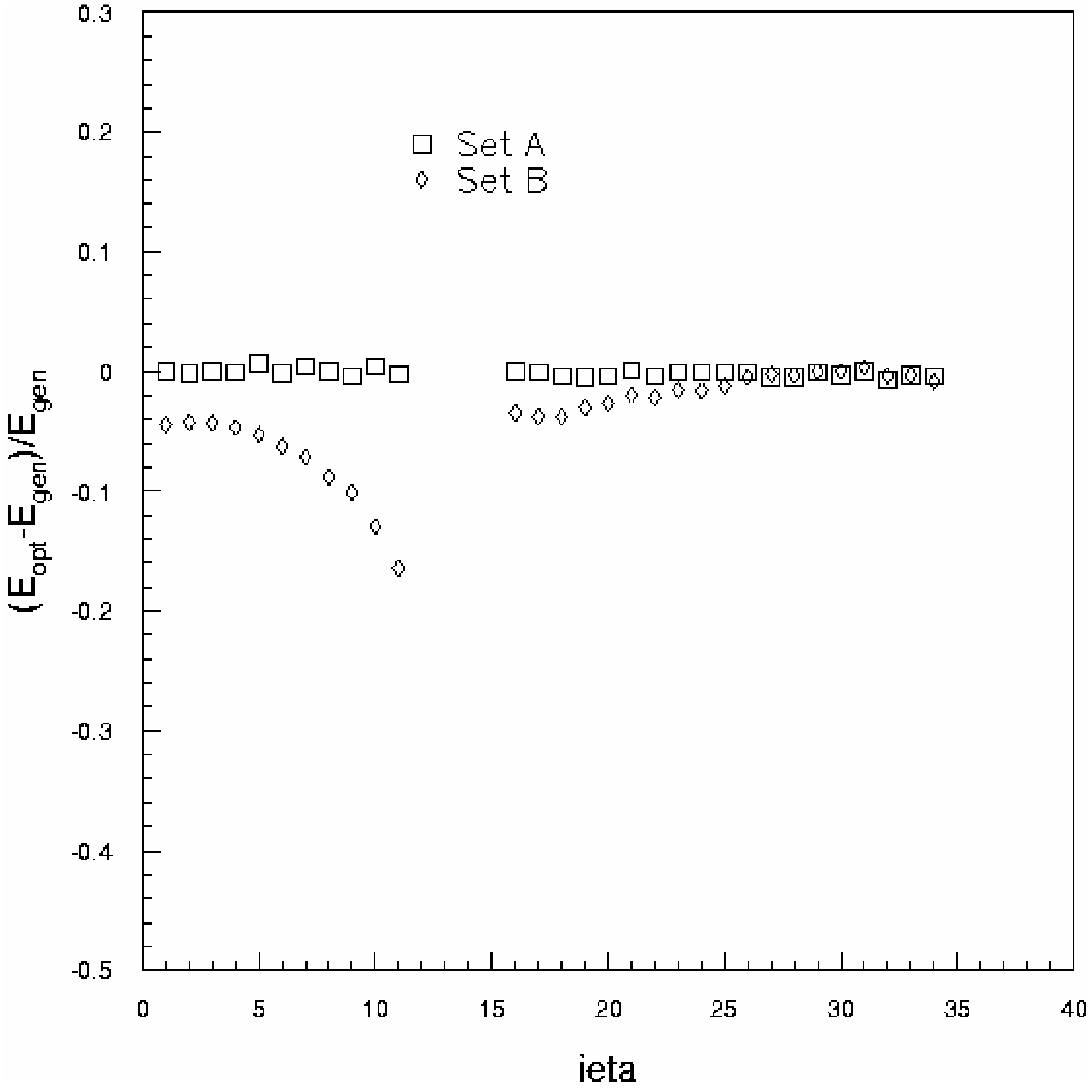
Radiation Lengths before active Calorimeter



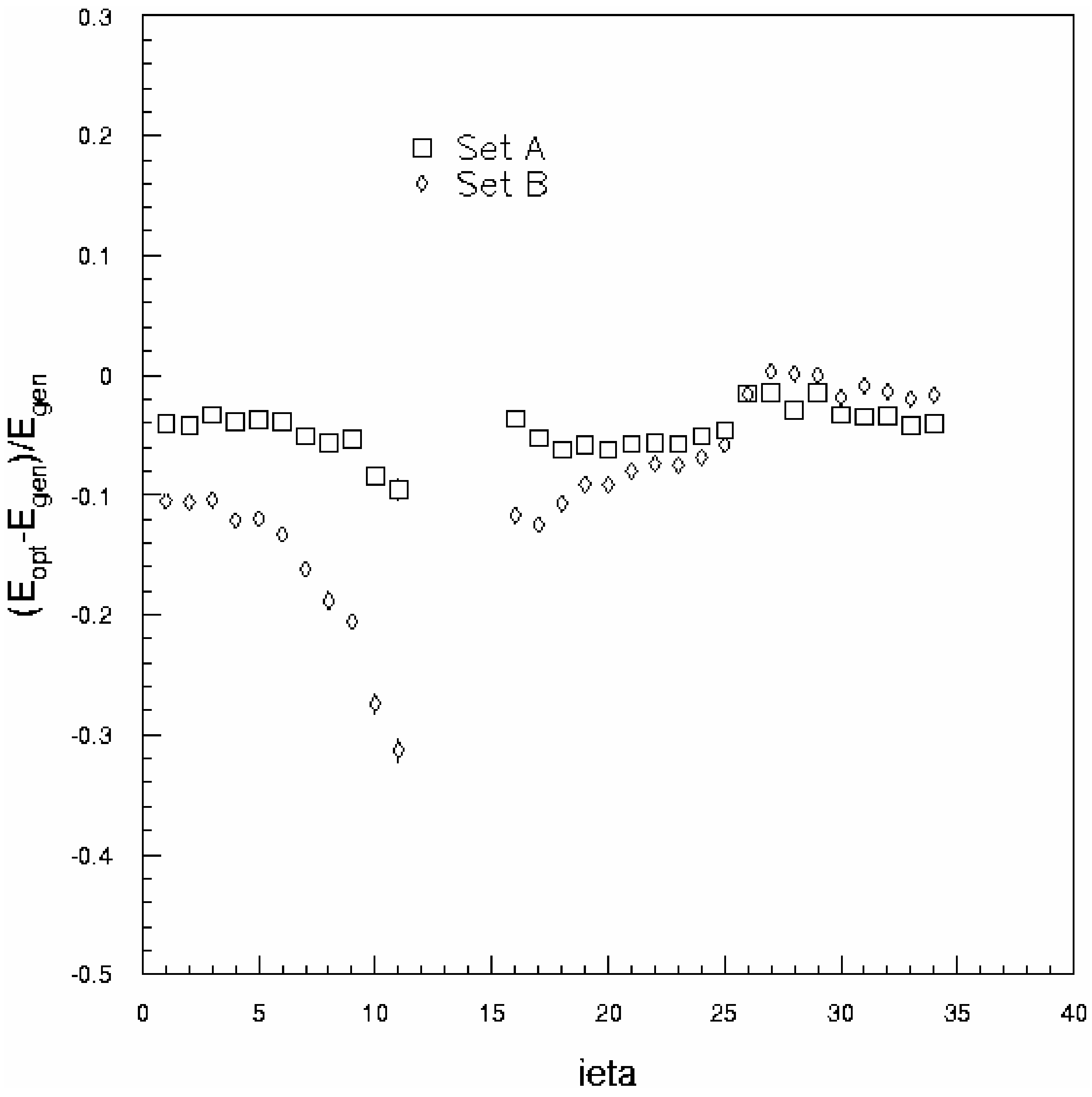
TrigSim Weights

- Calculated for offline, mixture geom.
- both calorimeter and preshower energies were used in the optimization
- η–independent
- for comparison, same offline weights were calculated for the plate geom.
- same method and samples as set A
- electrons with $|ieta| \leq 11$ are used for the 5 CC weights, and $16 \leq |ieta| \leq 33$ for the 5 EC weights
- applied to calorimeter energy only (situation at L1)
- call them set B

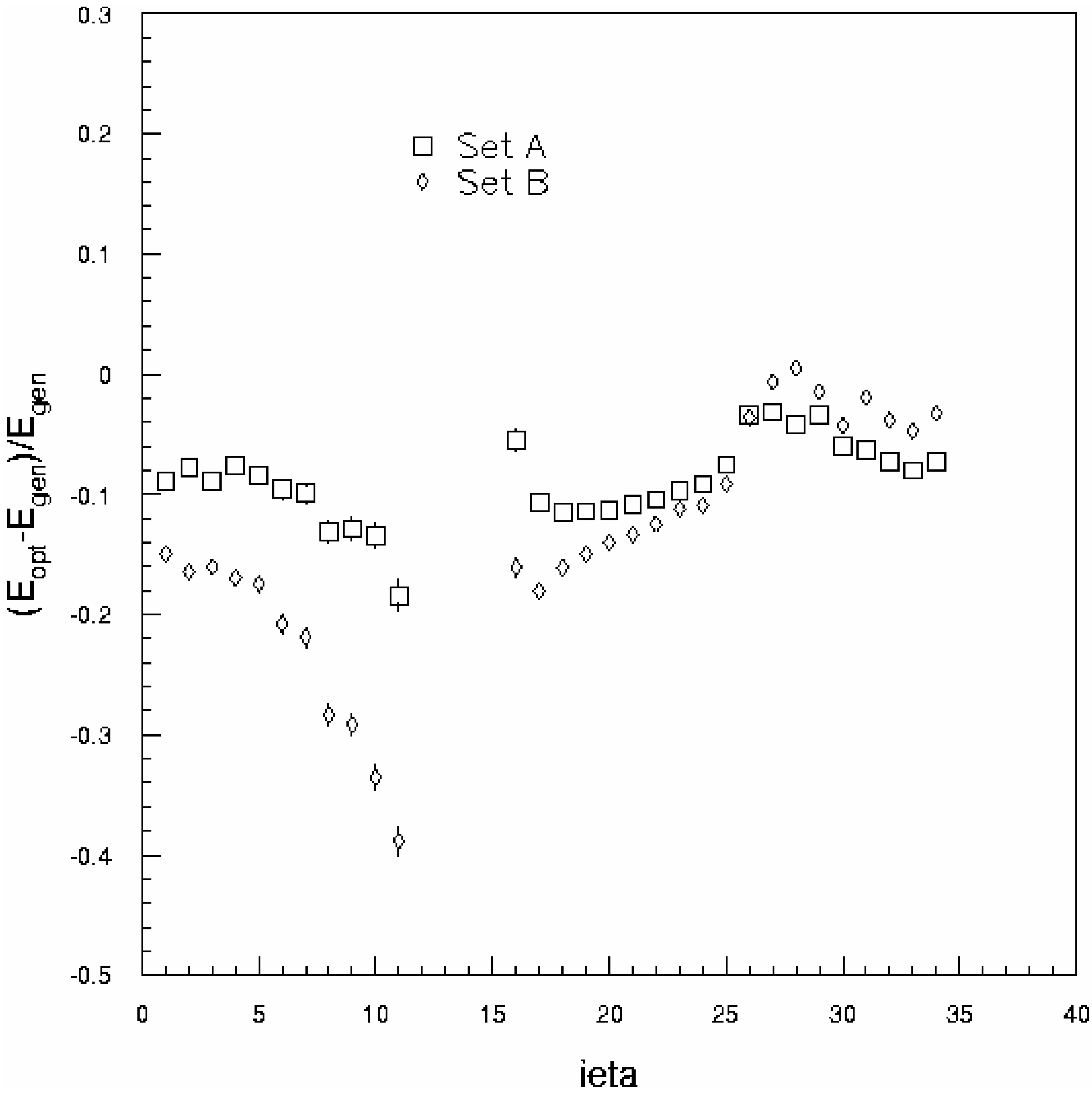
40–60 GeV electrons



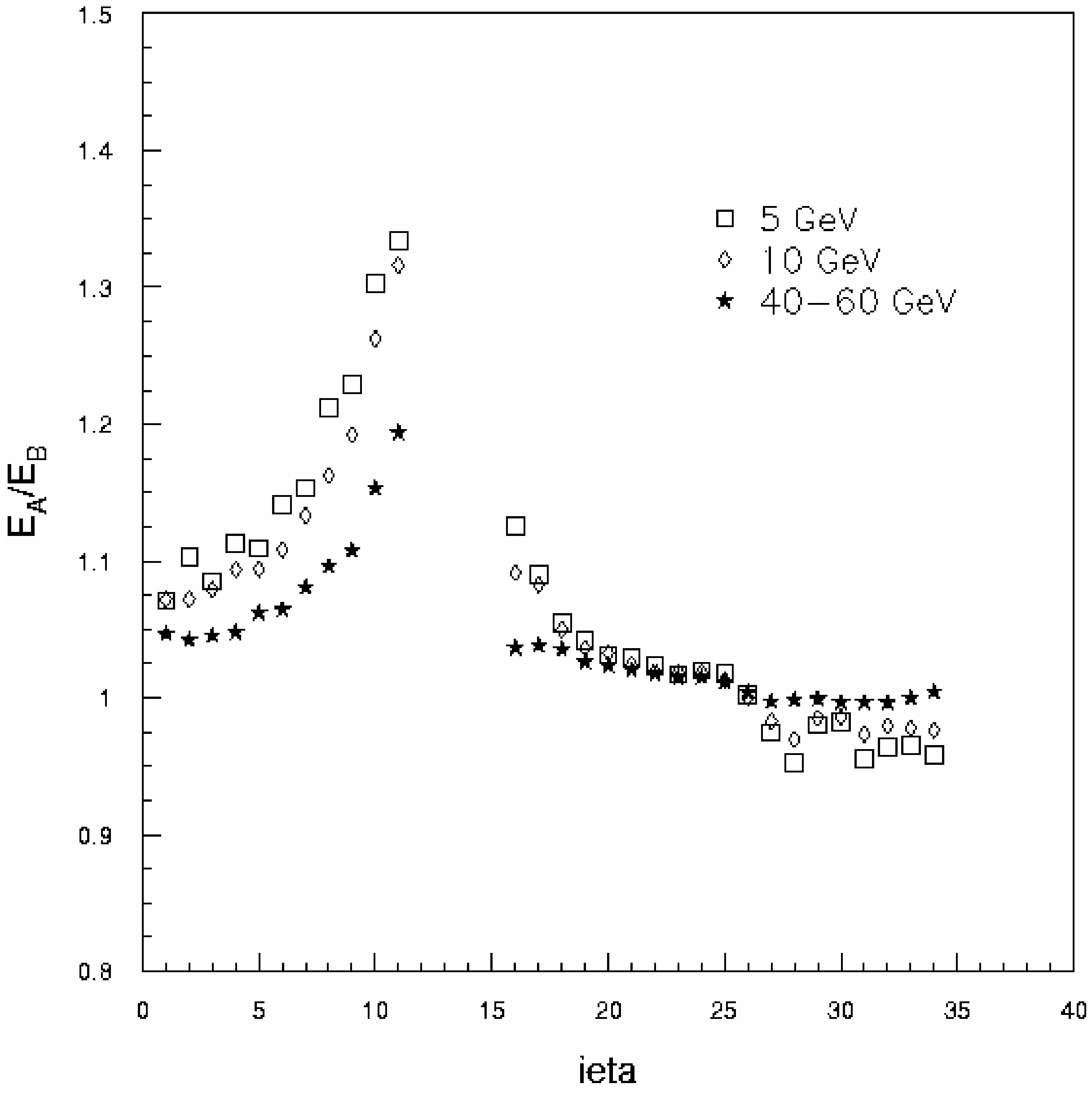
10 GeV electrons



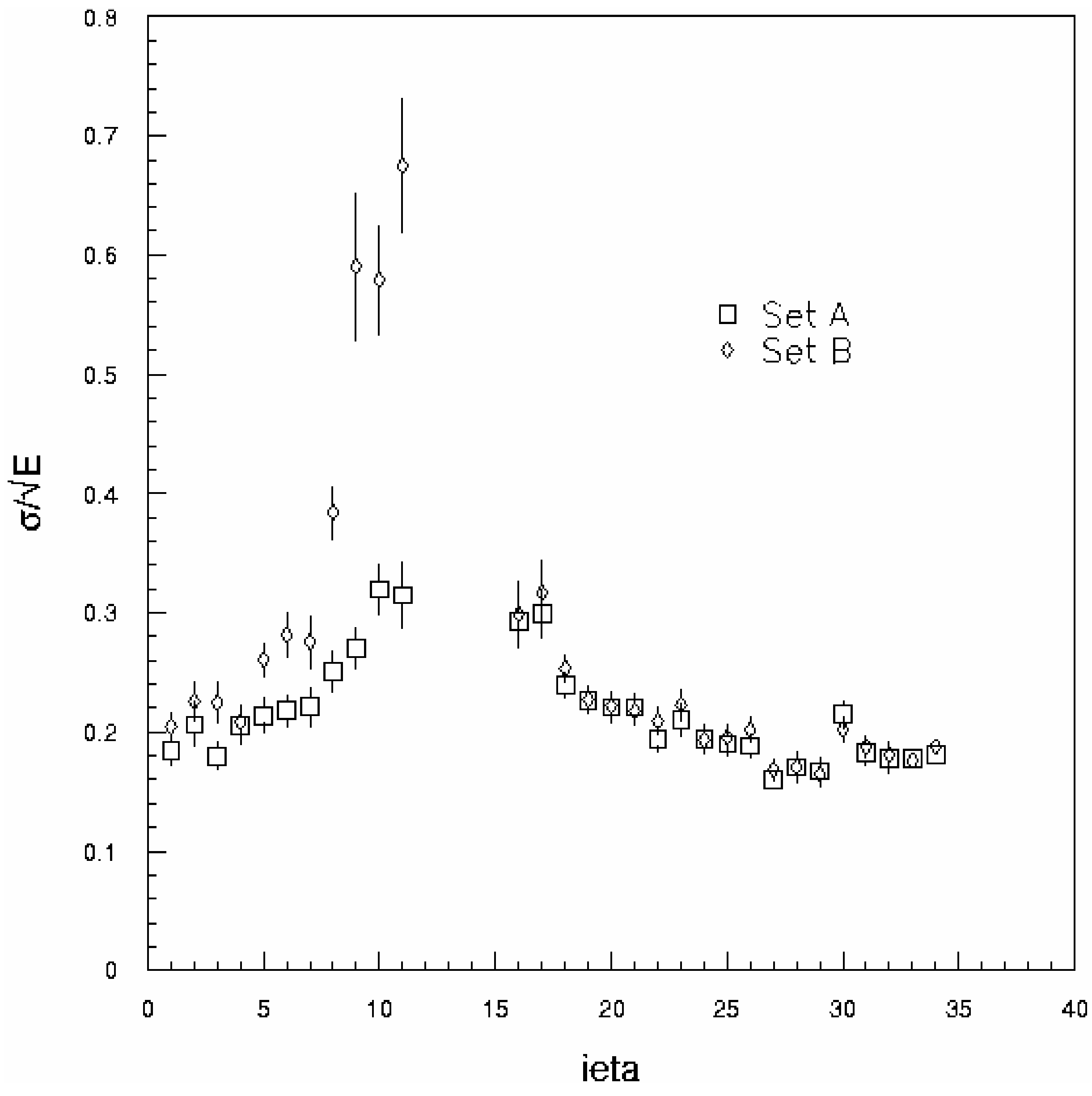
5 GeV electrons



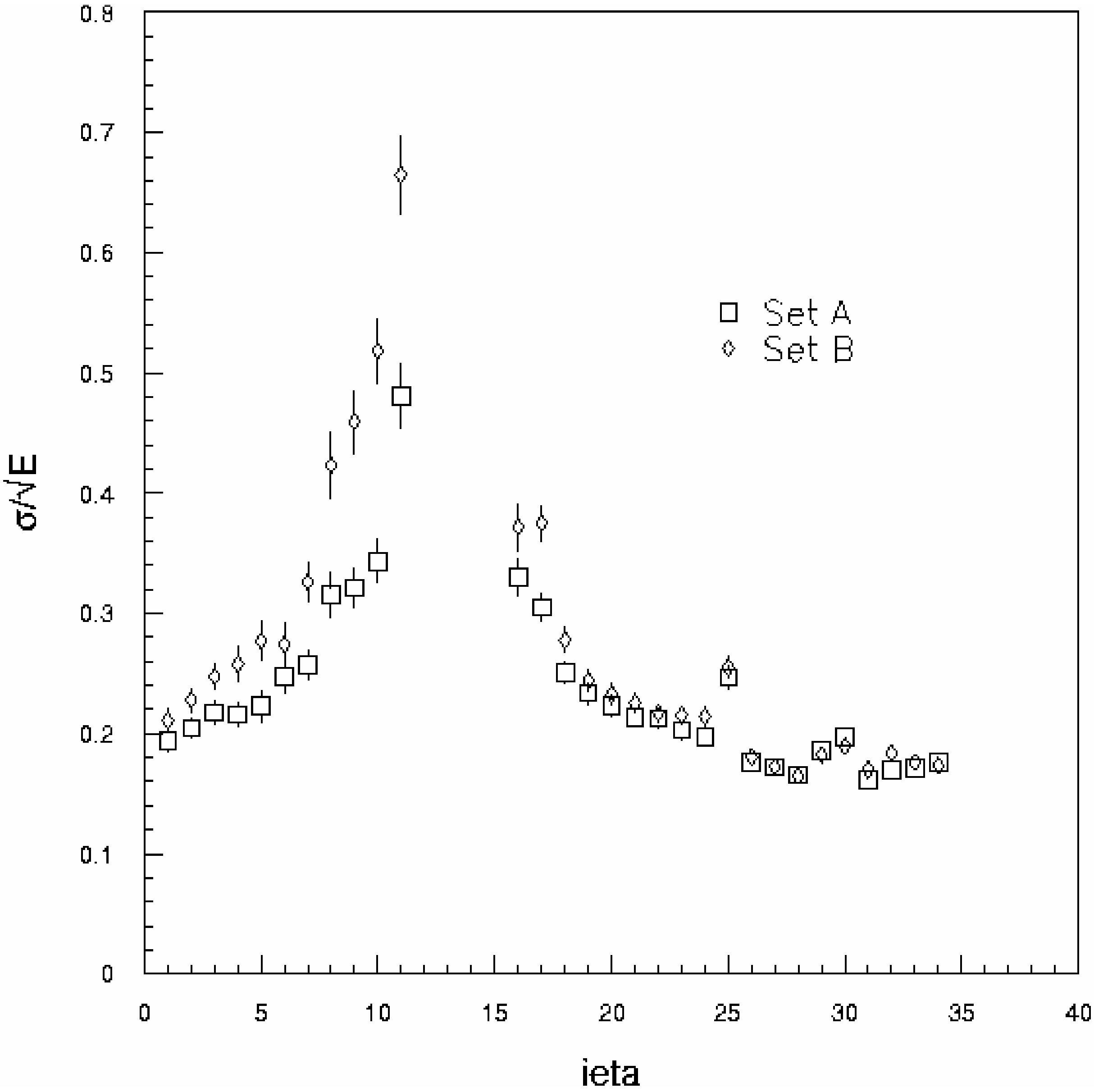
Ratios of Energy Responses



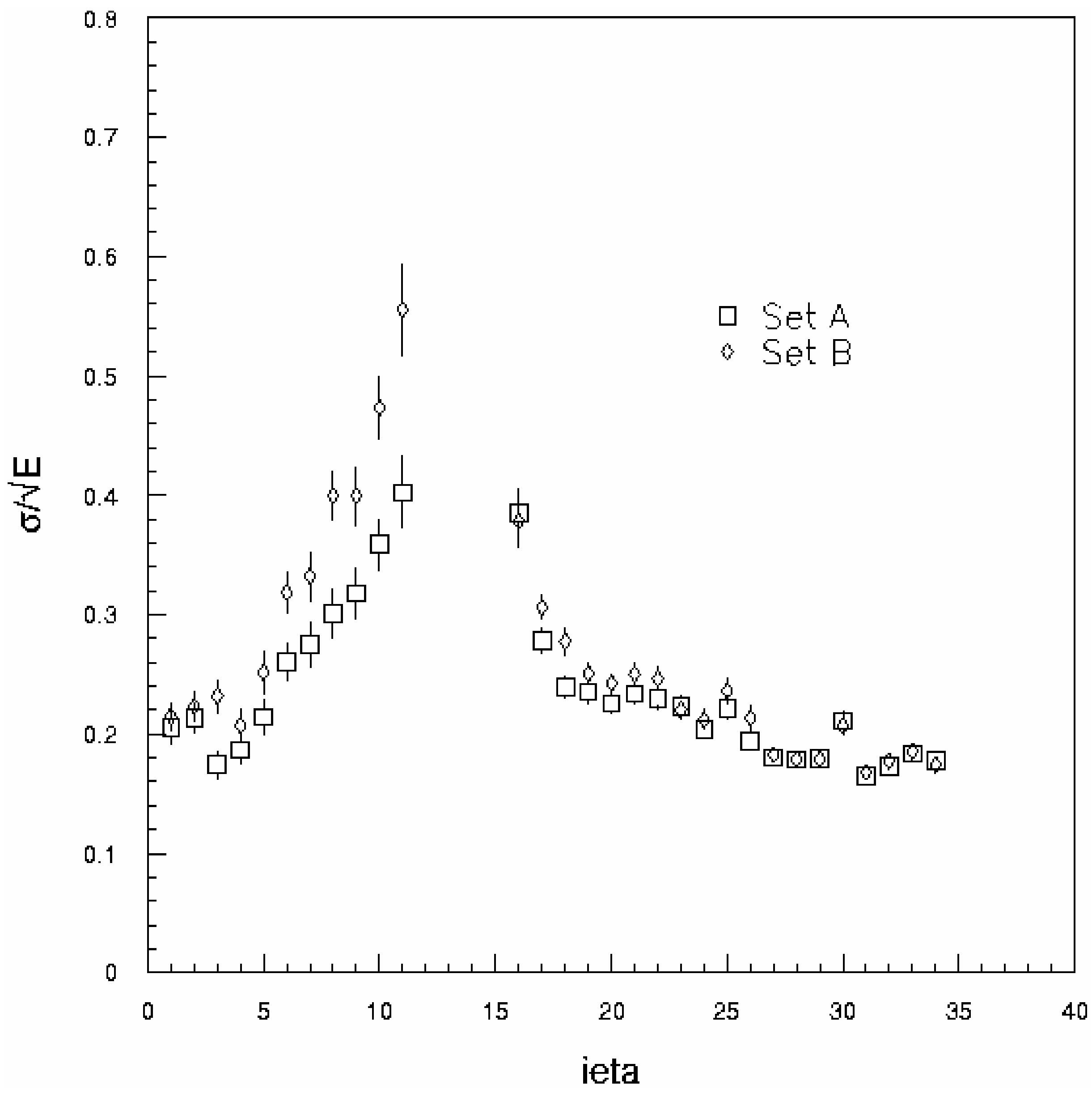
40–60 GeV electrons



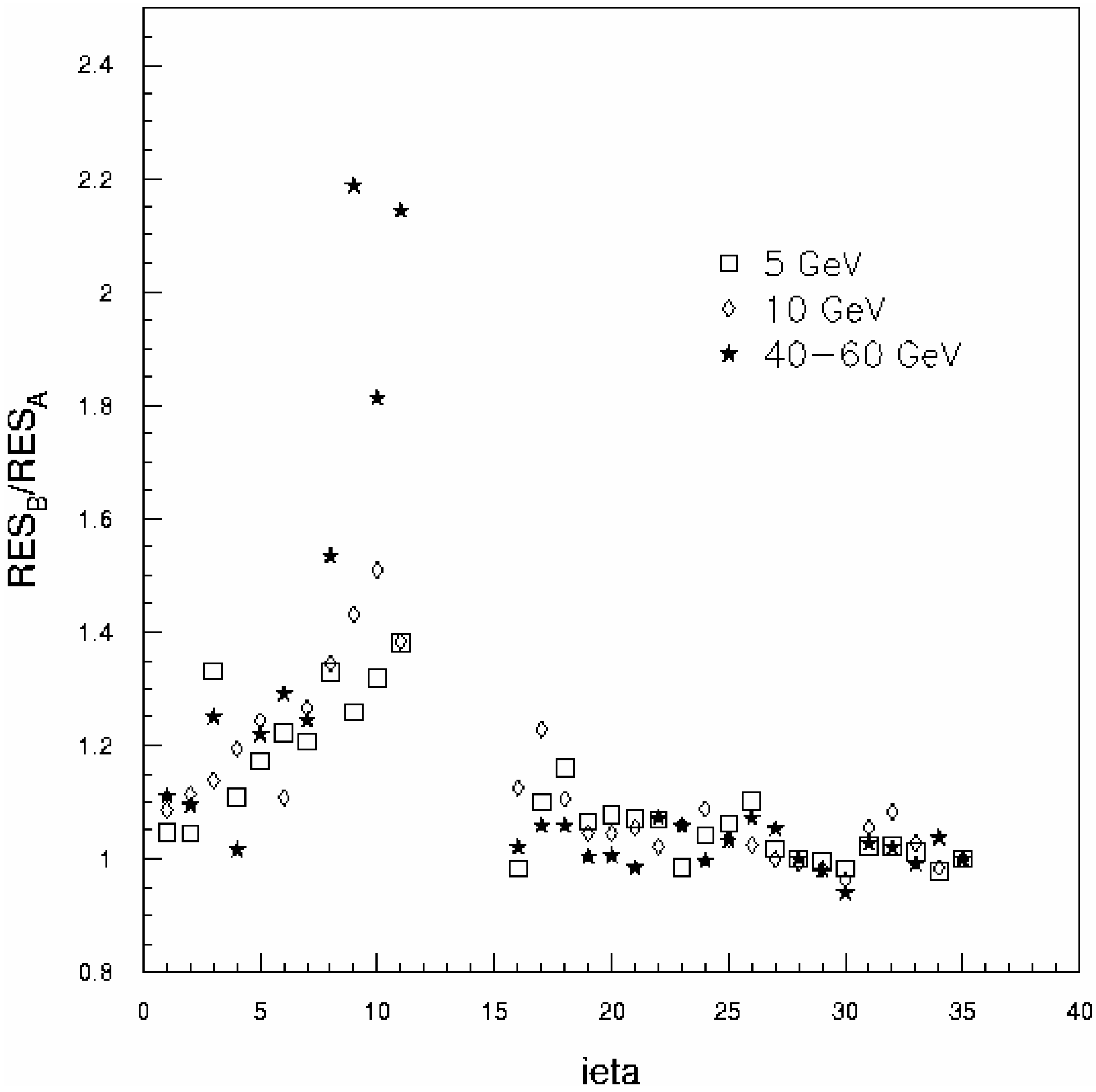
10 GeV electrons



5 GeV electrons



Ratios of Resolutions



Conclusions

- Recommend using set A for L1 CAL simulation. (p08?)

Doc

D0notes:

- 3833 ‘EM Sampling Weights for the L1 Calorimeter Trigger’
- 3834 ‘Comments on Calorimeter

  Sampling Weights for the L1 Trigger Simulation’

For offline weights:

- 3535 ‘Electron and Photon Energy

  Resolution in the Central Calorimeter for Run 2’
- 3661 ‘Optimization of the calorimeter

  response for the Monte Carlo Challenge 99 Phase I’