Correction of DEDX for MDCII

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July 14, 1999

OUTLINE

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1. Figure 1 and 2 are MDCII angular distribution (3.55 GeV, 1998)
2. Figure 3 and 4 are MDCI ($4.03 GeV$) data show that generator is no problem.
3. Above figures showed that DEDX of MDCI(PHMP8,no caliberation) heigher much more than it in MDCII. It is guessed that disagreement between M.C. and data is due to the threshold effect of MDC-II.

2 Method of correction

1. By checking codes of SOBER nd DRUNK we found that no angular effect inluded in the simulation sample. I add the angular effect in the dedx simulation by setting (dedx/$sin\theta$) (in dtime.f)
2. set a thershold of DEDX for MDC-Q (in deordr.f by a sober card), and the threshold value is adjusted by fitting Nhit-DEDX of M.C. to experimental data.
3. transforming the thershold of DEDX for MDC-Q channel to MDC-T channel (in dcordr.f)
4. exchange order 'call deordr' and 'call dcordr' (in rawout.f), in order to make transforming the thershold from Q to T channel.

5. After setting the threshold, angular effect for dedx is rejected(in deordr.f) in order to keep the agreement with the reconstruction procedure(Figure 5 shows 3 trips of paricle ID by dedx clearly).

6. modify realization constent file. MDC wire efficince = 1.0 to avoid the double counting of MDC wire efficince after setting the threshold of dedx.

3 Results of the correction

After above correction for the MDC dedx threshold effect, Monte Carlo simulation results consist with data. Figure 6 and 7 show those results.

1. By adjusting a siutable threhold of dedx, hit number of dedx of MC sample consit with data.

2. Data angular distribution of track is reproduced by MC.

3. Other distributions of MC are still consist with data, or are improved better then them before.

4. Improvements of Monte Carlo simulation for 98 data by v100 at 2.6 GeV, 3.2 GeV, 3.4 GeV, 3.55 GeV, 4.6 GeV and 5.0 GeV are shown in another file.

5. Acceptence(98 data):

Table 1: Acceptence(for 98 data by v100), where 'old' values are no correction of angular effect, and 'new' values are included angular effect. R-2pr values are reletive error for the events more than 2 prong, and R-3pr are the reletive error for the events more than 3 prongs.

2.6GeV		3.2GeV		3.4GeV		3.55GeV		4.6GeV		5.0GeV	
old%	new%	old%	new%	old%	new%	old%	new%	old%	new%	old%	new%
55.94 R-2pr	55.23 -1.3	64.90	66.30 +2.2	70.40	70.11 -0.4	69.27	71.63 +3.3	86.44	85.96 -0.6	88.42	87.79 -0.7
41.32 R-3pr	40.41 -2.2	51.58	52.66 +2.1	57.96	57.38 -1.0	56.55	59.28 +4.6	78.08	77.08 -1.3	80.73	79.55 -1.5

4 Conclusion and discussion

1. Monte Carlo simulation showed that angular distribution of track is due to the threshold effect of dedx of MDCII.

2. Correction presented here can reproduce the angular effect of track which caused by the threshold effect of MDC dedx.

3. The reason of acceptence changed is due to the MDC wire efficinces being set to 100%, and dedx threshold contribution to the MDC wire efficince is caculated more precisely.

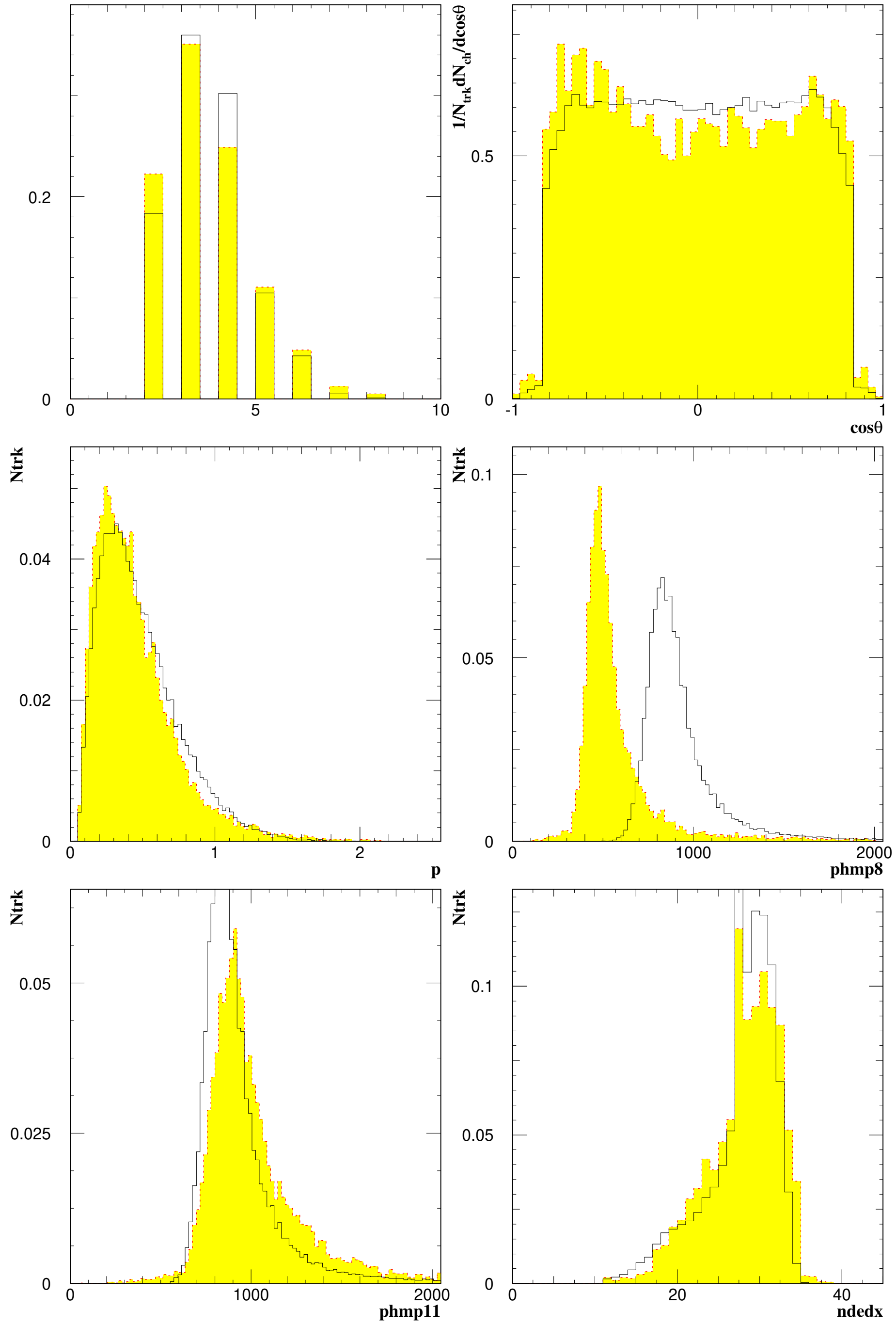

Figure 1: Shadow are BES-II experimental hadronic events shape distributions in 3.55 GeV, lines are those of LUND model with default parameters. There are a difference in the angular distribution between data and M.C.

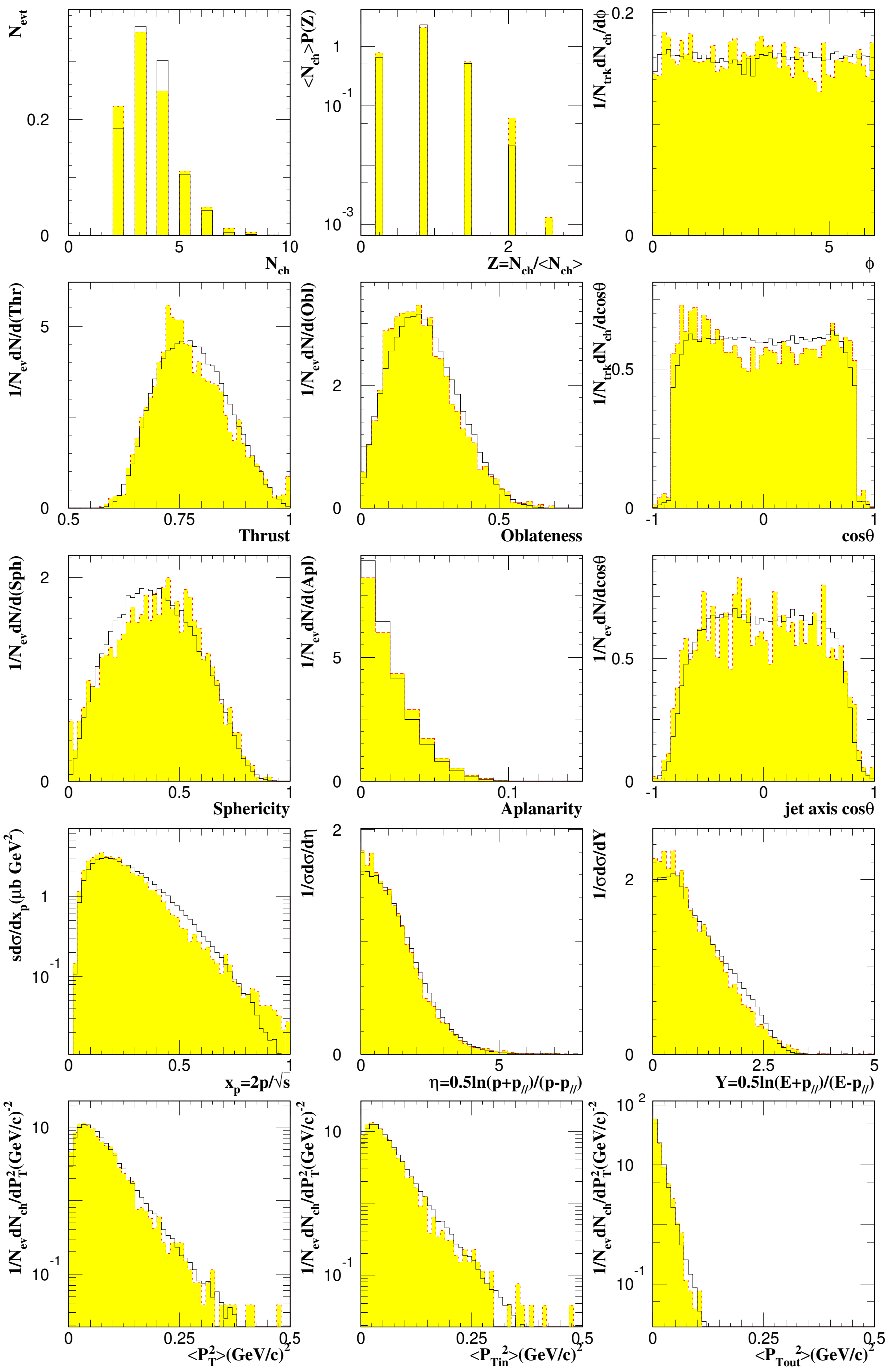

Figure 2: Shadow are BES-II experimental hadronic events shape distributions in 3.55 GeV, lines are those of LUND model with default parameters. There are a difference in the angular distribution between data and M.C.

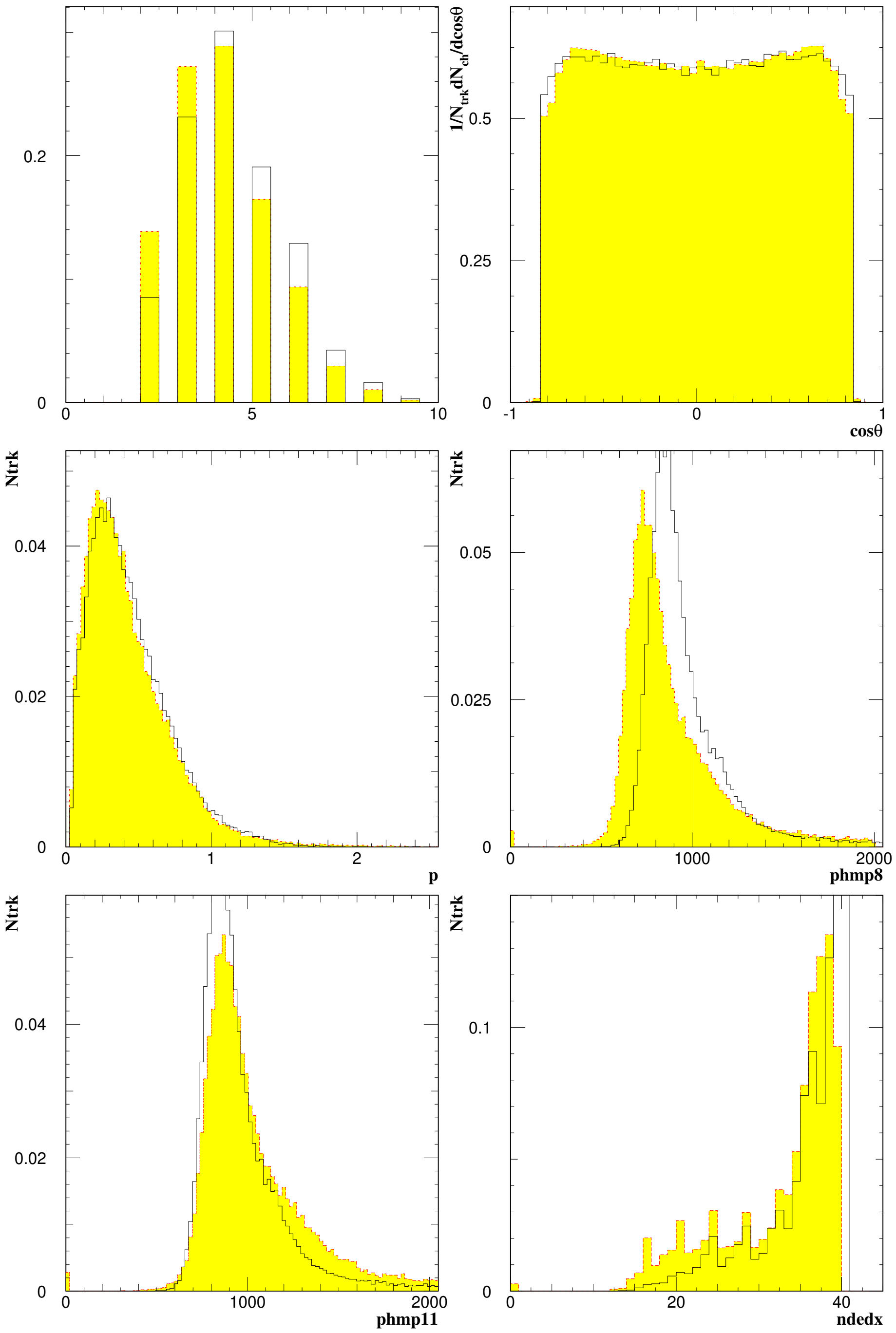

Figure 3: Shadow are BES-I experimental hadronic events shape distributions in 4.03 GeV, lines are those of LUND model with default parameters. M.C. consist with data, as well as their angular distribution.

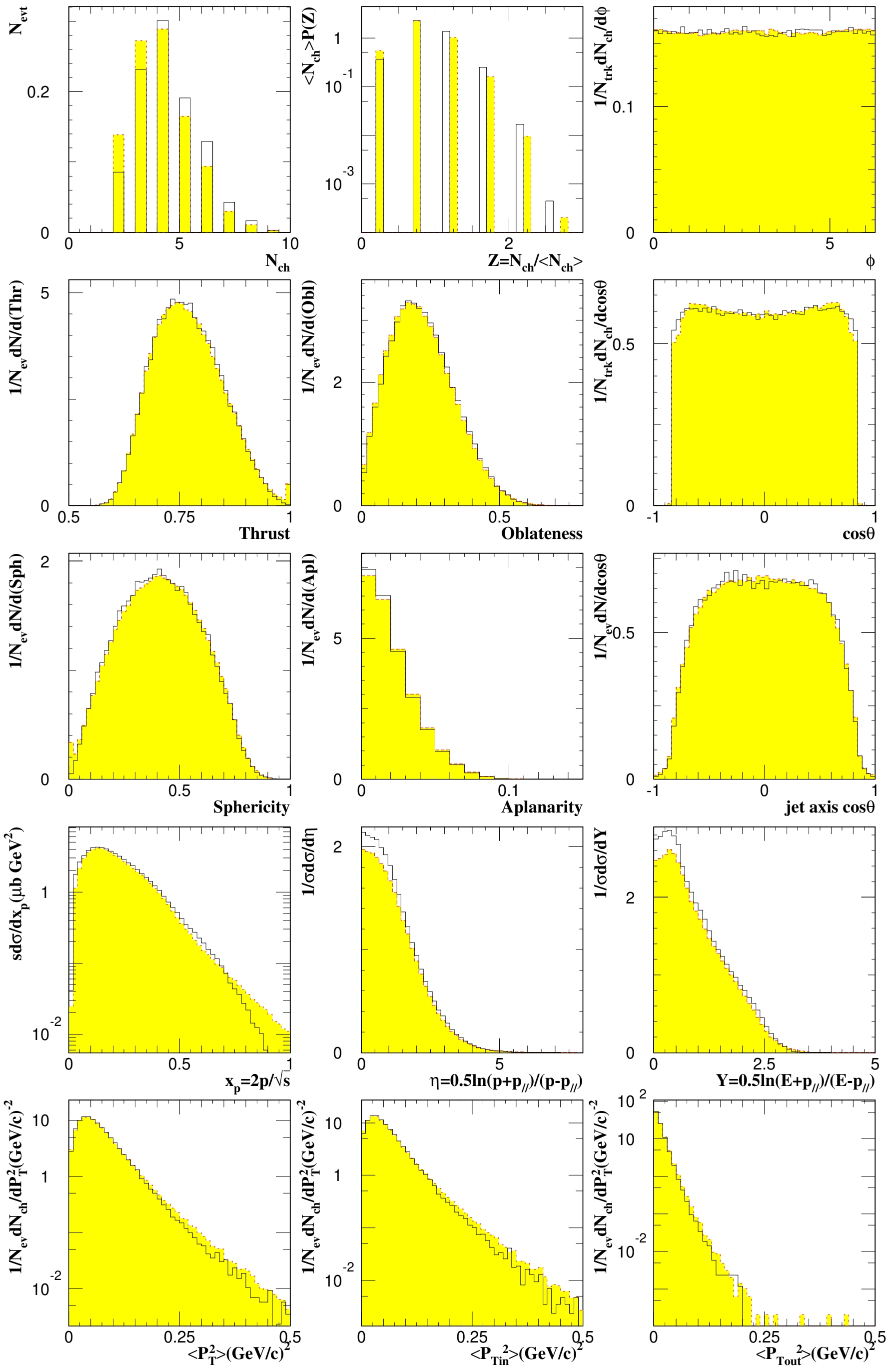

Figure 4: Shadow are BES-I experimental hadronic events shape distributions in 4.03 GeV, lines are those of LUND model with default parameters. M.C. consist with data, as well as their angular distribution.

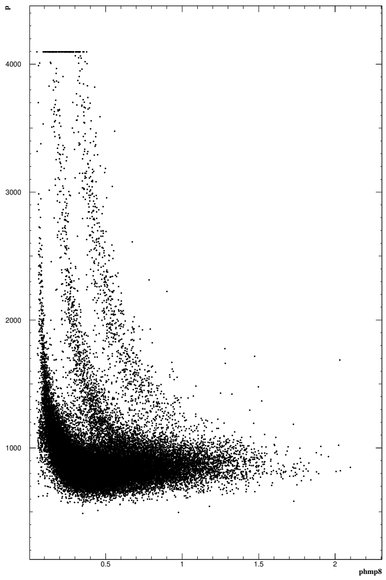

Figure 5: In order to keep the agreement with the reconstruction procedure, after setting the threshold, angular effect for dedx is rejected in the M.C. sample, and 3 trips of paricle ID by dedx($\pi/K/p$) is still clearly.

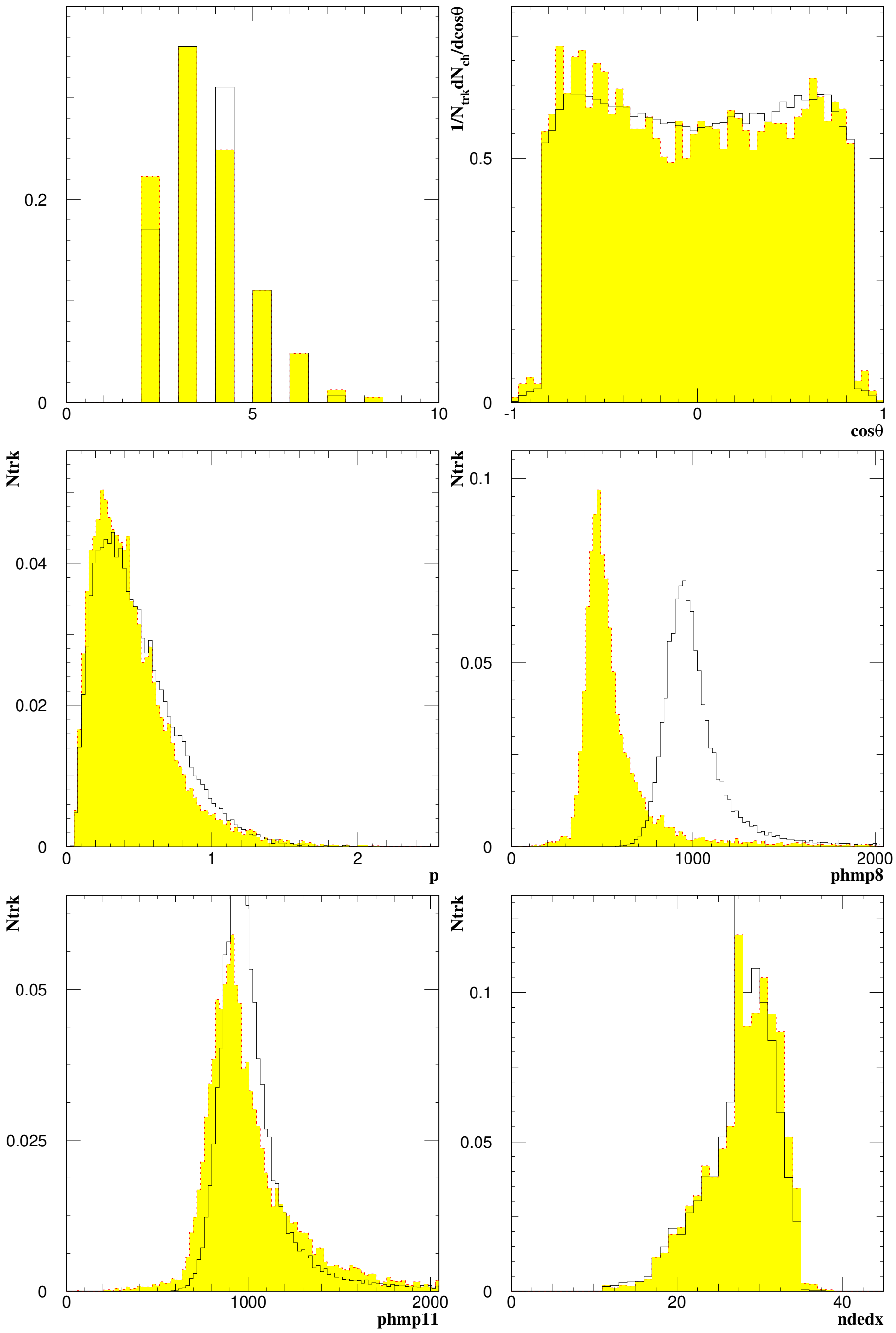

Figure 6: Shadow are BES-II experimental hadronic events shape distributions in 3.55 GeV, lines are those of LUND model with default parameters. The difference of angular distribution between data and M.C. has been rejected.

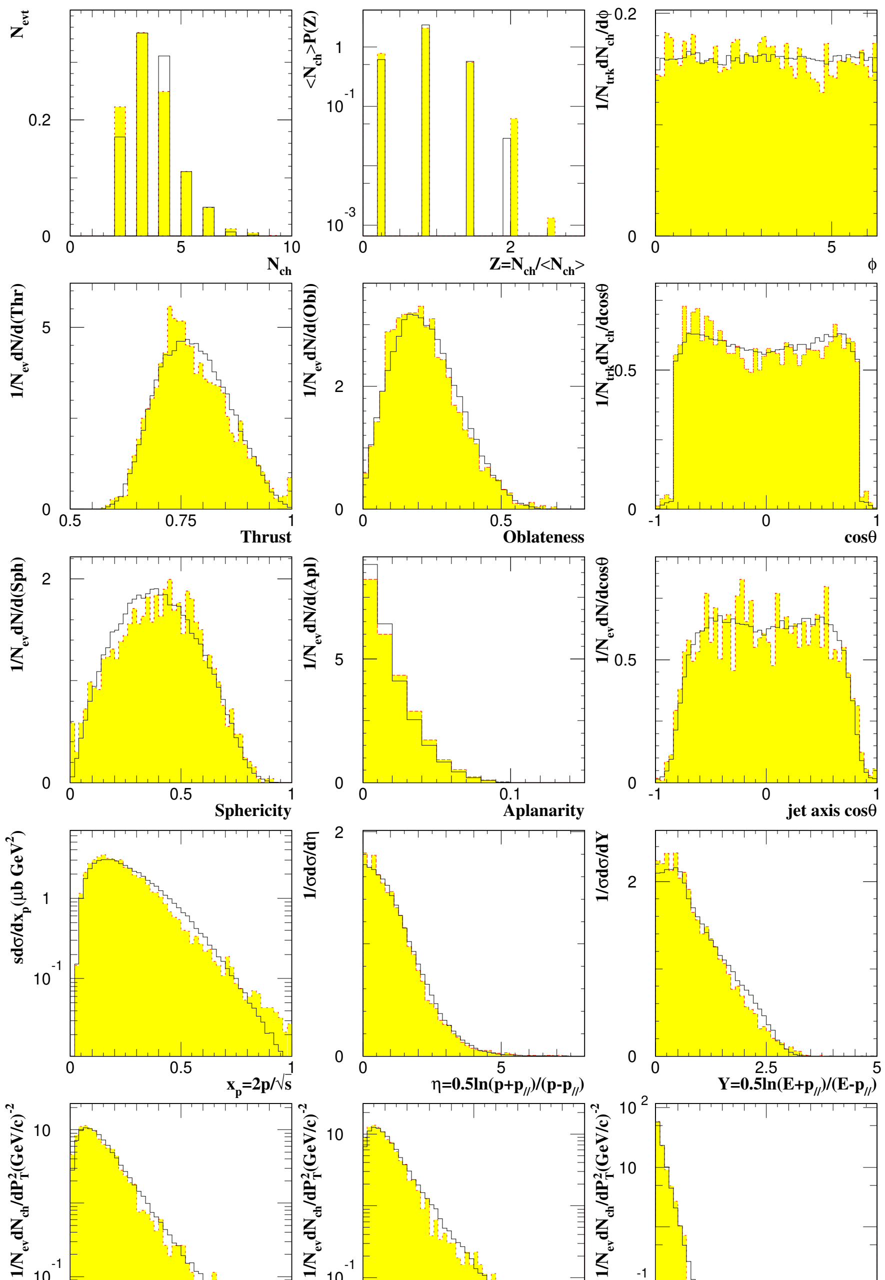

Figure 7: Shadow are BES-II experimental hadronic events shape distributions in 3.55 GeV, lines are those of LUND model with default parameters. The difference in the angular distribution between data and M.C. as been rejected and some other distribution are improved too.