

Réunion OPERA

17/05/11 - Florian Brunet

Outline

News from EWG meeting : 04/05/2011

Debugging session with Frank

Reconstruction of MC samples

Efficiency calculation

Shower Energy reconstruction

Outlook

News from EWG meeting : 04/05/2011

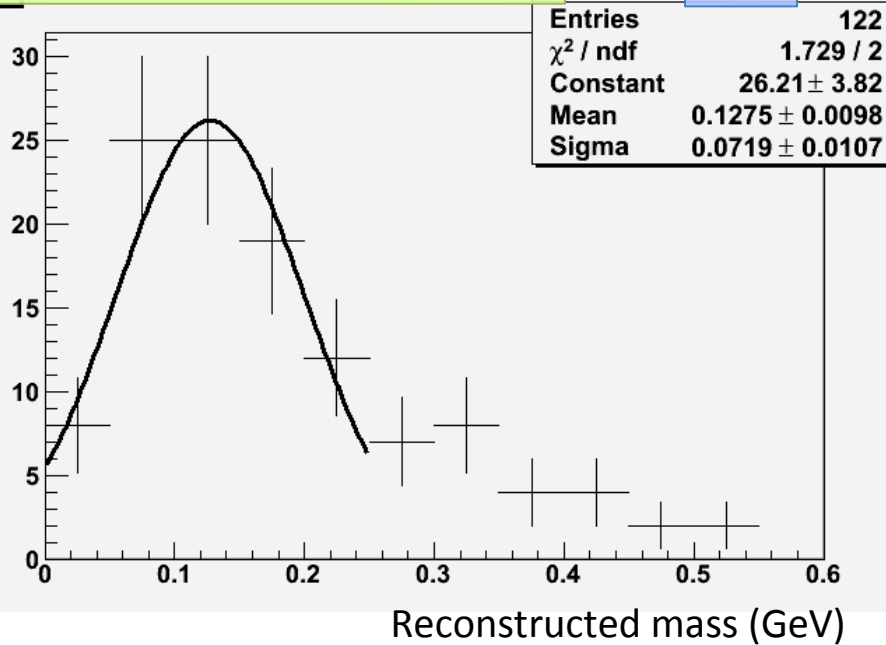
CASE1		ip (micron)									
		10		100		500		1000		2000	
dtheta (mrad)	20	60(0,09)	33(0,05)	63(0,1)	36(0,05)	66(0,1)	39(0,06)	67(0,1)	40(0,06)	67(0,1)	40(0,06)
	40	95(0,14)	39(0,06)	105(0,16)	44(0,07)	112(0,17)	51(0,08)	115(0,17)	54(0,08)	116(0,18)	55(0,08)
	60	126(0,19)	41(0,06)	138(0,21)	48(0,07)	147(0,22)	57(0,09)	150(0,23)	60(0,09)	152(0,23)	62(0,09)
	80	150(0,23)	43(0,07)	165(0,25)	50(0,08)	181(0,28)	65(0,1)	187(0,28)	71(0,11)	188(0,29)	72(0,11)
	100	170(0,26)	40(0,06)	190(0,29)	50(0,08)	206(0,31)	65(0,1)	215(0,33)	74(0,11)	217(0,33)	76(0,12)
CASE 2		ip (micron)									
		10		100		500		1000		2000	
dtheta (mrad)	20	2(0)	0(0)	4(0,01)	0(0)	10(0,02)	2(0)	19(0,03)	5(0,01)	20(0,03)	5(0,01)
	40	3(0)	0(0)	11(0,02)	0(0)	35(0,05)	9(0,01)	54(0,08)	14(0,02)	59(0,09)	15(0,02)
	60	6(0,01)	1(0)	19(0,03)	2(0)	64(0,1)	12(0,02)	87(0,13)	21(0,03)	94(0,14)	23(0,03)
	80	15(0,02)	5(0,01)	42(0,06)	7(0,01)	96(0,15)	19(0,03)	129(0,2)	32(0,05)	134(0,2)	32(0,05)
	100	31(0,05)	10(0,02)	76(0,12)	14(0,02)	141(0,21)	29(0,04)	177(0,27)	42(0,06)	181(0,28)	42(0,06)

News from EWG meeting : 04/05/2011

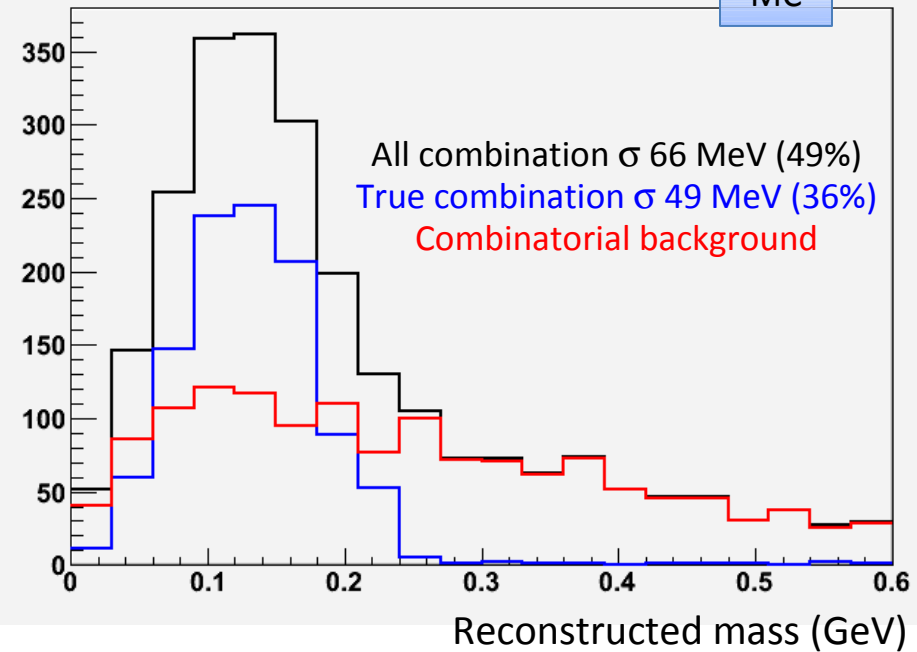
π^0 mass reconstruction

All combination in 33 events ($N_{\gamma} \geq 2$)

Data



MC

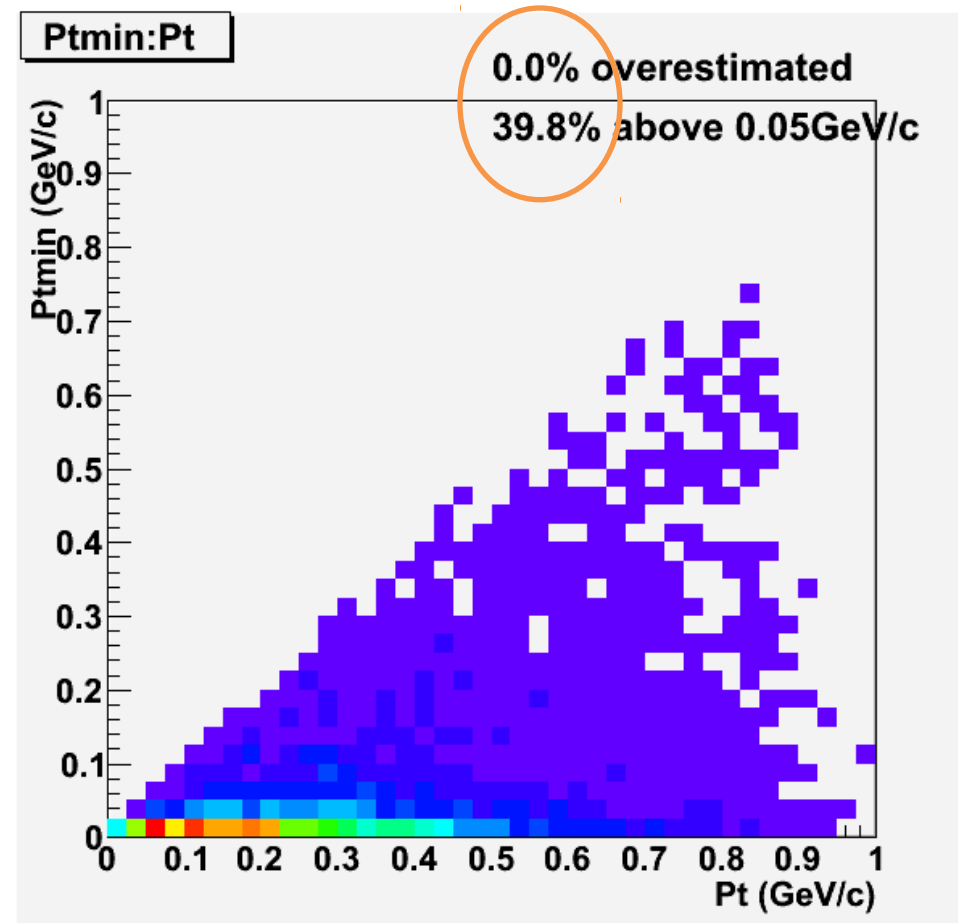
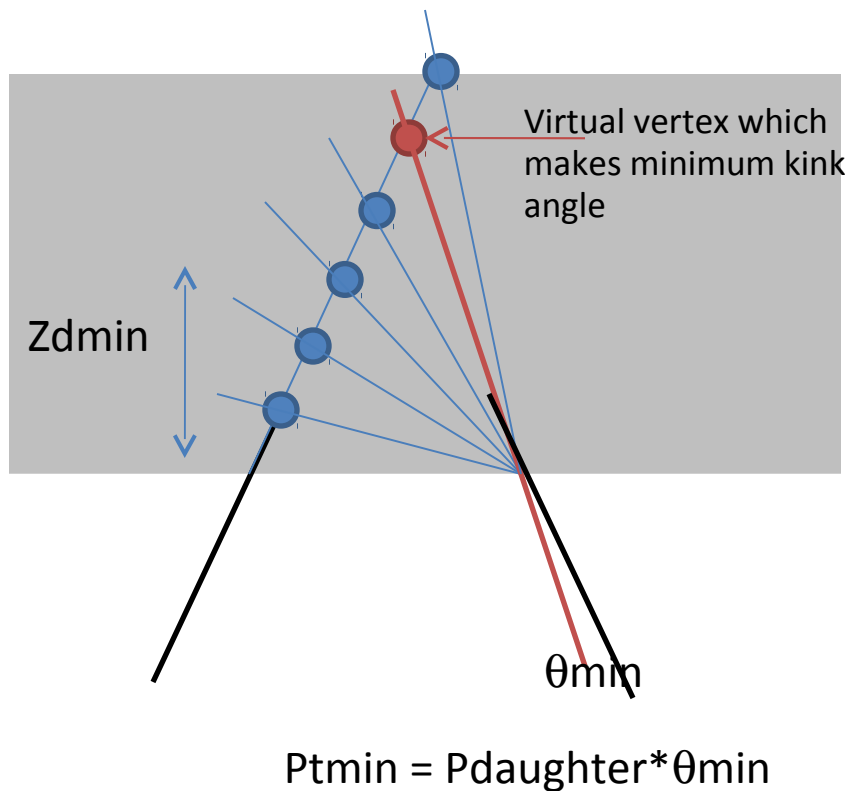


This is a rough estimation.
To be re-done using reconstructed
MC.

News from EWG meeting : 04/05/2011

Most reliable method.

Move a virtual vertex point along the partner track, find P_{tmin}



No overestimation and higher fraction above threshold.

Debugging session with Frank

Debug of many problems into Shower algo codes :
wrong number of plates processed, output tree
badly filled...

Investigation about overestimating energy

MC : 4 GeV → Reco : 5.1 GeV (38%)

→ Reco Frank : 4.1 GeV (34%)

Overestimation because of energy loss into the whole
1st plate instead of random thickness : 0.5 GeV

The remaining enhancement of Energy : MC differences
? → Frank shall process my MC samples :

Work session in Bern from 20th to 24th May

MC Sample - OpRelease 4.0

Samples of $\tau \rightarrow e$ DIS & QE produced by Elisabetta

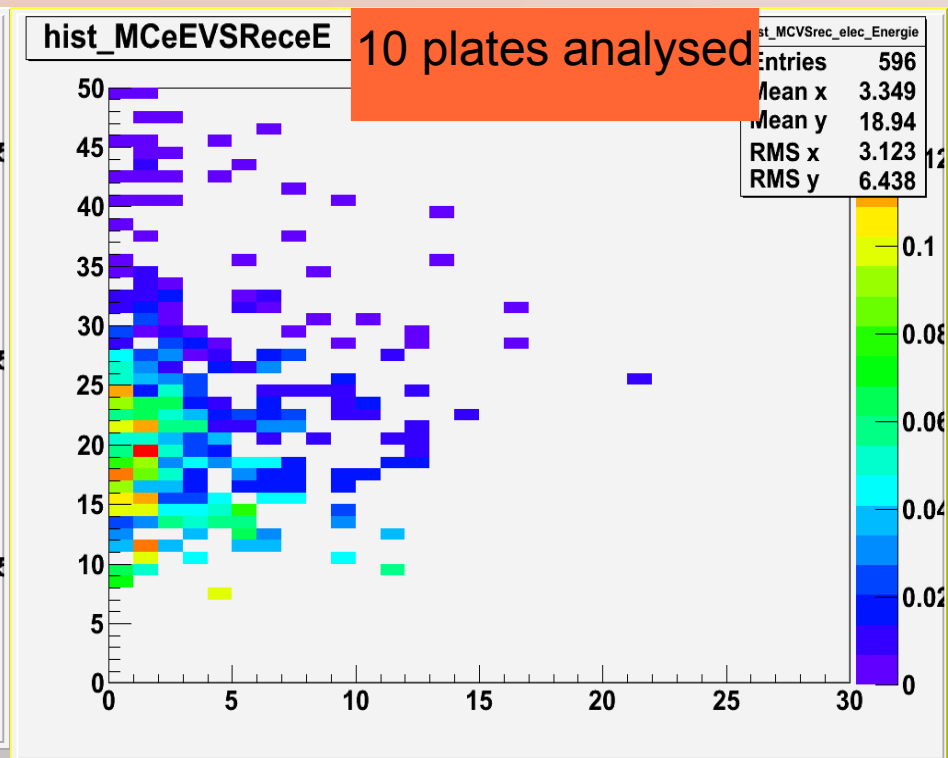
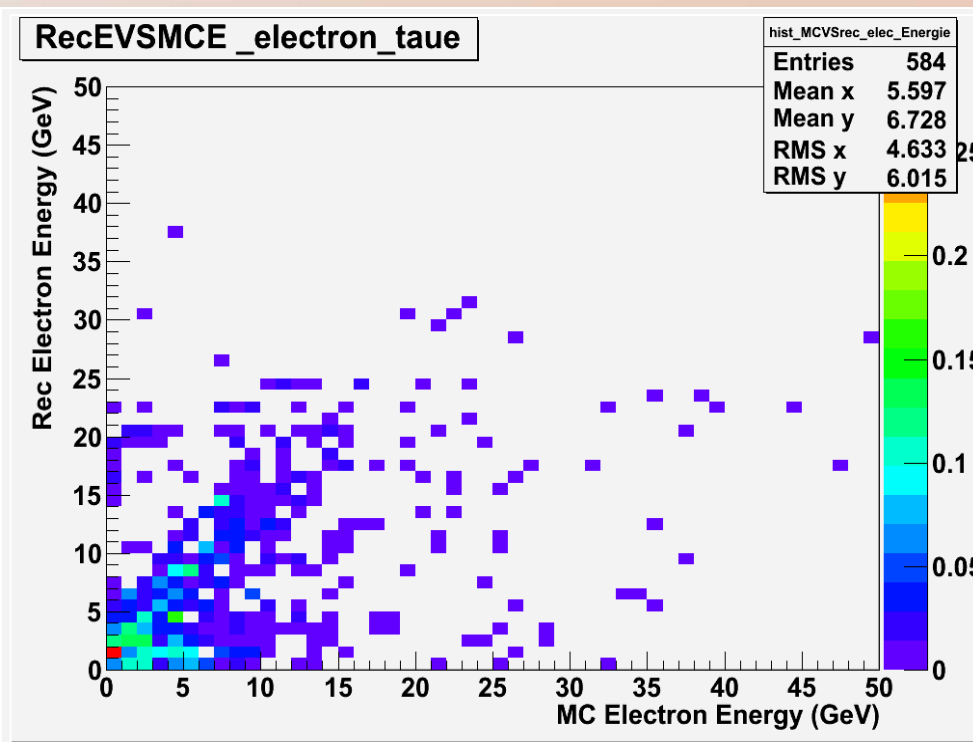
/sps/opera/operap/production/OpEmuIO/march2011/TAUE/DATA/tauef
oremu_tgt1000_OpR4.0_rec_11.root

- Processed through OpEmuIO
- Processed through OpEmuRec packages : CS, Scanback, Link, Alignment, Track & Shower **by using all plates available in the brick**
- All packages up to OpEmuRec Track are taken from the release \$GROUP_DIR/soft/OpRelease4.0_emulsion_march2011/
- OpEmuRec Shower is released here :
/sps/opera/scratch/flbrunet/analysis/OpRelease_2011-04-04_OKwithShower/4.0/OpEmuRec/

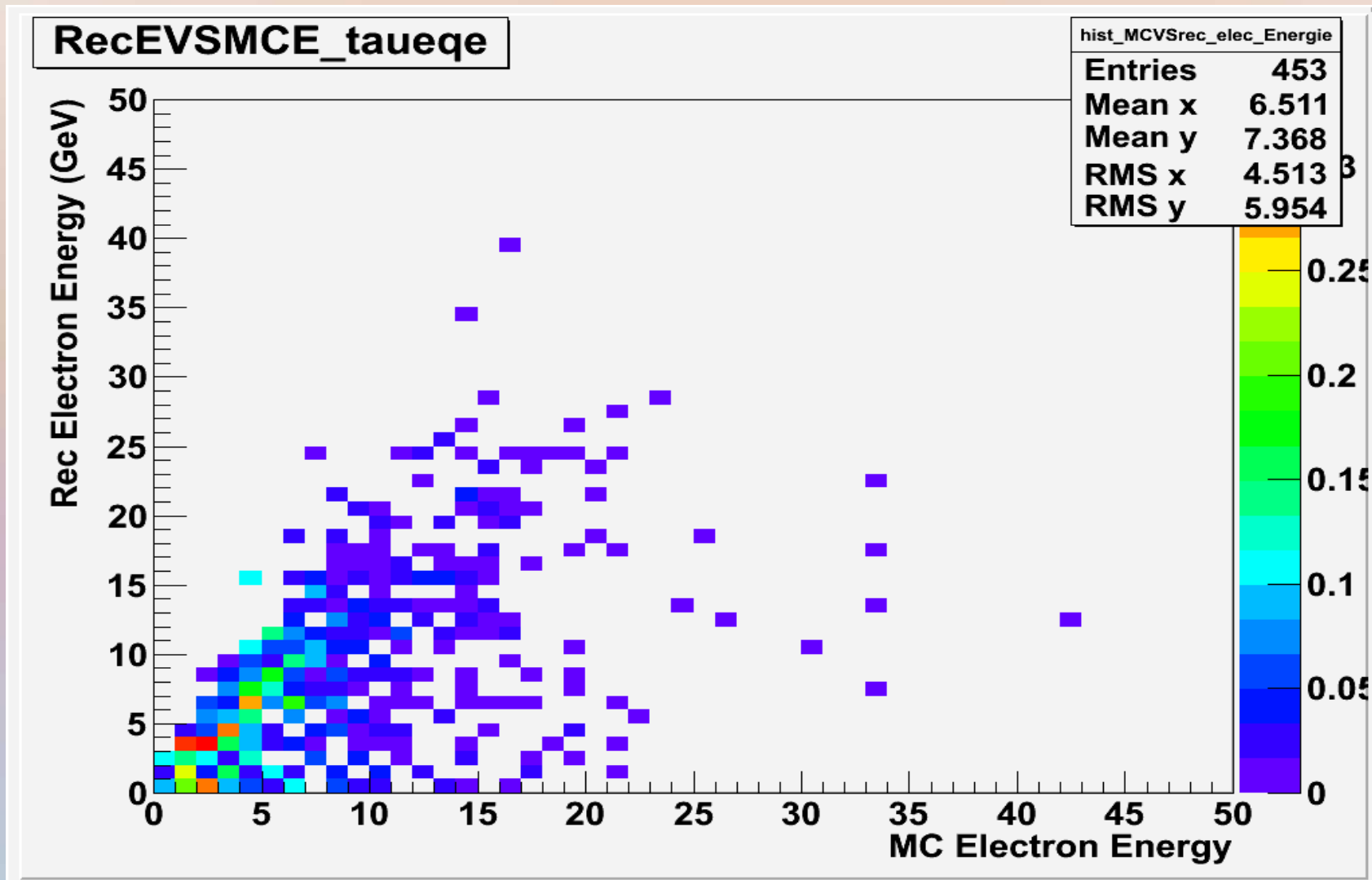
Umut	Surviving Brick Finding	Surviving CSLNGS	At least 1 CS track is connected and SB is ok	<i>Plate number < 55 location efficiency*</i>
<i>Umut : Tau-e DIS</i>	0.903	0.686	0.638	0.572
<i>Umut : Tau-e QE</i>	0.869	0.558	0.496	0.419

Florian	1 st brick found by Brick Finding is 111		At least one BT found in CS = CS-ECC connected	At least 1 BT as SB track & located in one plate < 55	At least one shower reconstructed
Tau-e DIS	0.677		0.638	0.530	0.516
<i>Tau-e QE</i>	0.630		0.496	0.385	0.365

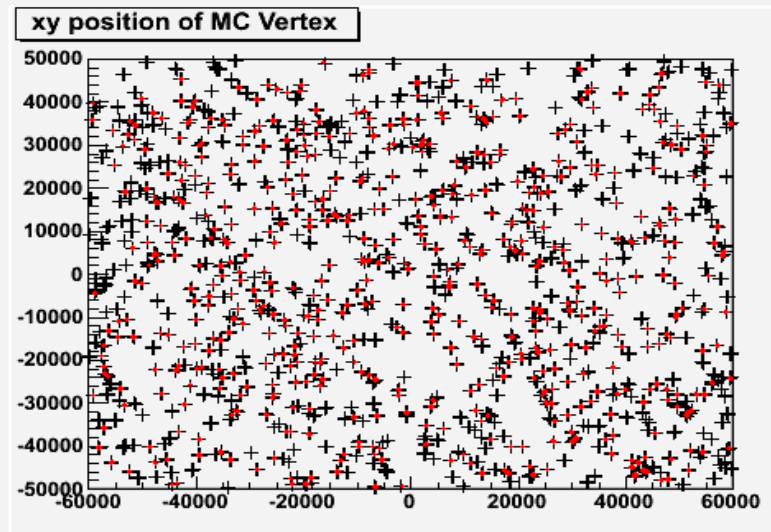
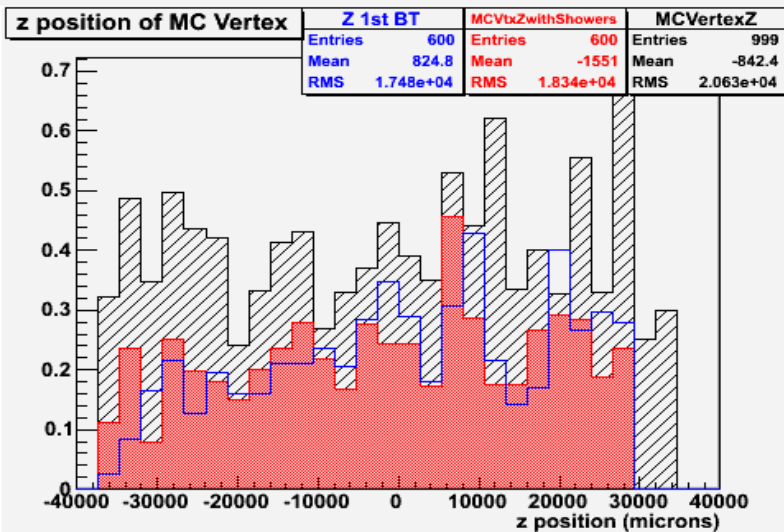
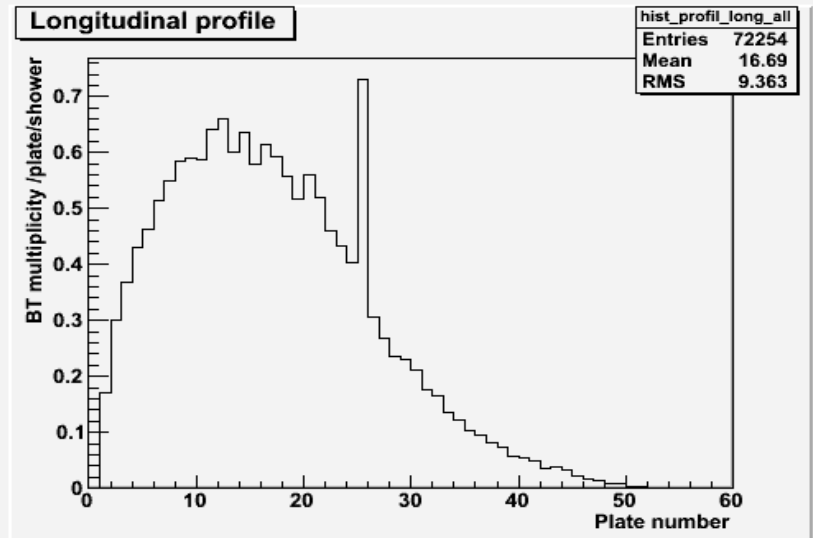
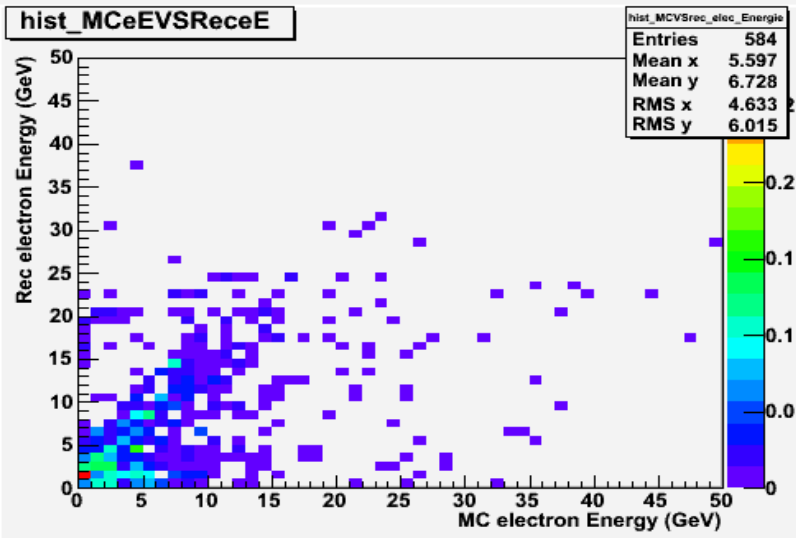
$\tau \rightarrow e$ DIS : Reconstructed electron energy VS MC electron energy



$\tau \rightarrow e$ DIS : Reconstructed electron energy VS MC electron energy

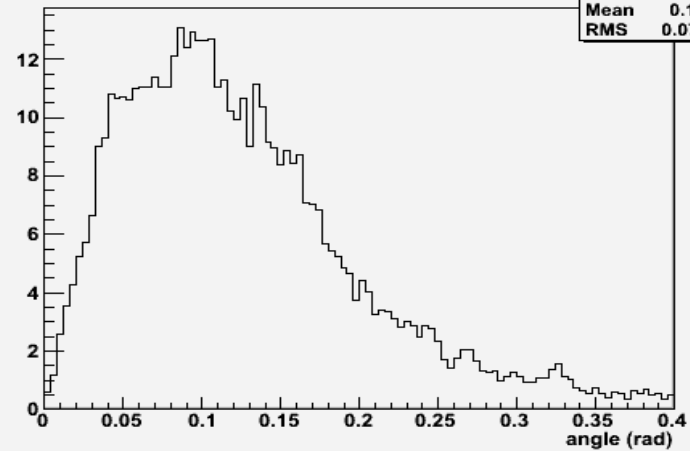


$\tau \rightarrow e$ DIS : standard plots

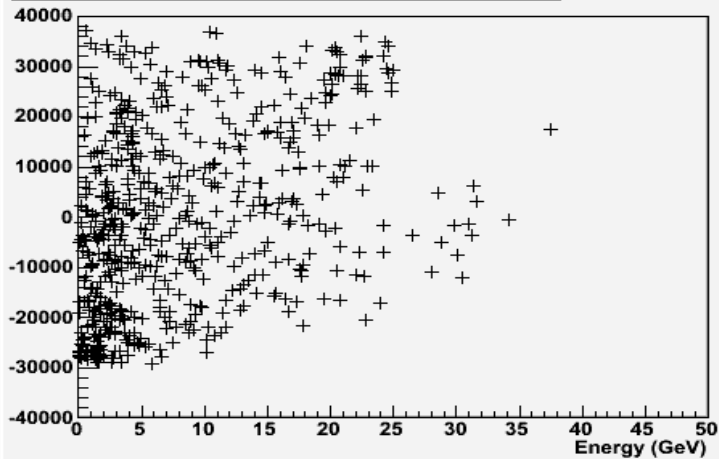


$\tau \rightarrow e$ DIS : standard plots (2)

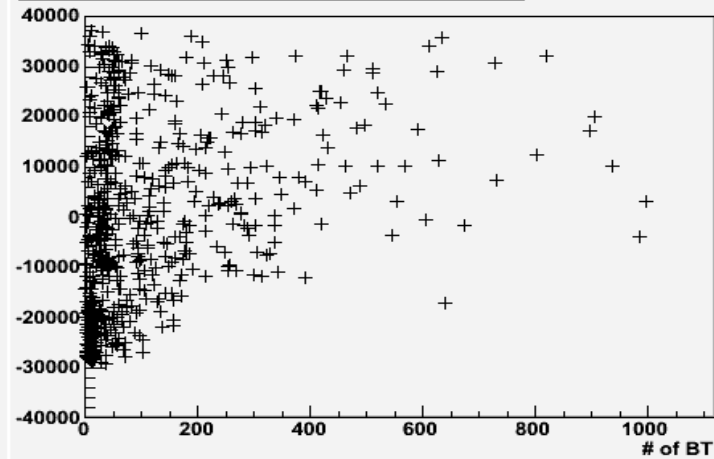
angle of BT



z position of 1st BT VS Rec Shower Energy

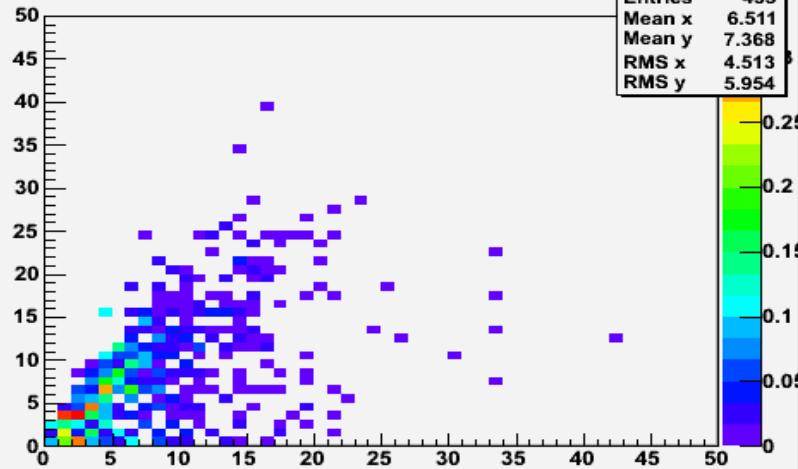


z position of 1st BT VS BT multiplicity

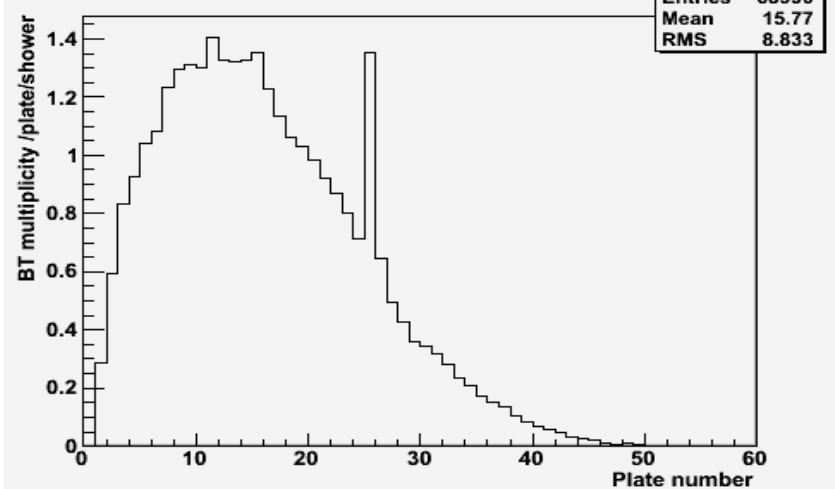


$\tau \rightarrow e$ QE : standard plots

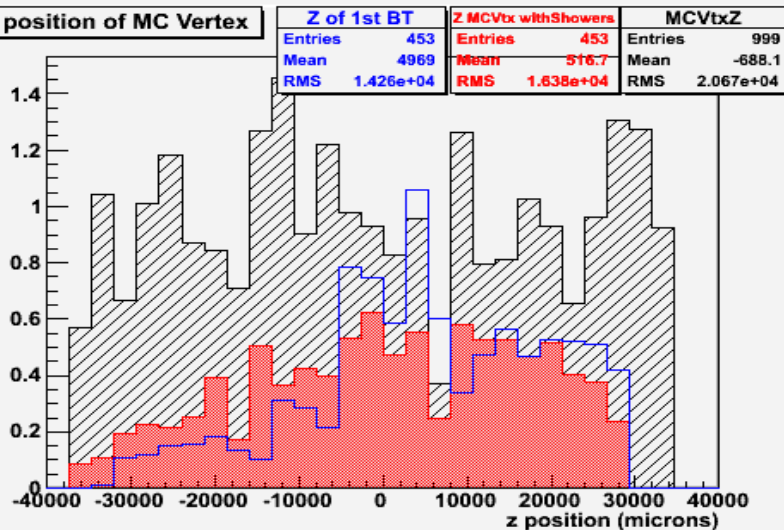
hist_MCeEVSReceE



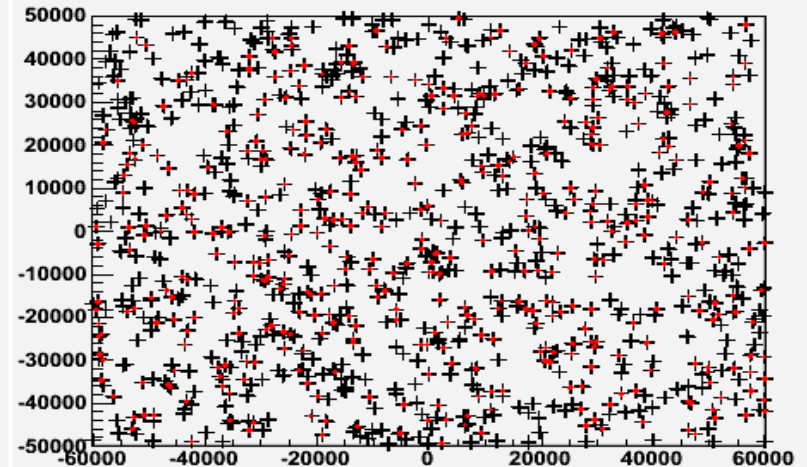
Longitudinal profile



z position of MC Vertex

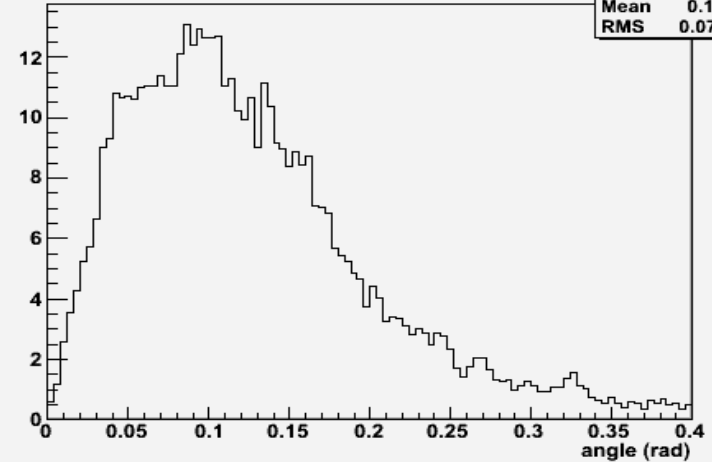


xy position of MC Vertex

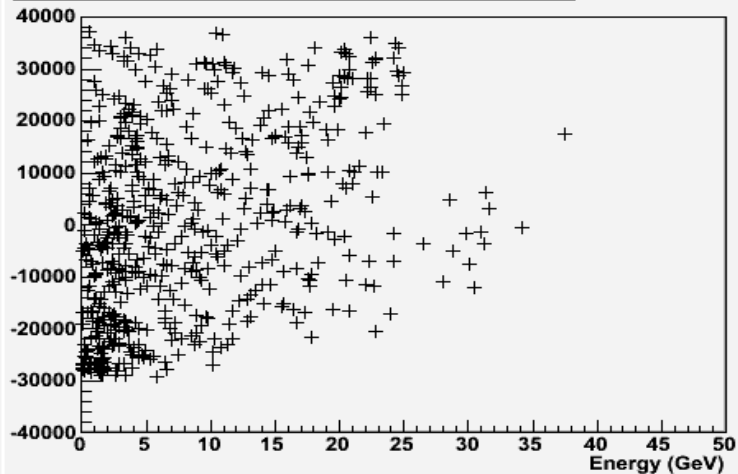


$\tau \rightarrow e$ QE : standard plots

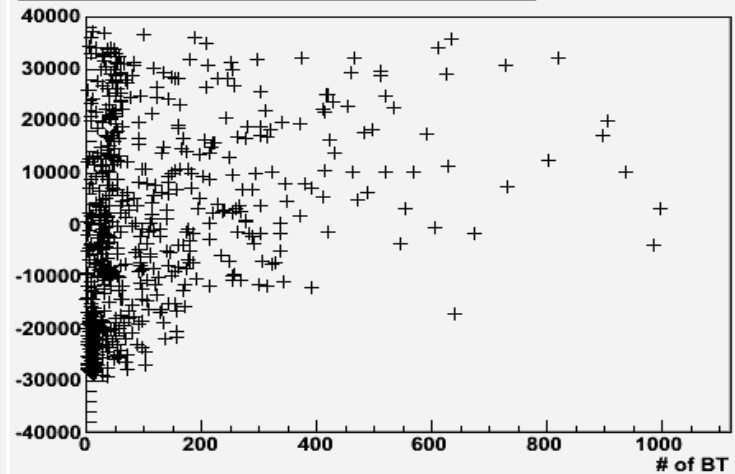
angle of BT



z position of 1st BT VS Rec Shower Energy



z position of 1st BT VS BT multiplicity



Outlook

Finish work session with Frank about discrepancy between Fedra standalone algorithm/OpEmuRec implemented algorithm + Decay search training:
20-24/05/11

Finish analysing 1000 events :

- Understand the « 25th plate » peak in longitudinal profile
- Final efficiency : **with Decay Search & kinematical selection**

Reconstruct showers of ν_e beam MC sample

Check energy range of reconstructed showers : comparison with low electron energies of 0mu data

BACKUP SLIDES

Summary of event location efficiencies

Sample	Efficiency of reconstructing a shower	Efficiency to see one shower in CS : 1 BT	Efficiency to see one shower in CS : 3 BT (Fabio)	Efficiency to see one shower in CS : 5 BT (Tiem)
313 $\tau \rightarrow e$ DIS	$87.4 \pm 2.0\%$	$41.4 \pm 4.6\%$	$18.0 \pm 5.4\%$	$14.4 \pm 5.5\%$
1000 $\tau \rightarrow e$ QE	$85.8 \pm 1.2\%$	$51.1 \pm 2.4\%$	$41.8 \pm 2.6\%$	$35.5 \pm 2.8\%$