The ERT emc threshold study based on level2 trigger code

K. Okada, H. Torii (Feb. 13 2002)

Introduction Since DST production will take time, it will be helpful for understanding ERT performance analyzing with the level2 trigger code.

Procedure We selected scaled minimum bias (BBC||NTC) events and calculated sum of energy deposit for both "EMC2x2 non-overlapped tile" and "EMC4x4 overlapped tile". And the maximum tile for each super module(SM) was selected. SM is a unit of ERT trigger bit. Efficiency as a function of energy deposit will be simply obtained from "number of SM with trigger bit" divided by "number of SM".
But we have to mask off some SMs, because new hot channels have appeared after the last hot channel list update.

results Table 1 shows the files used in this analysis. They are total 248 files and they were taken after the last ERT changing.
Figure 1 shows the result for 3 different trigger bits (2x2,4x4a,4x4b). And figure 2 to figure 9 depict the result for each 8 sector. The shapes look different.
Number of masked channels(during the run and additional hot channel) are shown in Table 2.

summary As shown in Table 2, "live" SM is 74,72 and 72% for 2x2,4x4a and 4x4b, respectively. We can recover SM's masked in off-line by masking some bad tubes (instead of masking SM) or by the better calibration .

If we define energy threshold as a point at 50%, we can say 0.75GeV, 2.5∼3GeV and 3∼3.5GeV for 2x2,4x4a and 4x4b, respectively.

More detail study can be done after installing ERT packet to DST production.

run	file	number of files per run
40216	0∼49	50
40118	0∼5	
	12∼23	
	61,63,65,.....∼87	32
40121	0∼13	14
40122	0∼63,65	65
40127	0∼11,13	13
40129	0∼63,74,75	66
40130	0∼7	8
total		248

Table 1. List of files used in this analysis

	2x2	4x4a	4x4b
#SM masked during the run	38	42	41
#SM masked in off-line analysis	8	8	8
total	44	48	48

Table 2. Number of masked SM both in online and in off-line(total 172SM)

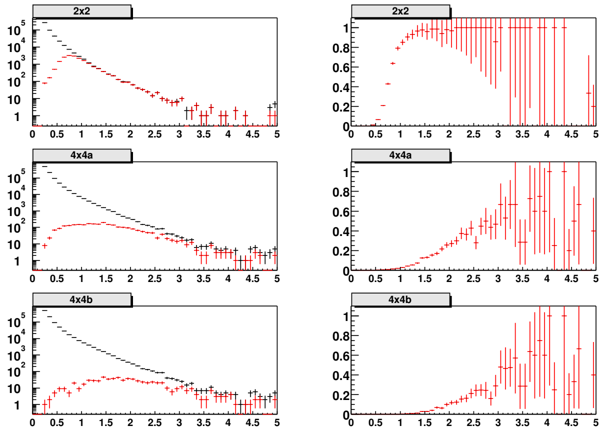

Fig. 1. left:deposited-energy[GeV] vs. entry(all and with trigger bit), right: efficiency

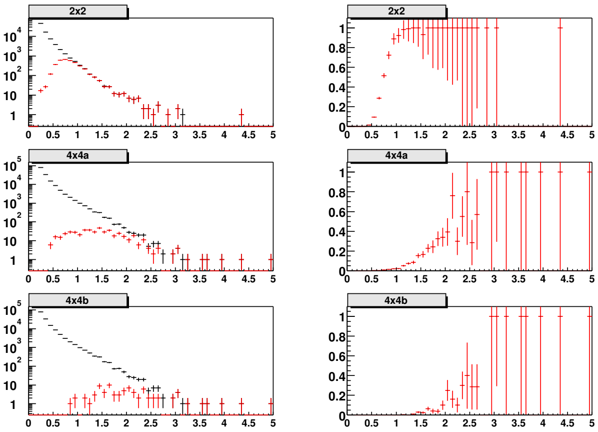

Fig. 2. west sector 0 (PbSc)

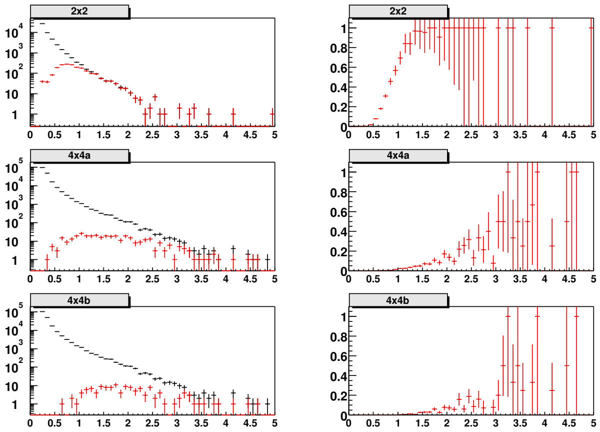

Fig. 5. west sector 3 (PbSc)

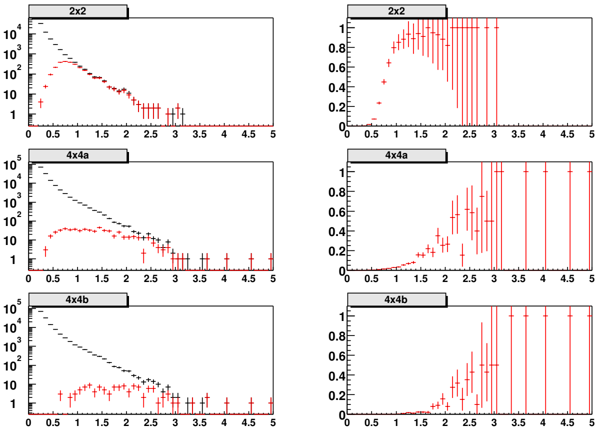

Fig. 3. west sector 1 (PbSc)

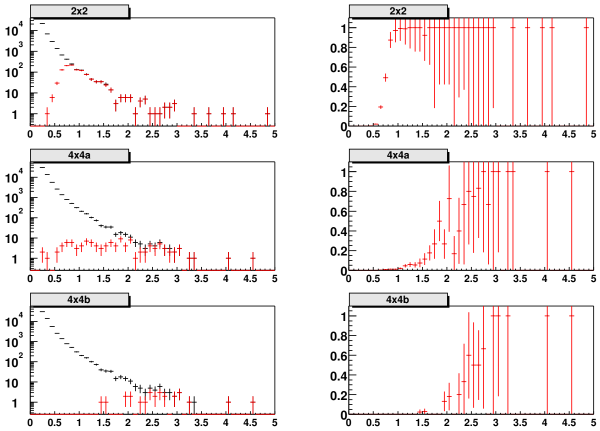

Fig. 6. east sector 0 (PbGl)

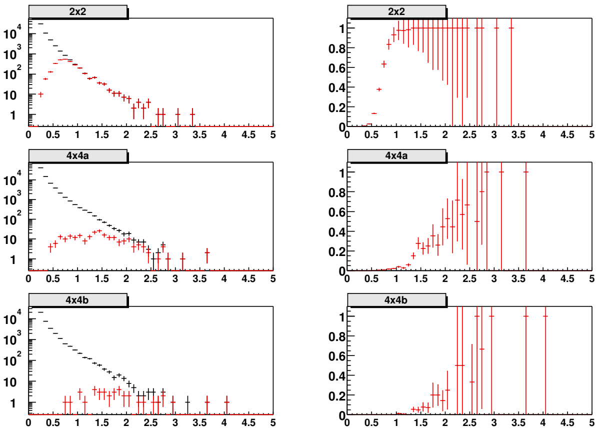

Fig. 4. west sector 2 (PbSc)

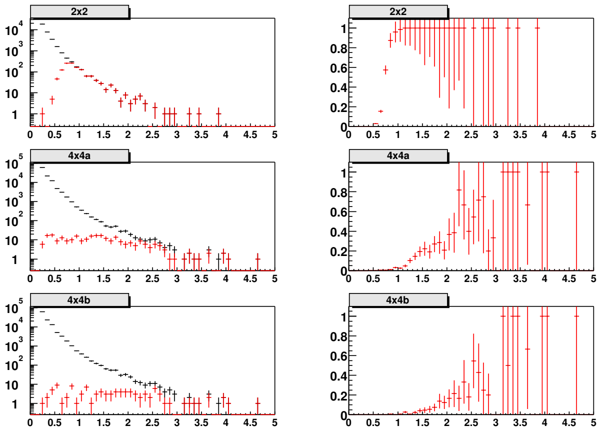

Fig. 7. east sector 1 (PbGl)

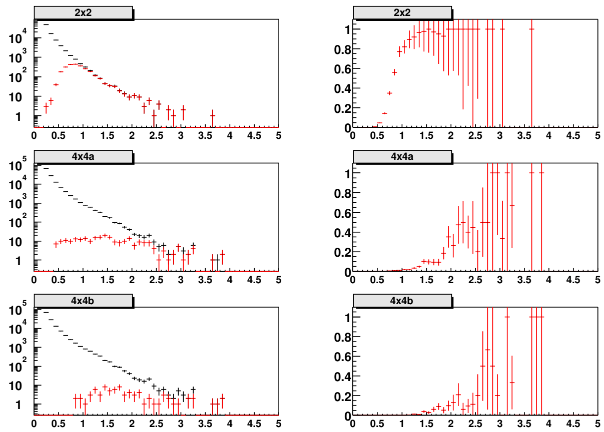

Fig. 8. east sector 2 (PbSc)

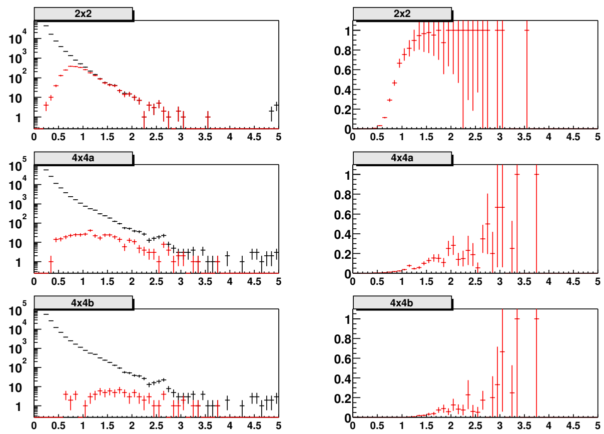

Fig. 9. east sector 3 (PbSc)