Report for lund-charm.f Generator

J.C. Chen

January 25, 2000

1 INTRODUCTION

Generator lund-charm.f is designed for the simulation of hadronic events produce at BEPC energy region. It combined LUND with EICHTEN model to produce both continuum energy event and charm mesons events the mixing ratio calculated automatically depended on the input E_{cm}. When E_{cm}=(3.726-4.5)GeV, uds quarks events are produced by LUND, and the charm ratio is calculated by EICHTEN, charm events are produced by BES's charm mesons generators. In the other continuum energy region, this generator is the LUND gnerator and with some tuned parameters. Following figures are MC results which compared with data

Table 1: Parameters of Jetset7.4 tuned in the lund-charm.f generator

Dynamic parameter				Particle ratio			
Parameter	Def	Tuned	Description	Parameter	Def	Tuned	Description
PARJ(21)	0.36	0.5	σ, width of Gaussian	parj(11)	0.5	0.60	V/P ratio of u&d
PARJ(33)	0.8	0.6	diquark minium mass	parj(12)	0.6	0.66	V/P ratio of s
parj(126)	2GeV	1GeV	gg minimum mass	parj(14)	0	0.62	axial Vector ratio
parj(25)	1.0	0.5	η extra suppression	parj(15)	0	0.12	scalar meson ratio
				parj(16)	0	0.12	another axial Vector
				parj(17)	0	0.10	tensor meson
				parj(1)	0.1	0.09	p(qq)/p(q)
				parj(2)	0.3	0.4	p(ss)/p(uu)

obtained in 1999 at BES R scan project. In the MC results, τ events have been included when E_{cm}=4.03,4.27,4.49 GeV, which generated by KORALB. The effect of dedx threshold has been included by realization of MDC with a sober card 'DEDXSYS THRESHOLD 640'.

Table 2: χ^2 of hadronic events shape distribution,2.0GeV

	N_t	N_{ch}	N_{neu}	Sphe	Thru	Apla	Obla	$cos\theta$	X_p	P_t	P_t^{in}	P_t^{out}	y	η
x2	95	9	86	45	39	0	20	41	53	27	28	2	44	34
m	10	5	10	41	39	7	30	48	46	16	15	5	27	35
x2/m	9	2	8.6	1.1	1.0	0.1	0.7	0.9	1.2	1.7	1.9	0.5	1.7	1.0
Weight	0	1	0	0.25	0.25	0.25	0.25	1	0.4	0.3	0.3	0.3	0.5	0.5

sum(X2/m)/Ndis= 7.46/6= 1.24

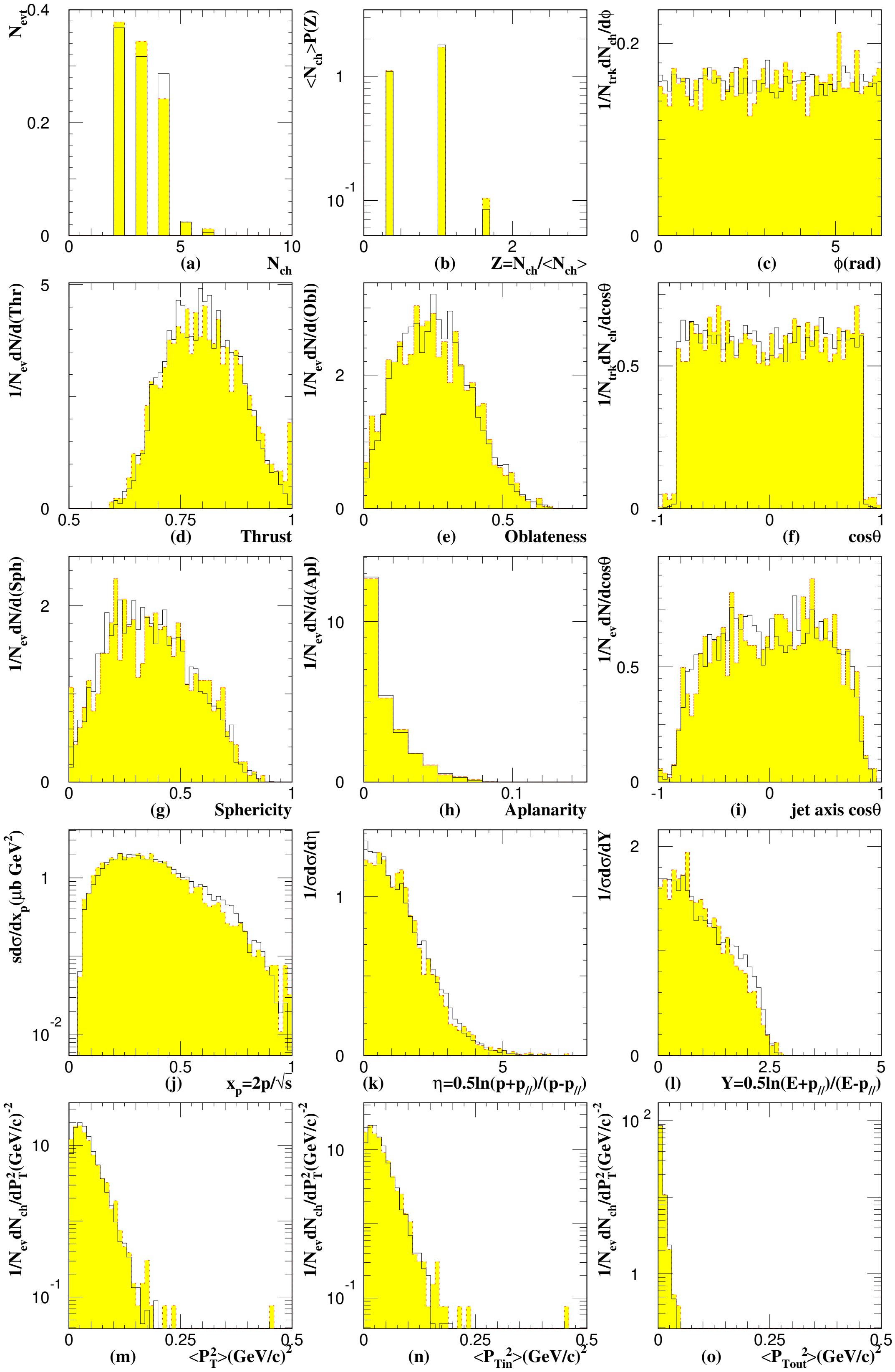

Figure 1: E_{cm}=2.0 GeV, Eff=44.9% for more than 2 prong events, and Eff=28.4% for more than 3 prong events. χ^2=1.2(1/ndf)

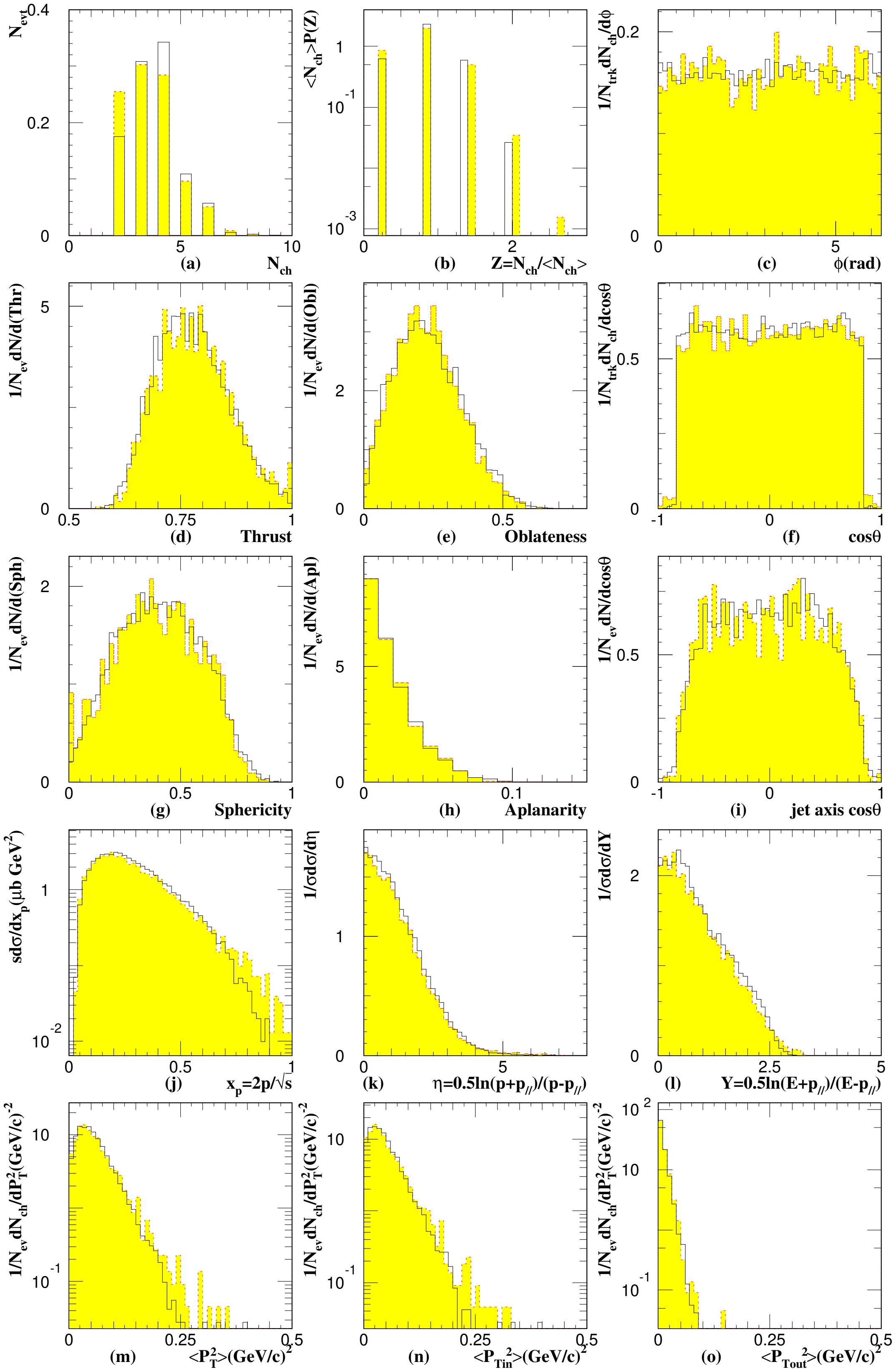

Figure 2: E_{cm}=3.0 GeV, Eff=72.1% for more than 2 prong events, and Eff=59.5% for more than 3 prong events. χ^2=2.3(1/ndf)

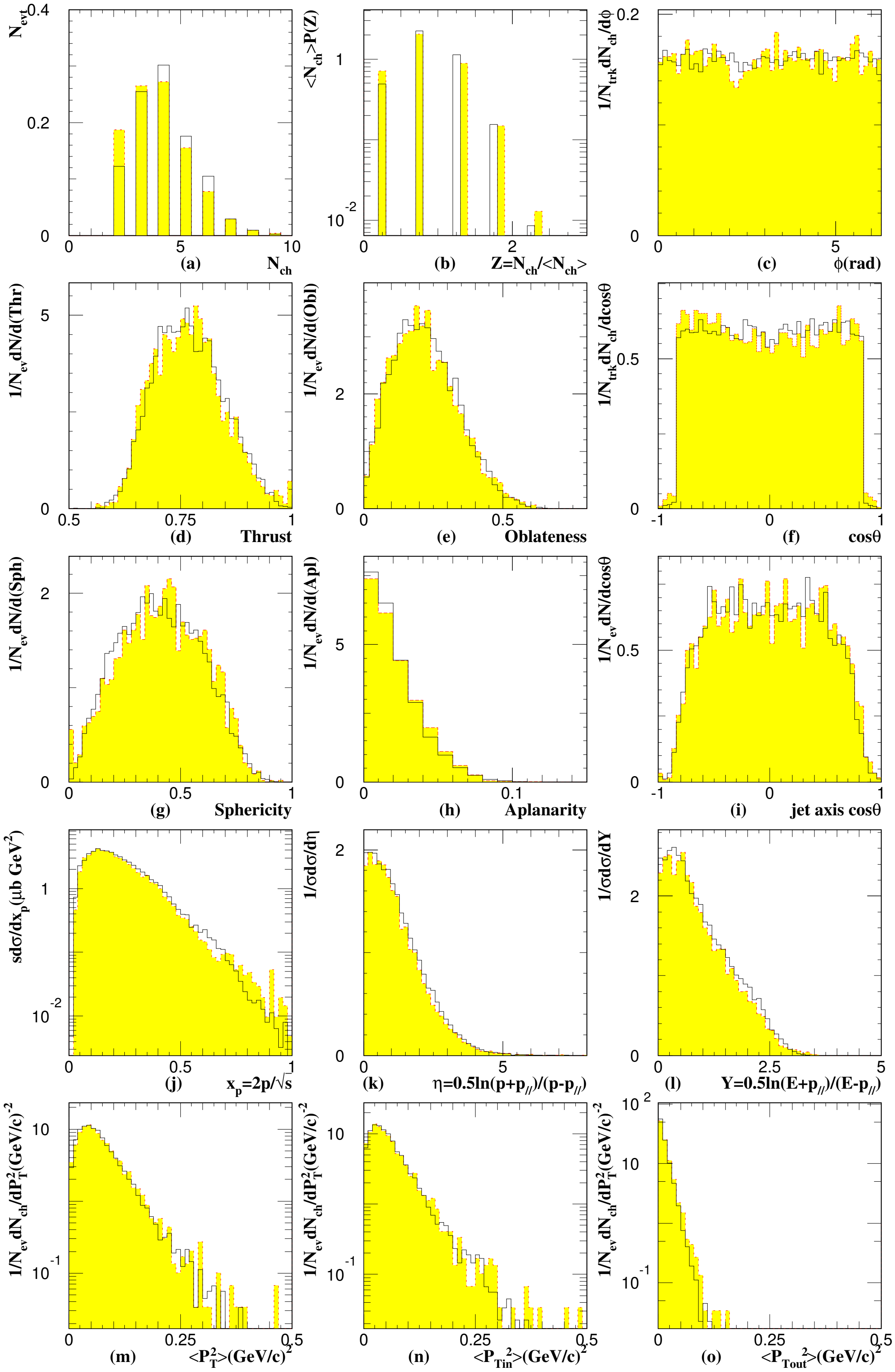

Figure 3: E_{cm}=4.03 GeV, LUND=10000, KORALB=1300, Eff=89.9/113 for more than 2 prong events, and Eff=78.9/113 for more than 3 prong events.χ^2=2.6(1/ndf)

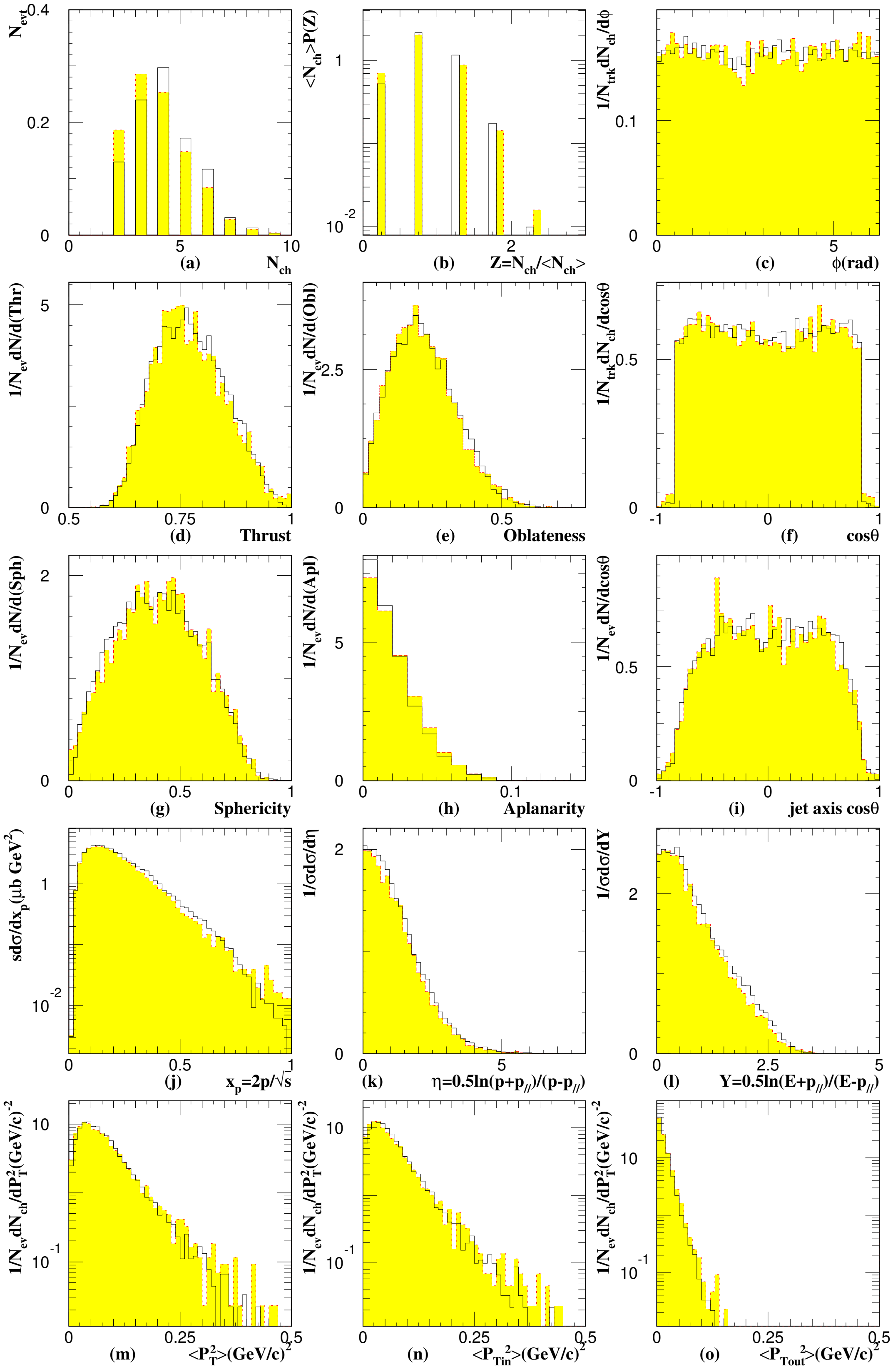

Figure 4: E_{cm}=4.27 GeV, LUND=10000, KORALB=2000, Eff=91.5/120 for more than 2 prong events, and Eff=79.6/120 for more than 3 prong events.χ^2=3.9(ndf)

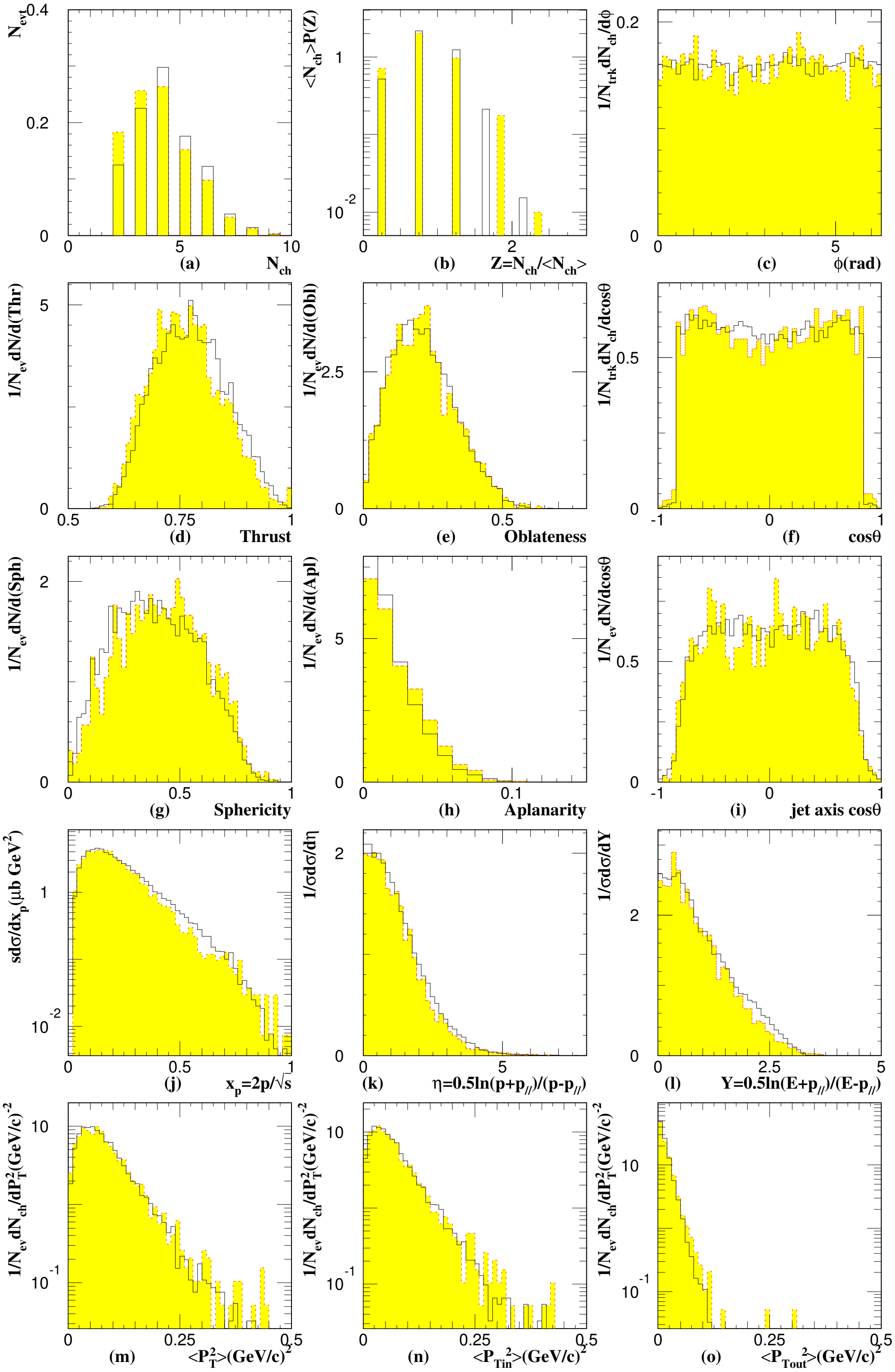

Figure 5: E_{cm}=4.49 GeV, LUND=10000, KORALB=2300, Eff=92.5/123 for more than 2 prong events, and Eff=81.0/123 for more than 3 prong events. χ^2=2.0(1/ndf)