Réunion OPERA

03/05/11 - Florian Brunet

Outline

News from EWG meeting : 19/04/2011
Debugging session with Frank
Implementation of shower algo into OpRelease
Test on “1000 $\tau \rightarrow e$ DIS & QE” samples
Outlook

Number of events: 553 nueDIS and 526 numuNC

	Ntrk>=4 dr<2500	Ntrk>=5, dr<2500		BG, Ntrk>=4 dr<2500	BG, Ntrk>=5 dr<2500	
2mm150mrad	409(350)	381(328)	0.74/0.69	46	38	0.09/0.07
2mm250mrad	430(369)	407(352)	0.78/0.74	55	43	0.10/0.08
3mm150mrad	417(351)	385(327)	0.75/0.70	54	44	0.10/0.08
3mm250mrad	444(370)	425(357)	0.80/0.77	65	54	0.12/0.10
4mm150mrad	420(350)	390(329)	0.76/0.71	59	48	0.11/0.09
4mm250mrad	446(369)	429(357)	0.81/0.78	73	59	0.14/0.11
5mm150mrad	423(351)	395(331)	0.77/0.71	67	52	0.13/0.10
5mm250mrad	449(369)	432(357)	0.81/0.78	81	69	0.15/0.13

1ry electron is closest one. The cluster which contains maximum number of tracks is selected. For some events both 1ry electron and hadron are close, minimum one is selected.

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 : 0.5GeV

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

OpRelease 4.0

Implementation of electromagnetic shower reconstruction algorithm in OpRelease 4.0 : DONE

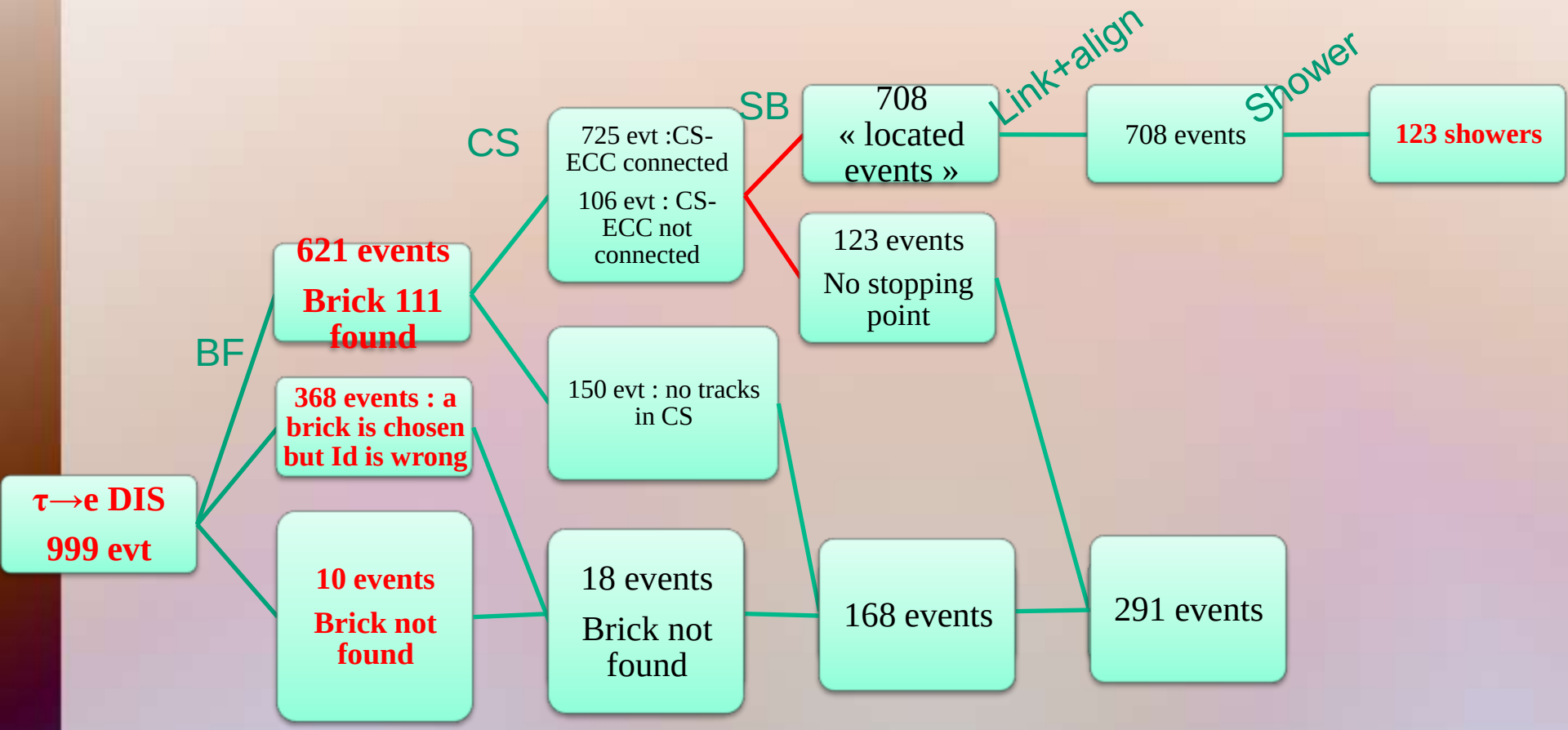
Here you can find :

/sps/opera/scratch/flbrunet/analysis/OpRelease_2011-04-04_OKwithShower

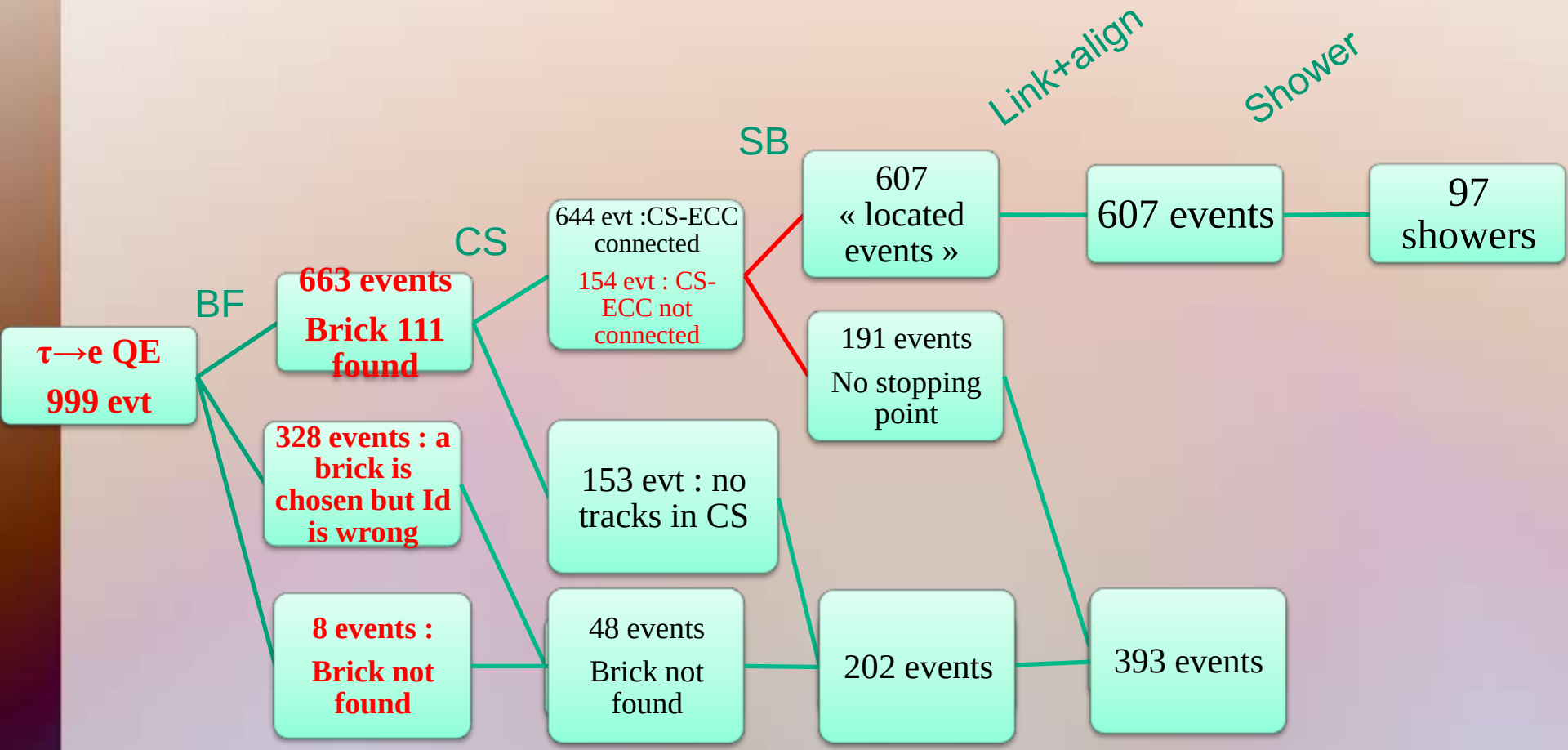
Note that you need Fedra standard output from linking which are automatically produced by *OpRelease4.0_emulsion_march2011*

Test of this last implementation with new production : 1000 events $\tau \rightarrow e$ DIS & QE

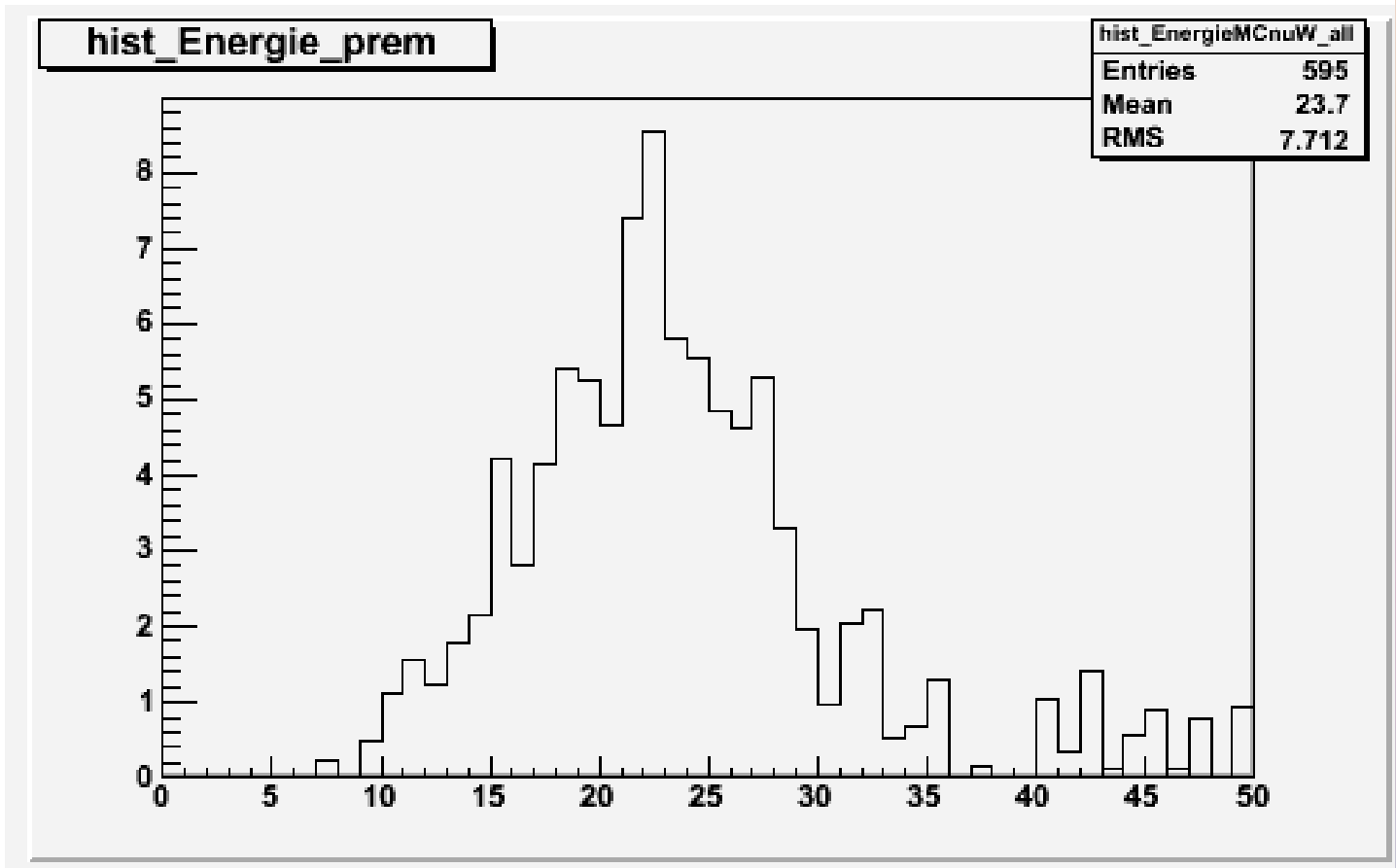
Reconstruction chain : « 1000 τ→e DIS » sample



Reconstruction chain : « 1000 τ→e QE » sample

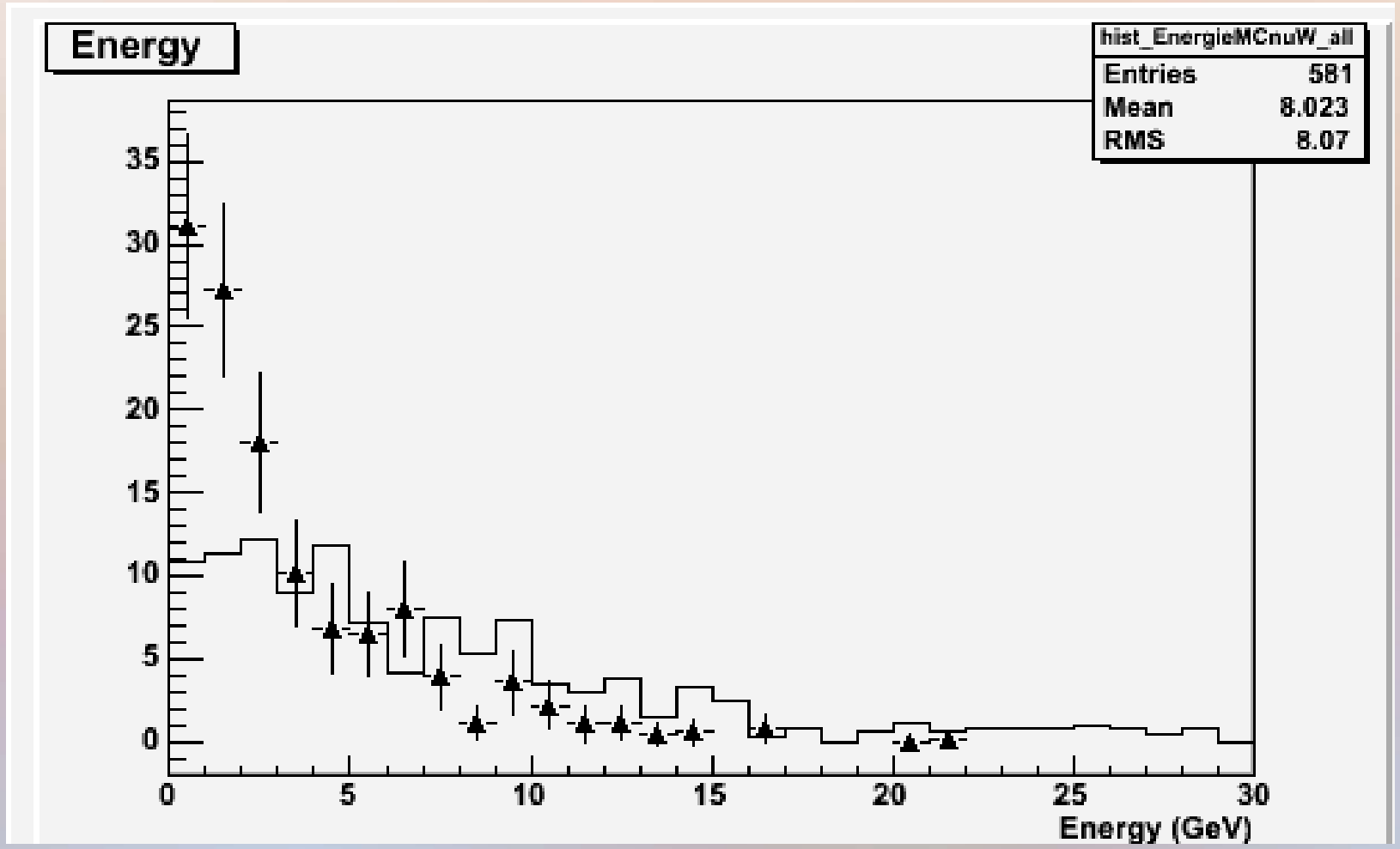


τ→e DIS : MC ν-Energy std + MC ν-Energy selected events



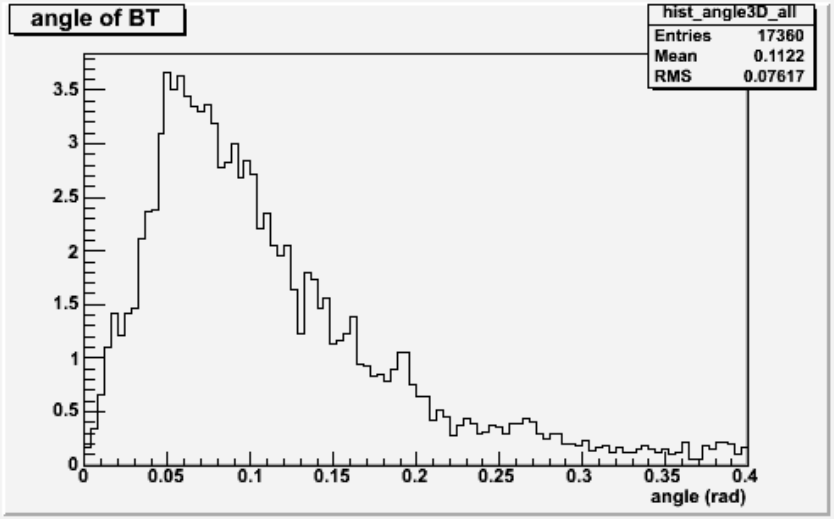
τ→e QE : MC ν-Energy std + MC ν-Energy selected events

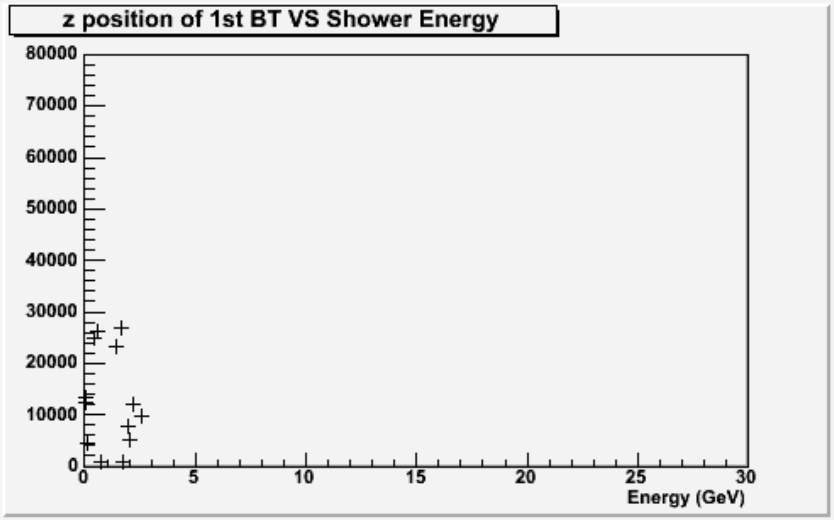
τ→e DIS : MC e-Energy + reconstructed electron energy

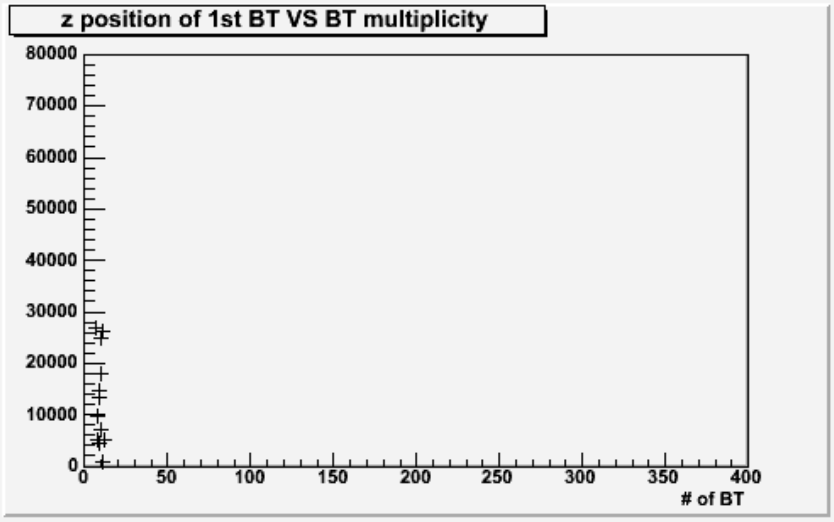


τ→e QE : MC e-Energy + reconstructed electron energy

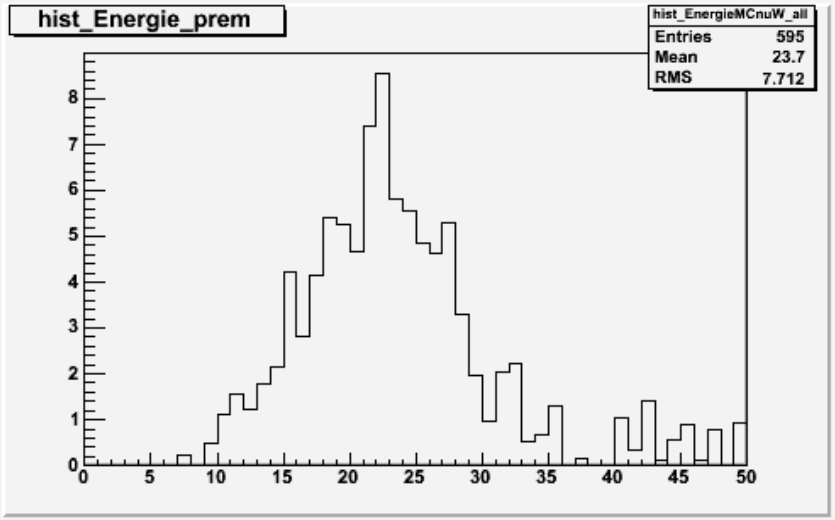
τ→e DIS : standard plots

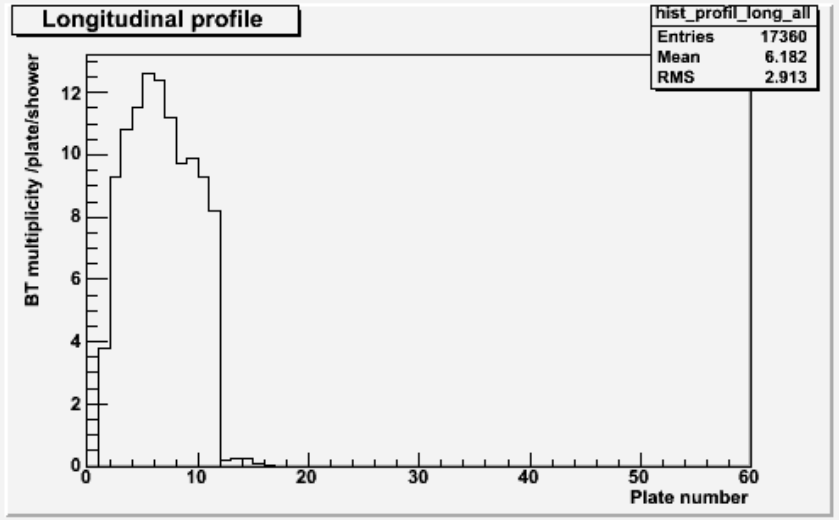


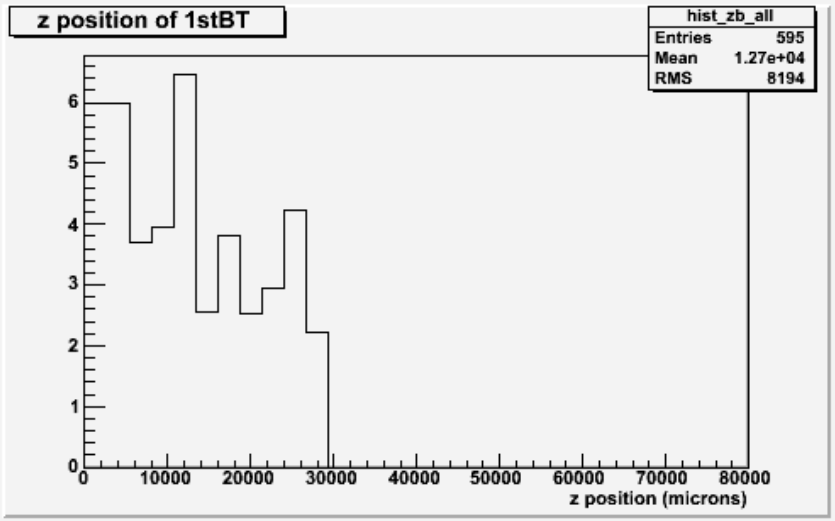


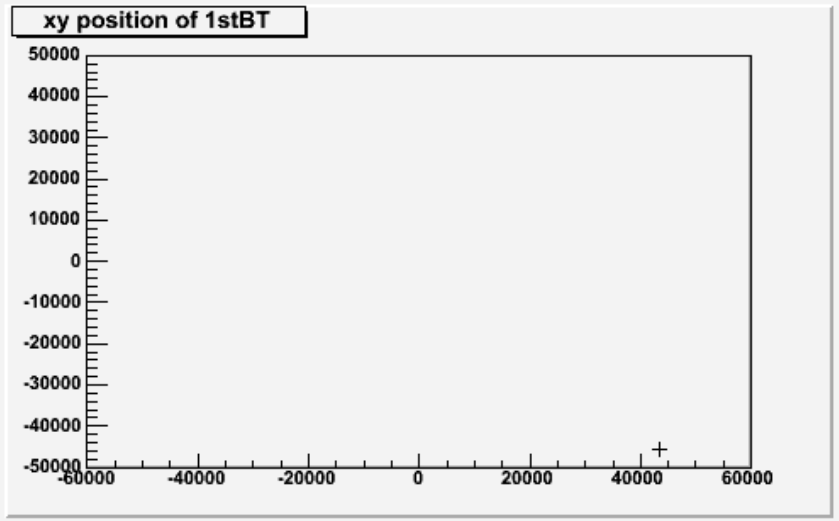


τ→e DIS : standard plots









Outlook

Finish work session with Frank about discrepancy between Fedra standalone algorithm/OpEmuRec implemented algorithm : 9-10/04/11

Finish analysing 1000 events :

check showers with CS predictions

check showers with CS pred + SB pred

➔ Final efficiency : **w/o Decay Search**

check steps and (in)compatibility with Umut results

Reconstruct showers of νe beam MC sample

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

BACKUP SLIDES

	Surviving Brick Finding	Surviving CSLNGS	*At least 1 CS track is connected and SB is ok*	*Plate number < 55 location efficiency**
Numu-CC	***0.956***	***0.786***	***0.744***	***0.705***
Numu-NC	***0.776***	***0.518***	***0.463***	***0.438***
Tau-e DIS	***0.903***	***0.686***	***0.638***	***0.572***
Tau-e QE	***0.869***	***0.558***	***0.496***	***0.419***
Nue DIS			***0.694***	***0.665***
Nue QE	***0.888***	***0.784***	***0.664***	***0.632***

Data sample:

/sps/opera/operap/production/OpEmuIO/march2011/INTER_TYPE/DATA

and for nueDIS / nueQE

/sps/opera/scratch/ukose/OpRelease4.0_emulsion_march2011/4.0/OpEmuIO/v3/work/PRODUCTION/

Summary of event location efficiencies

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