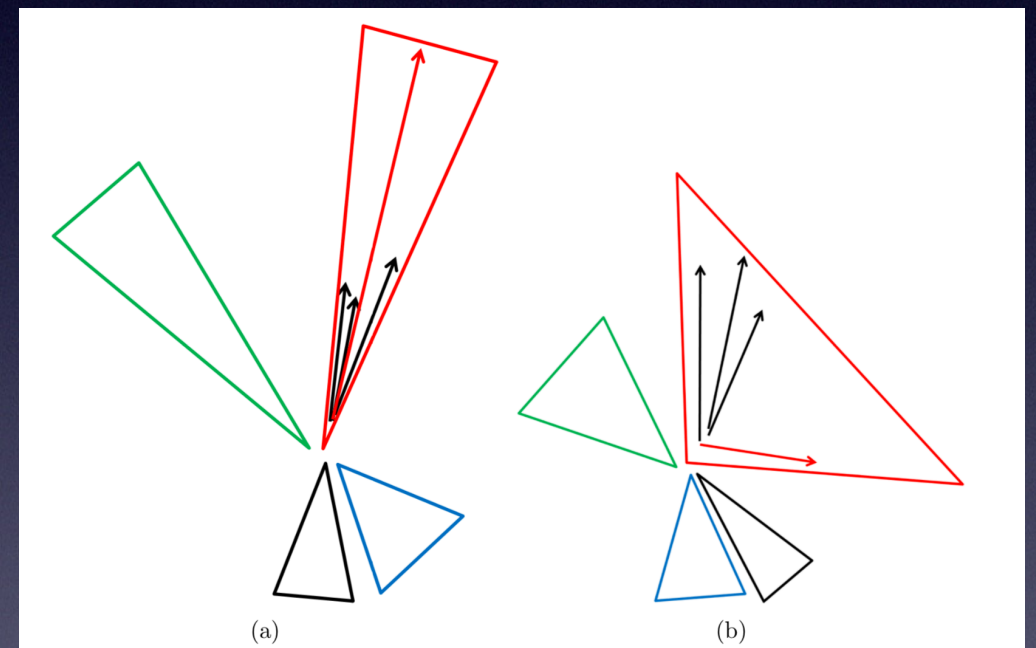


Vertex Charge Measurement

Y. Okugawa, R. Yonamine, R. Pöschl

TTbar Analysis with ILCsoft v02-00-01

- Switching jet clustering processor from SatoruJetFinder to FastJetProcessor.
- Current *LAL LeptonFinder* processes “Durham” algorithm while it is not available in FastJetProcessor. (kt-algorithm is used instead)



(Rou  n  , 2014)

Cut Criteria

- Lepton cut: $\text{Iso.Lep} > 5 \text{ GeV}$
- Hadronic Mass cut: $180 < M_{\text{Had}} < 420$
- $\text{btag1} > 0.8$ or $\text{btag2} > 0.3$
- Thrust: $\text{thrust} < 0.9$
- Top1 mass: $120 < m_{t1} < 270$
- W1 mass: $50 < m_{w1} < 250$

【ILCsoft v01-17-11】

===== Baseline Cuts =====

nEvents	= 85056 (100%)	
after lepton cuts	= 73277 (86.1515%)	↪ -7%
after btag cuts (0.8 & 0.3)	= 67842 (79.7616%)	
after thrust cut	= 67842 (79.7616%)	
after hadronic mass cut	= 66254 (77.8946%)	↪ -6%
after reco T & W mass cut	= 60880 (71.5764%)	

===== Non-baseline Cuts =====

after gcut	= 50634 (59.5302%)
after pcut	= 30009 (35.2815%)

recoforward = 15588

recobackward = 7718

Afb gen: 0.329718 N: 164292

Afb reco: 0.337681 N: 23306(102.415%)

Final efficiency: 28.3714%

【ILCsoft v02-00-01】

===== Baseline Cuts =====

nEvents	= 73579 (100%)	
after lepton cuts	= 61372 (83.4097%)	↪ -11%
after btag cuts (0.8 & 0.3)	= 53605 (72.8537%)	
after thrust cut	= 53605 (72.8537%)	
after hadronic mass cut	= 50830 (69.0822%)	↪ -10%
after reco T & W mass cut	= 43555 (59.1949%)	

===== Non-baseline Cuts =====

after gcut	= 34985 (47.5475%)
after pcut	= 24324 (33.0583%)

recoforward = 12170

recobackward = 6032

Afb gen: 0.330374 N: 142148

Afb reco: 0.337216 N: 18202(102.071%)

Final efficiency: 25.6099%

【ILCsoft v02-00-01】

===== Baseline Cuts =====

nEvents	= 73579 (100%)	
after lepton cuts	= 61372 (83.4097%)	
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===== Non-baseline Cuts =====

after gcut	= 34985 (47.5475%)
after pcut	= 24324 (33.0583%)

recoforward = 12170

recobackward = 6032

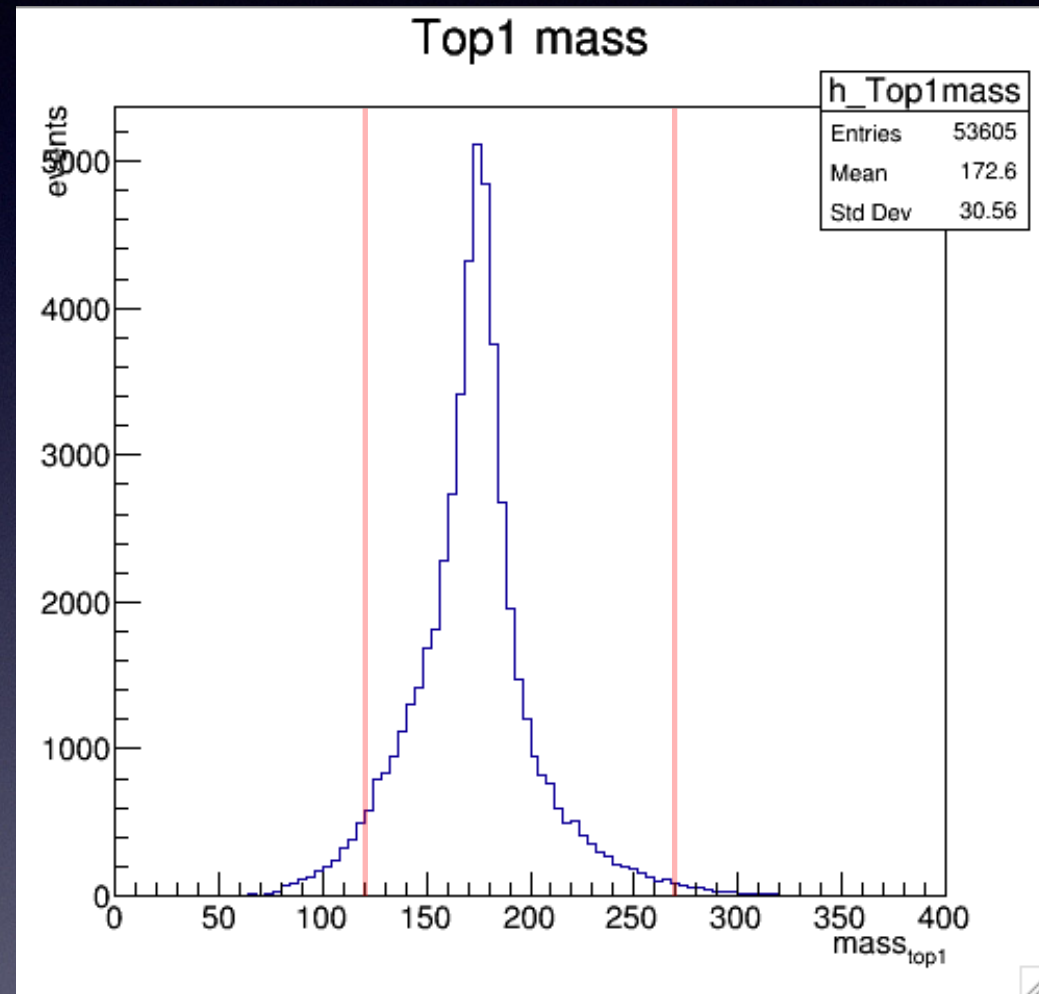
Afb gen: 0.330374 N: 142148

Afb reco: 0.337216 N: 18202(102.071%)

Final efficiency: 25.6099%

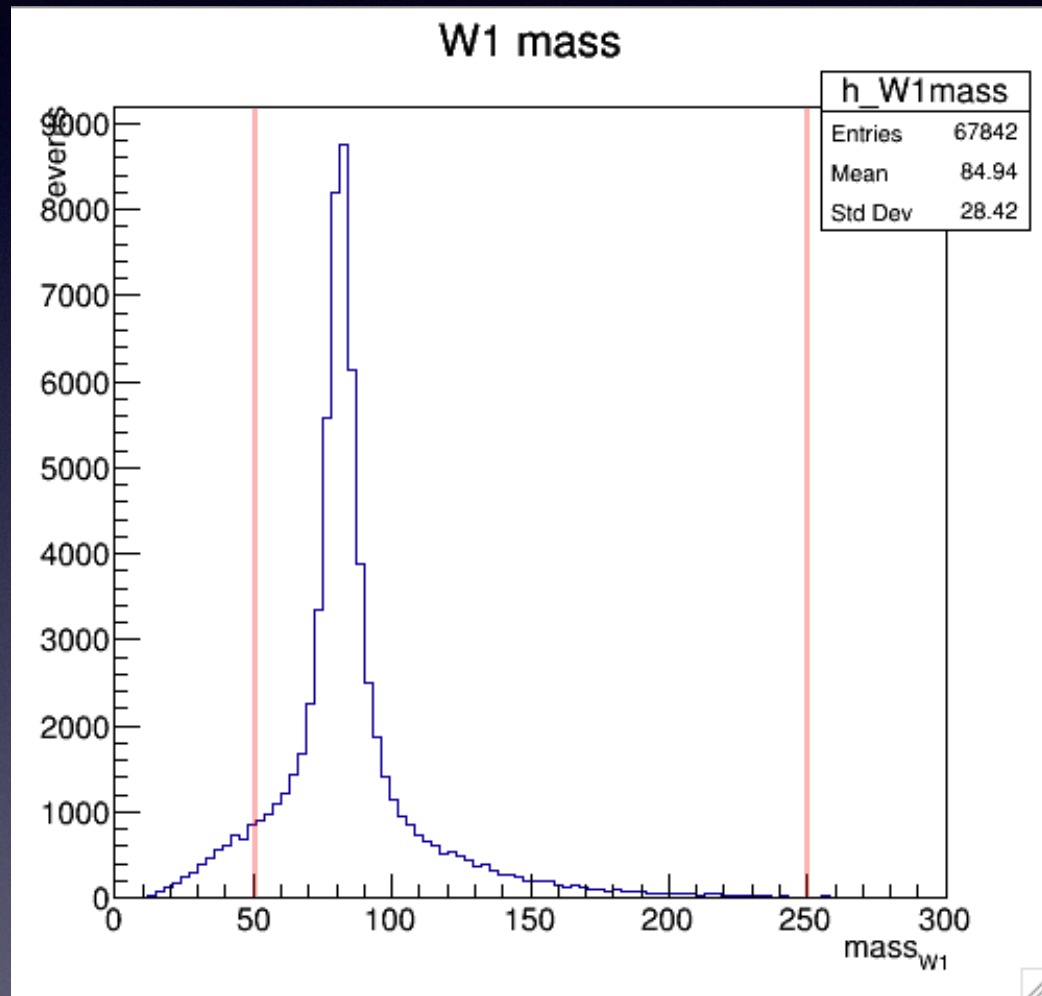
Top mass distribution

[ILCsoft v02-00-01]

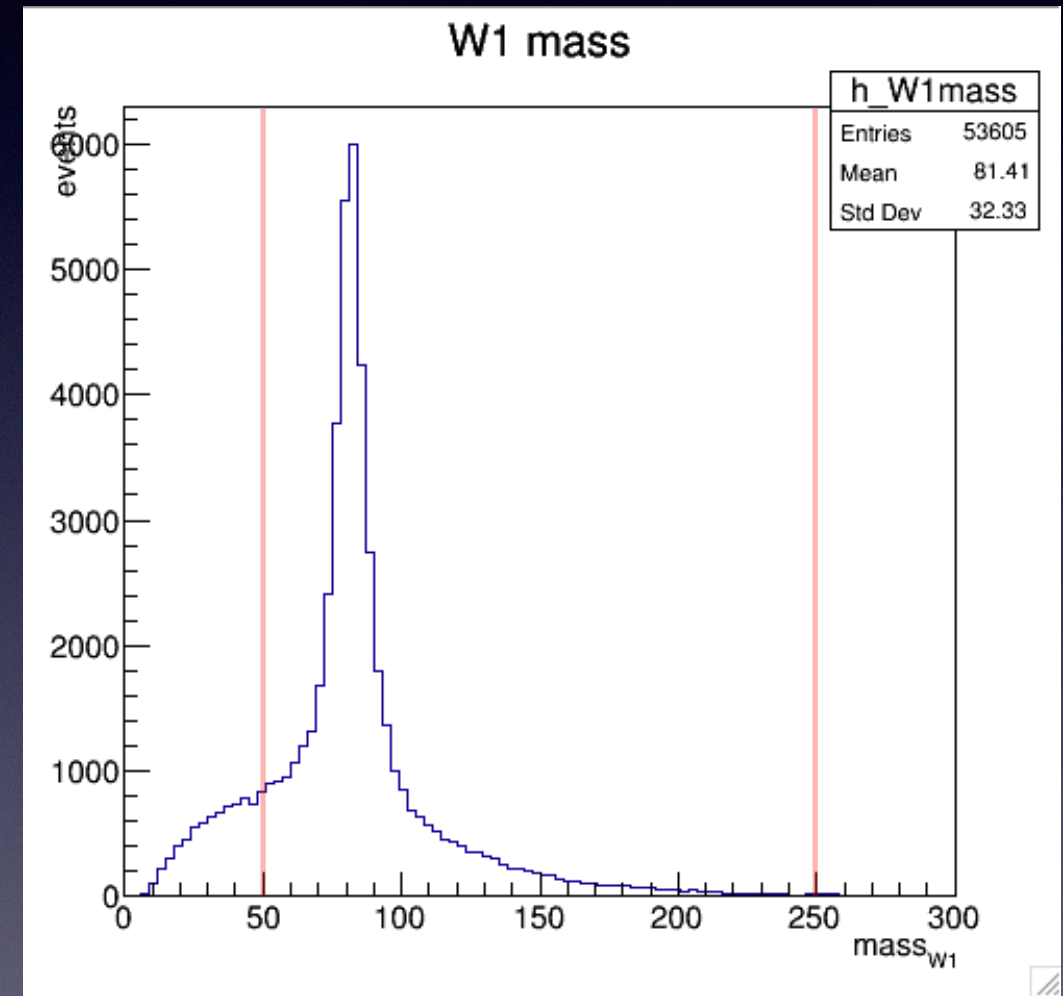


W mass distribution

【ILCsoft v01-17-11】

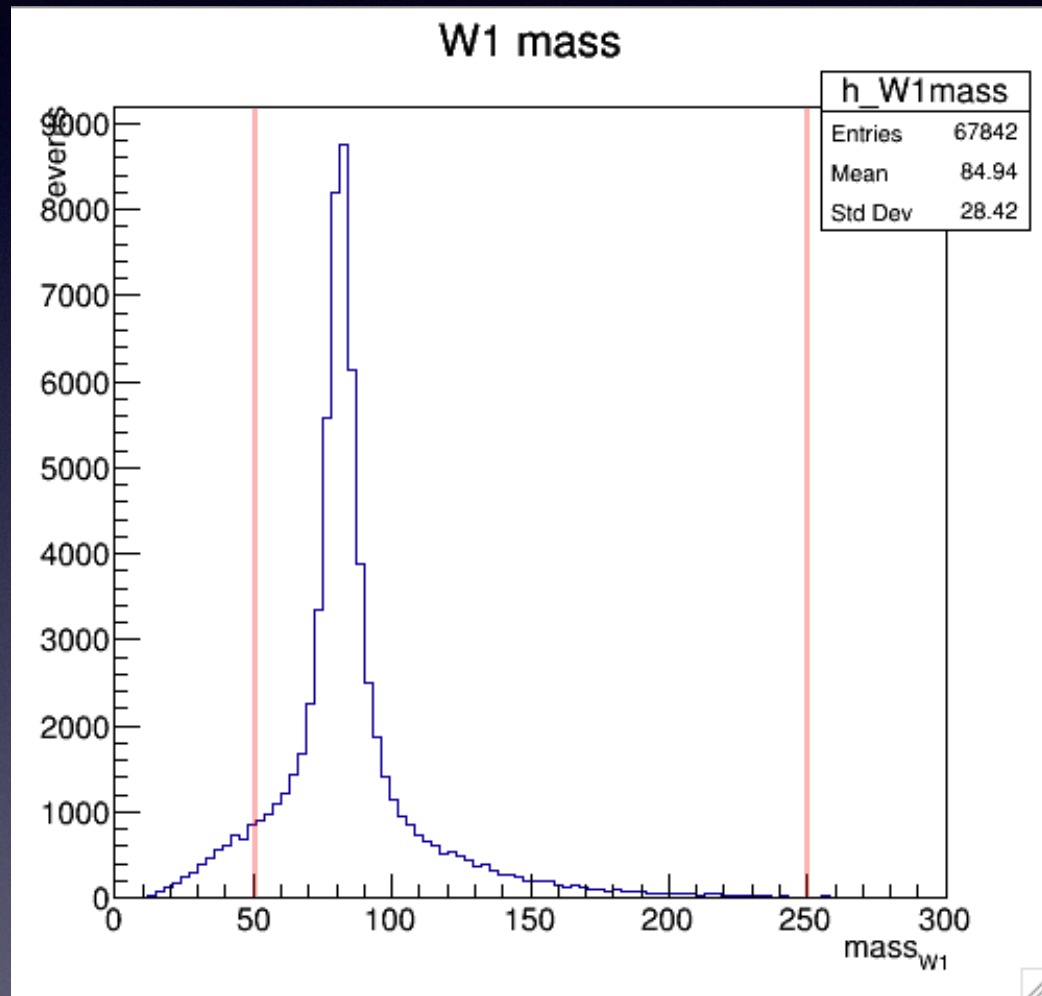


【ILCsoft v02-00-01】

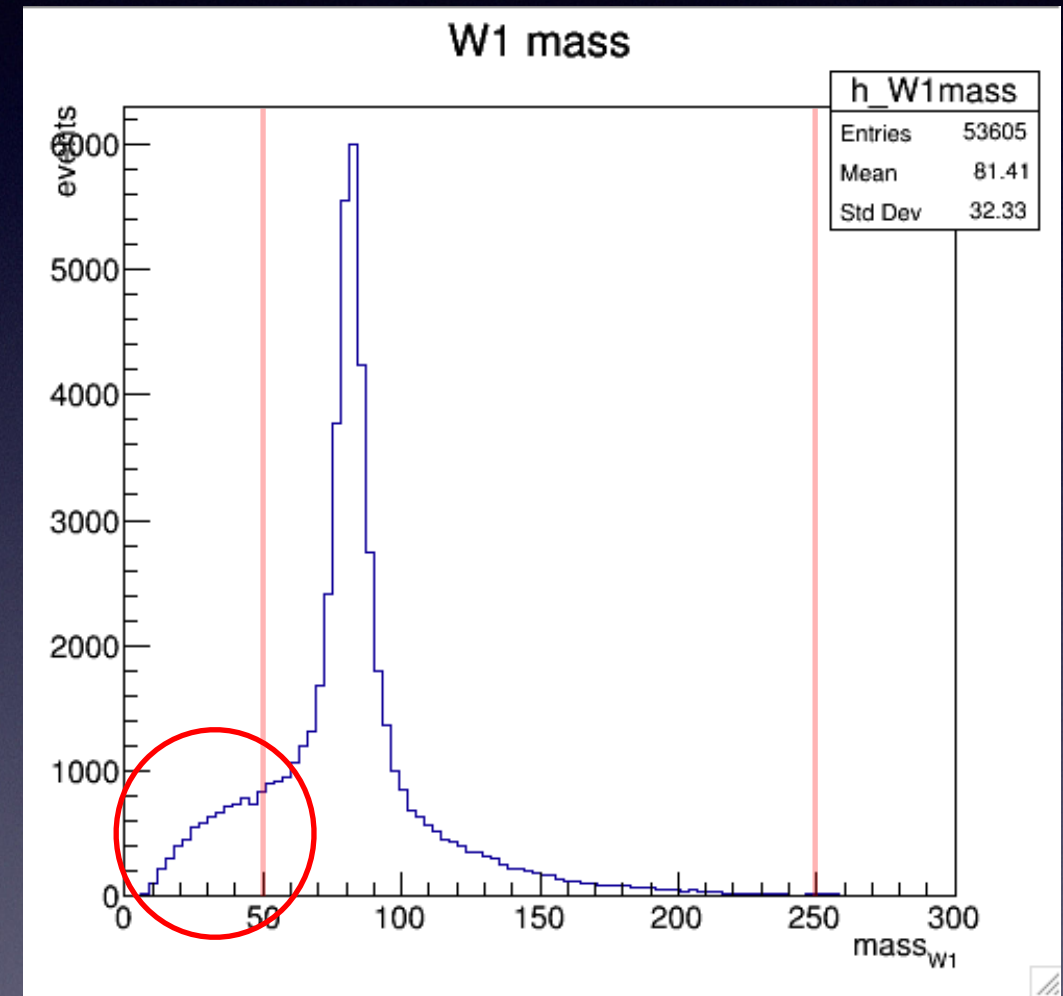


W mass distribution

【ILCsoft v01-17-11】



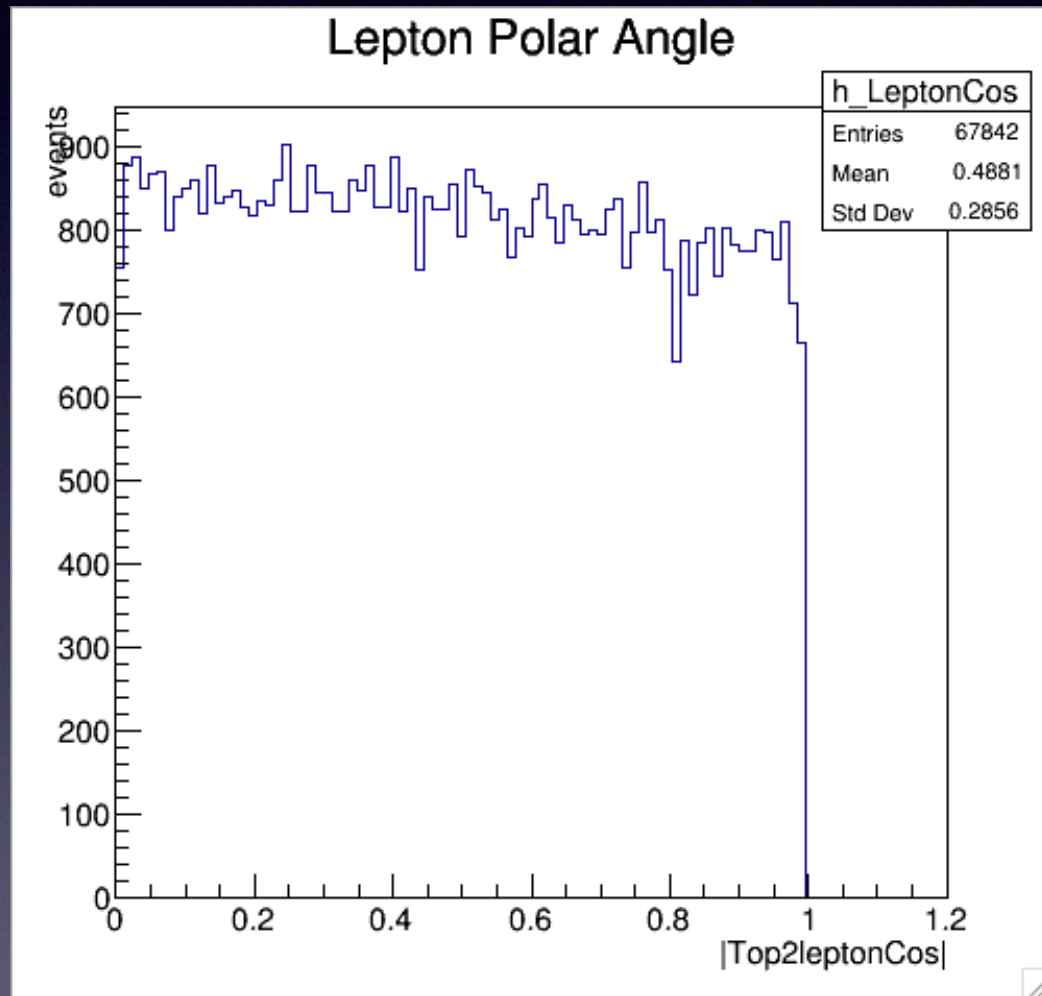
【ILCsoft v02-00-01】



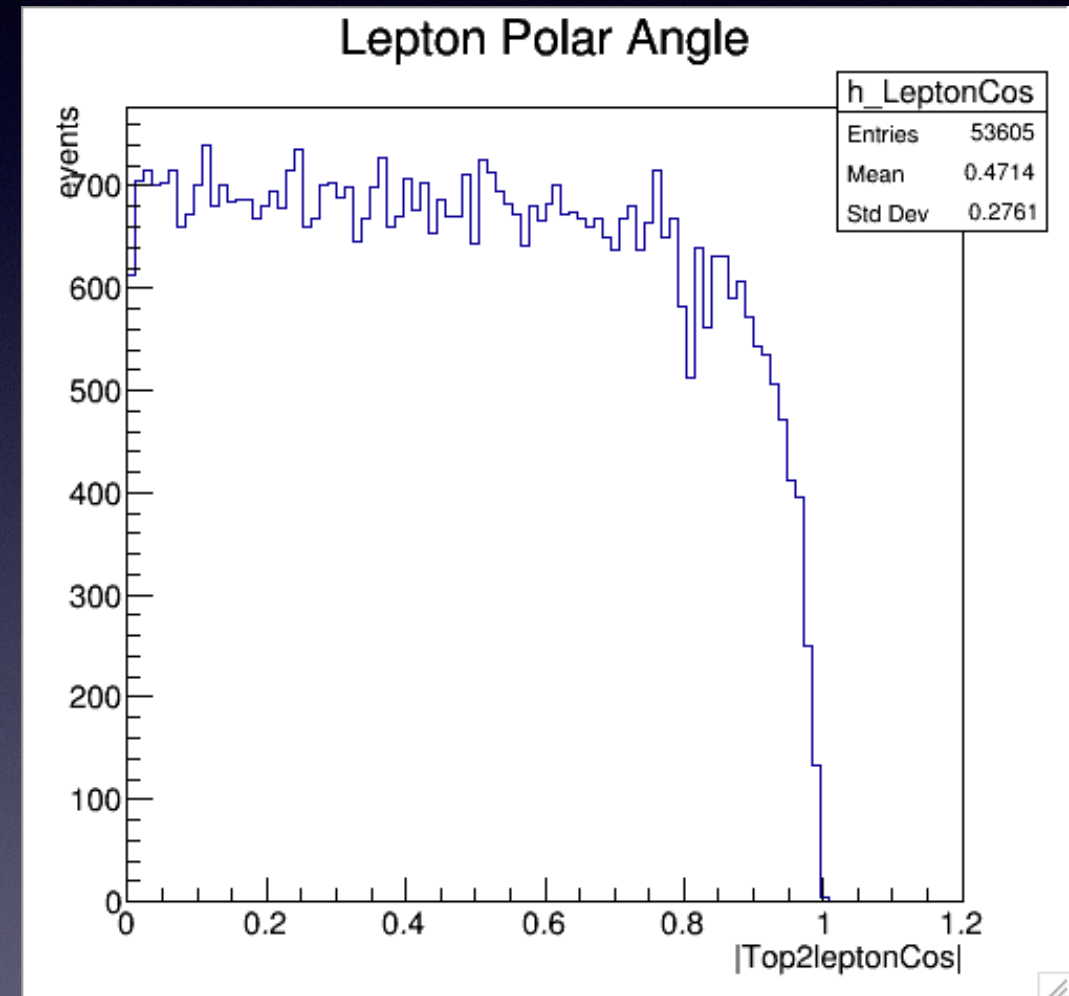
Possible misidentification of isolated leptons

Lepton Polar Angle

【ILCsoft v01-17-11】

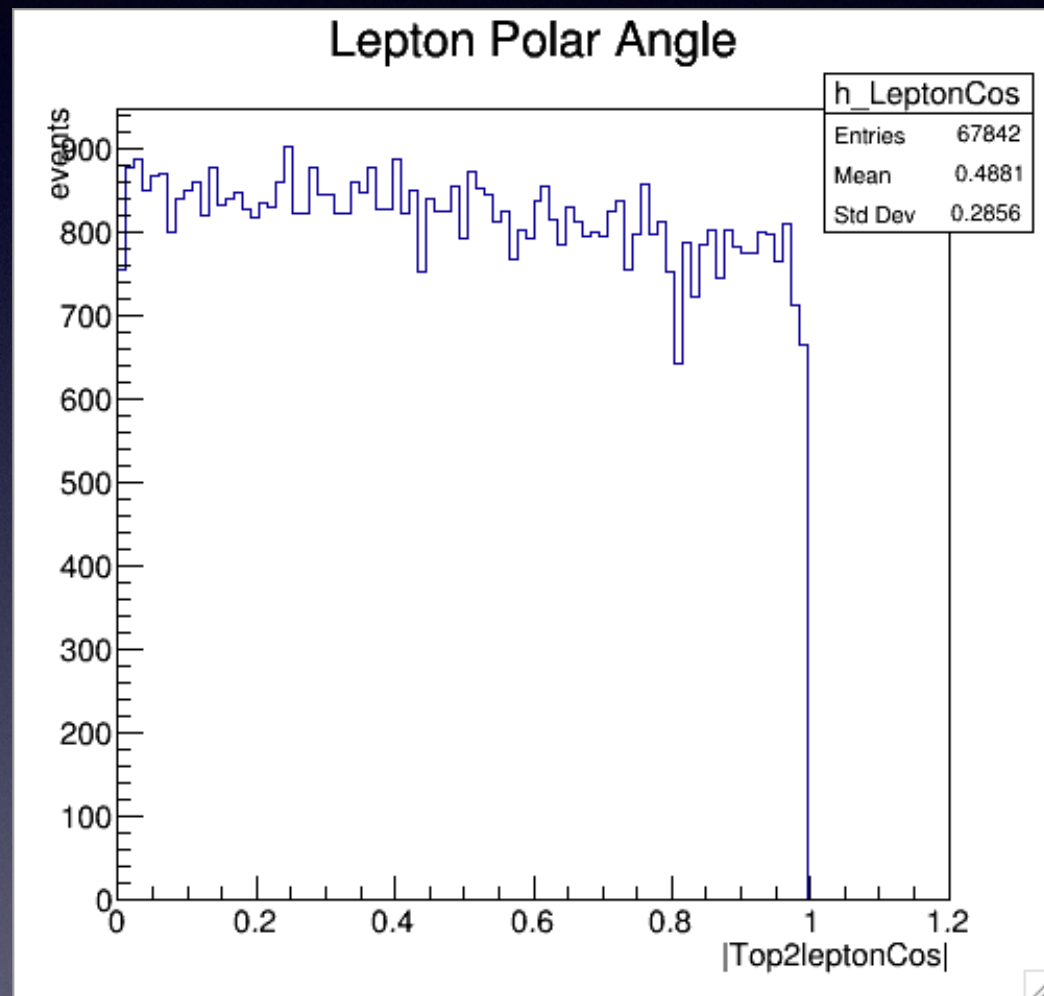


【ILCsoft v02-00-01】

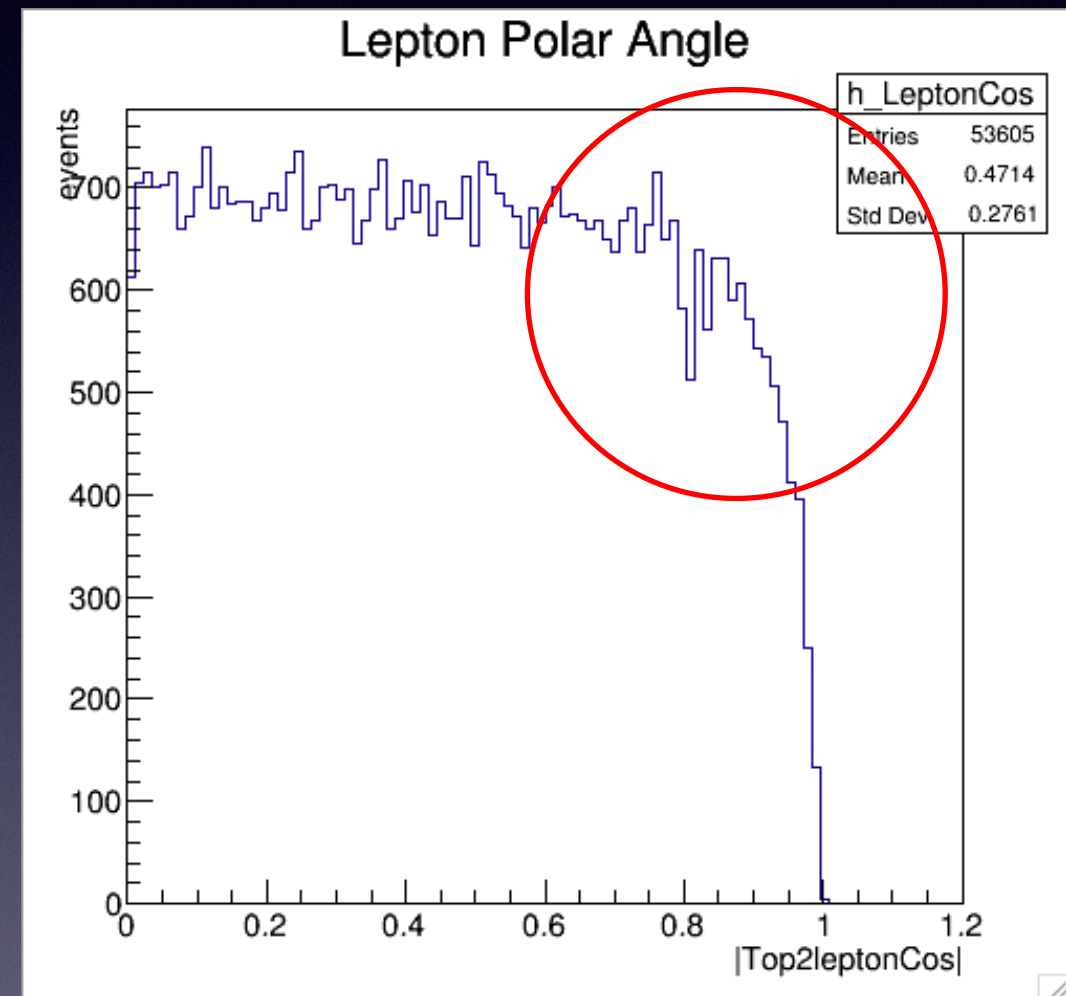


Lepton Polar Angle

【ILCsoft v01-17-11】



【ILCsoft v02-00-01】

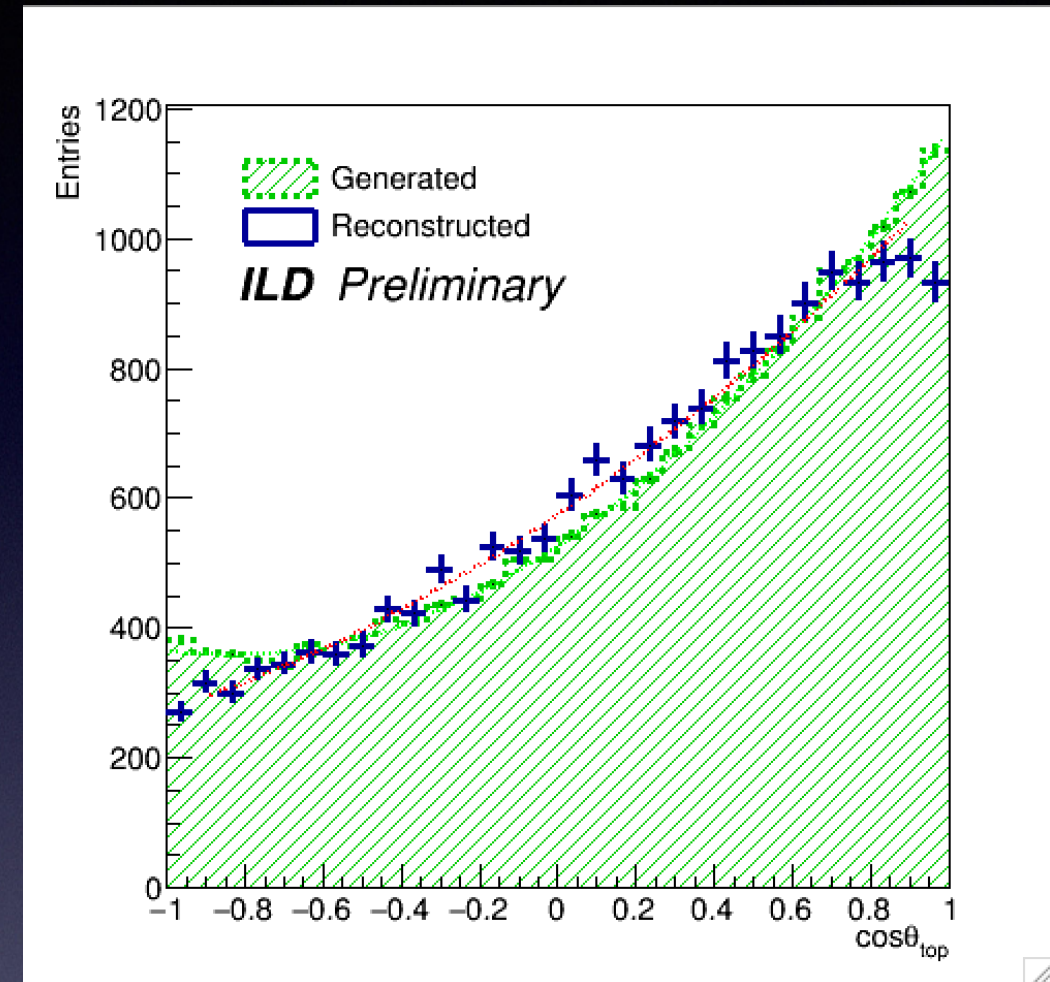
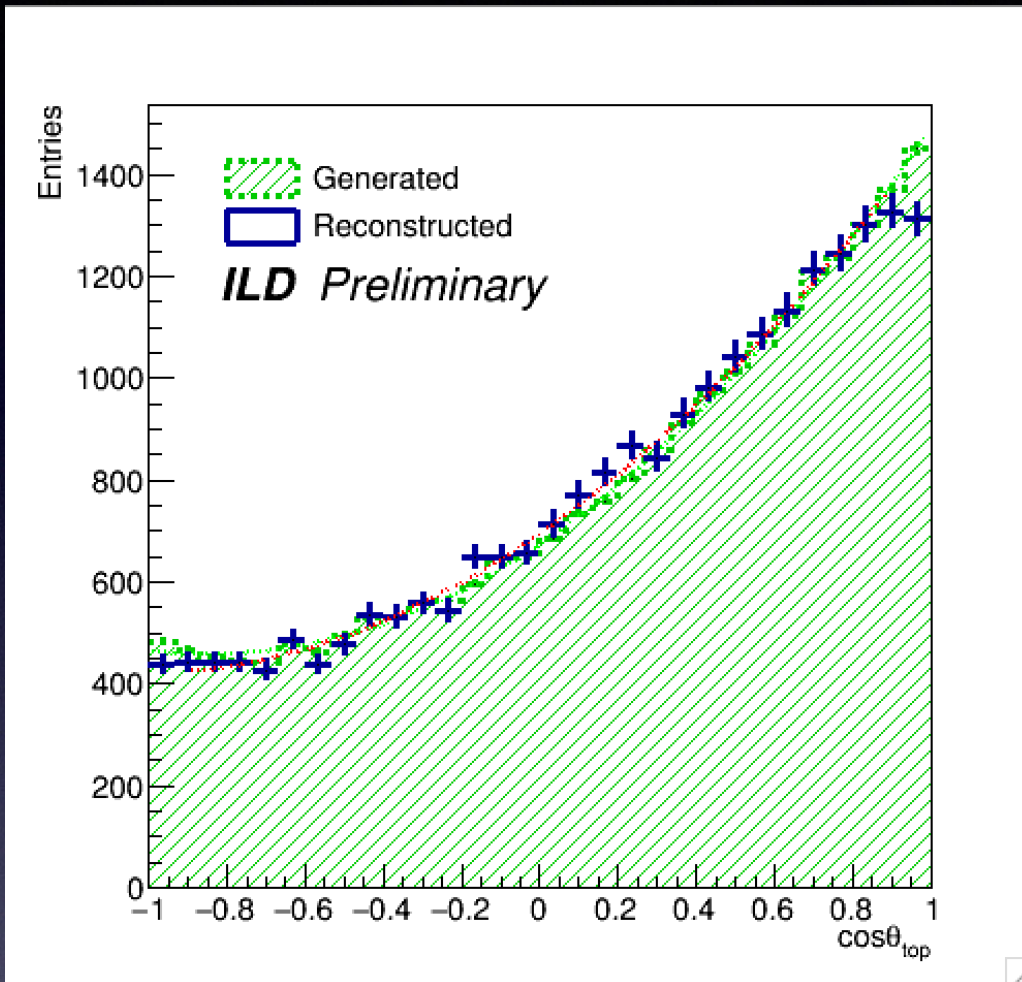


Drop in lepton selection efficiency at the endcap region

Top Polar Angle

【ILCsoft v01-17-11】

【ILCsoft v02-00-01】



Afb gen: 0.329718 N: 164292
Afb reco: 0.337681 N: 23306(102.415%)
Chi2: 1.27346

Afb gen functional: 0.330221
Afb reco functional: 0.339341(102.762%)
Final efficiency: 28.3714% (+-7.88495%)

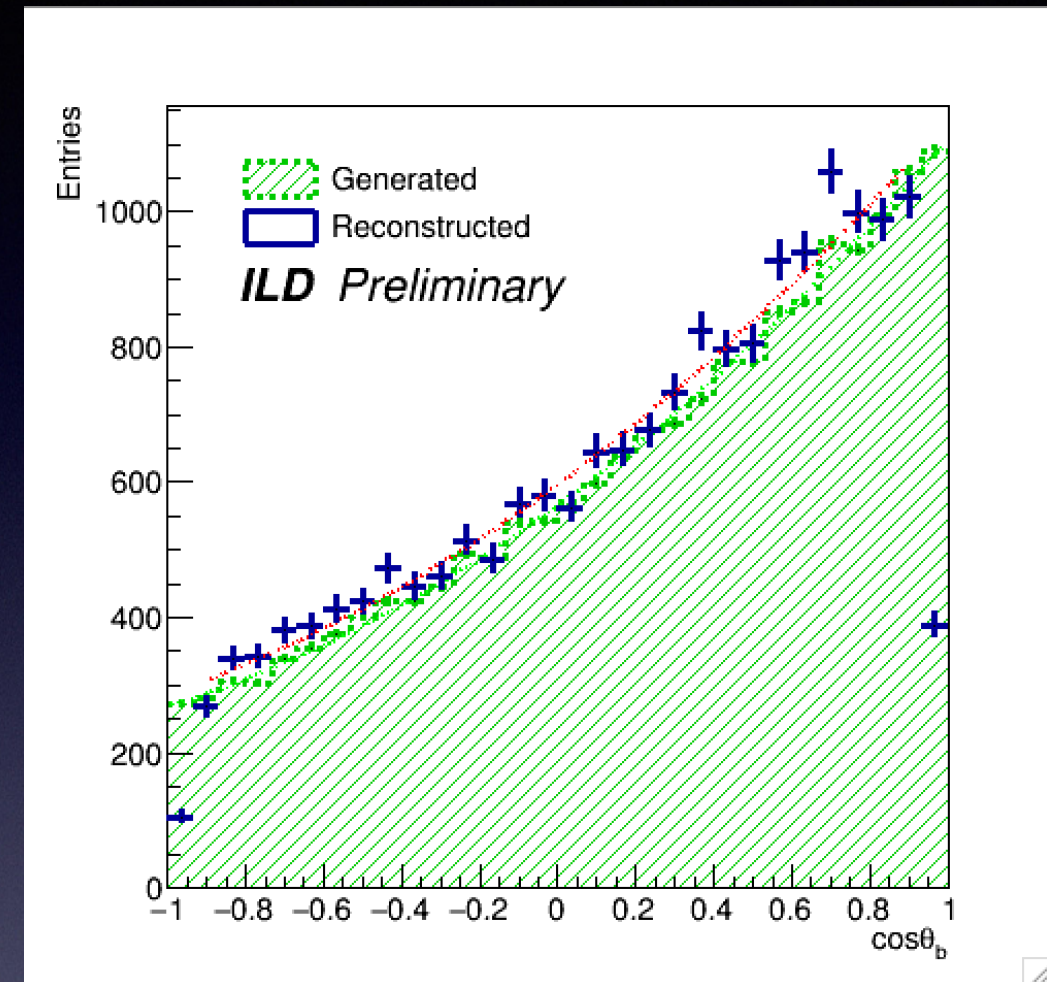
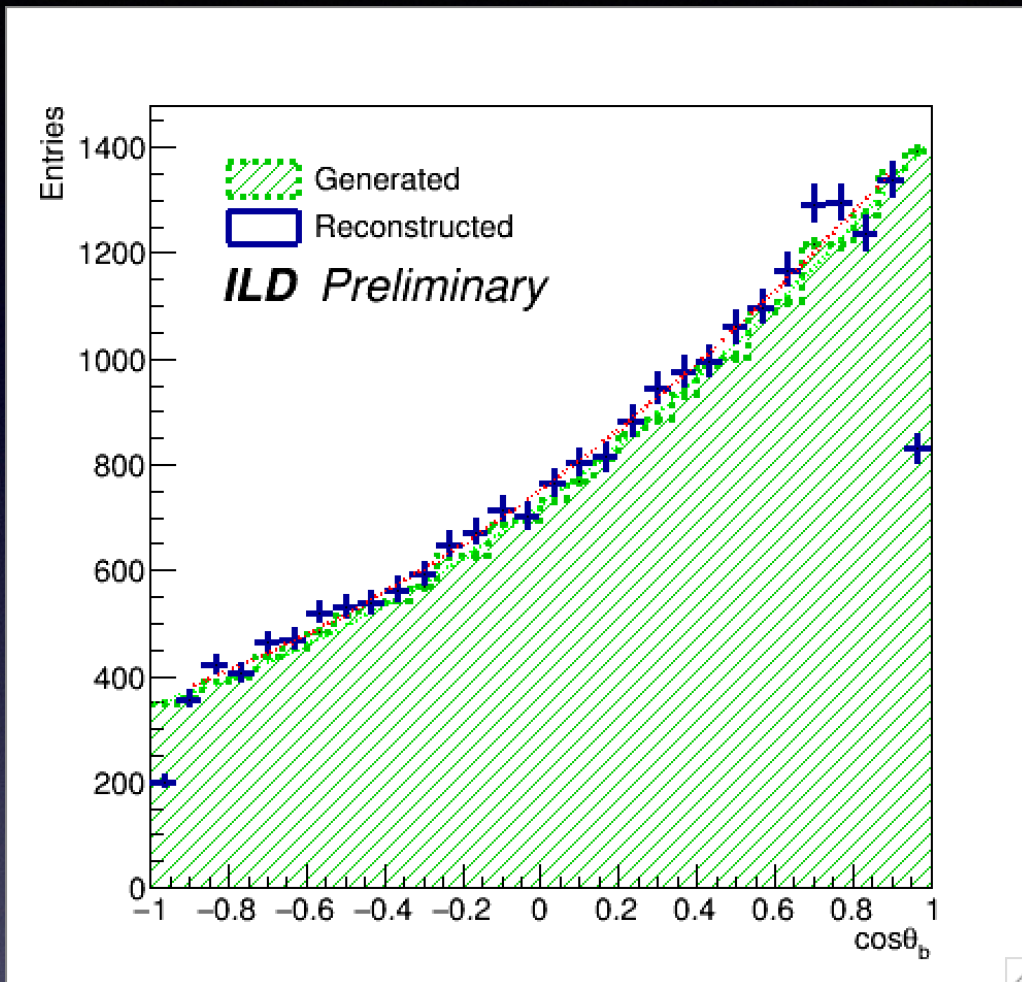
Afb gen: 0.330374 N: 142148
Afb reco: 0.337216 N: 18202(102.071%)
Chi2: 4.81084

Afb gen functional: 0.331114
Afb reco functional: 0.333796(100.81%)
Final efficiency: 25.6099% (+-16.8509%)

b Polar Angle

【ILCsoft v01-17-11】

【ILCsoft v02-00-01】



Afb gen: 0.341952 N: 164292
Afb reco: 0.330301 N: 23306(96.5928%)
Chi2: 10.5052

Afb gen functional: 0.344326
Afb reco functional: 0.338183(98.2159%)
Final efficiency: 28.3714% (+-7.88495%)

Afb gen: 0.341996 N: 142148
Afb reco: 0.319965 N: 18202(93.5582%)
Chi2: 20.8131

Afb gen functional: 0.344674
Afb reco functional: 0.3345(97.0484%)
Final efficiency: 25.6099% (+-16.8509%)

Summary

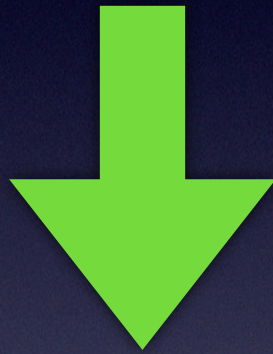
- Transition from ILCsoft **v01-17-11** to **v02-00-01** is done.
- Inefficiencies were observed upon this transition yet minimal. Potential improvement could be done by:
 - a) Switch LeptonFinder to up-to-date
 - b) Extract 'Durham' algorithm from FastJetProcessor
- We are still working with yyxyev sample. Is there any yyxylv sample from IDR yet?

https://ild.ngt.ndu.ac.jp/eelog/dbd-prod/224

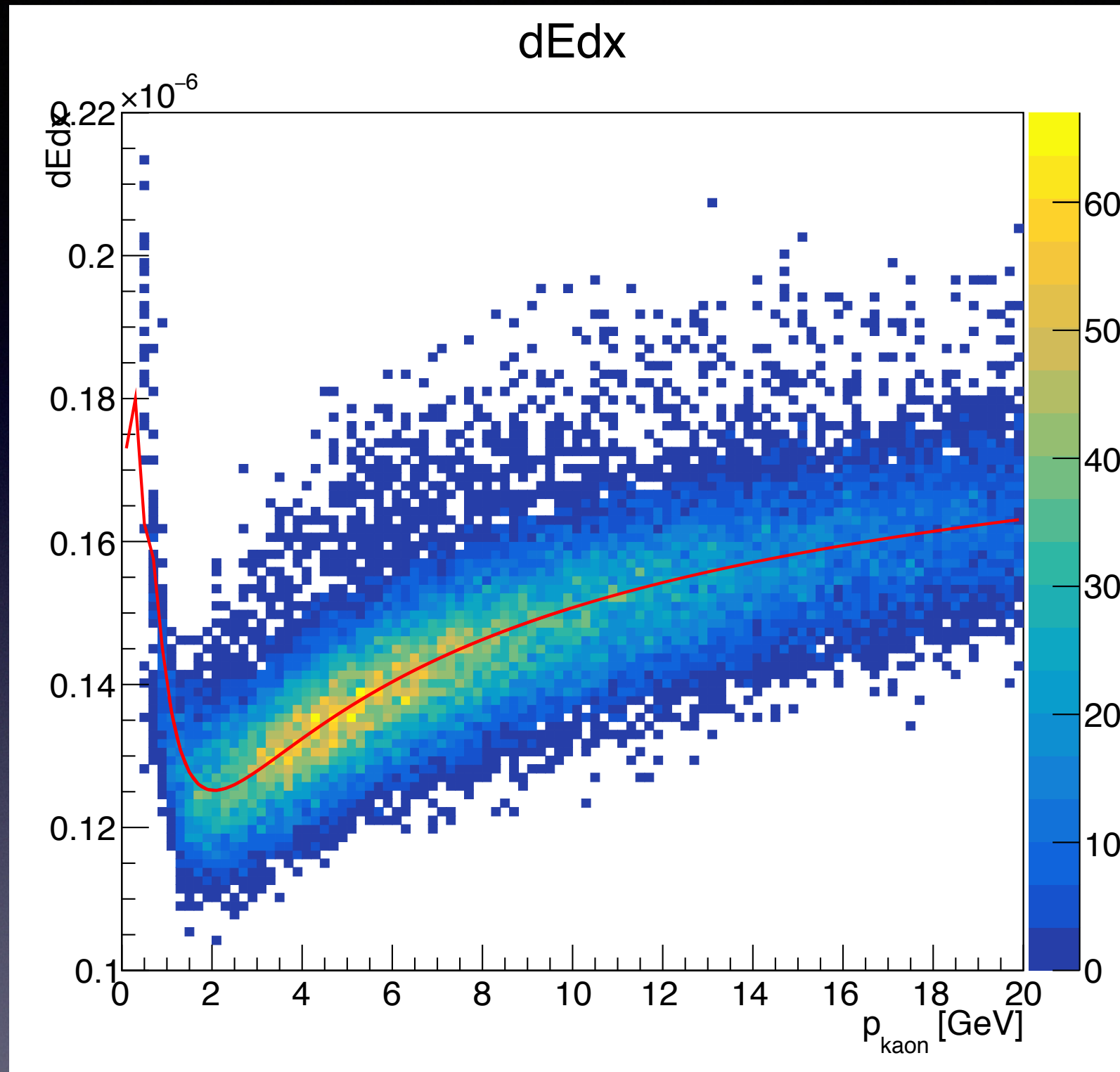
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Attachment 3: dstm-nevents-summary.txt 993 Bytes Uploaded 2018/06/04 03:28:34 | Hide | Hide all
```

```
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ProcID NFile NEvents Filename
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108671 16 102275 rv02-00-01.sv02-00-01.mILD_15_o1_v02.E500-TDR_ws.I108671.Pyyxyev.eR.pL.*.d_dstm_10429*.slcio
108672 2 10000 rv02-00-01.sv02-00-01.mILD_15_o1_v02.E500-TDR_ws.I108672.Pyyxyev.eR.pR.*.d_dstm_10429*.slcio

## Directory : /ilc/prod/ilc/mc-opt-3/ild/dst-merged/500-TDR_ws/6f_ttbar/ILD_s5_o1_v02/v02-00-01
ProcID NFile NEvents Filename
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108671 15 102275 rv02-00-01.sv02-00-01.mILD_s5_o1_v02.E500-TDR_ws.I108671.Pyyxyev.eR.pL.*.d_dstm_10430*.slcio
108672 1 10000 rv02-00-01.sv02-00-01.mILD_s5_o1_v02.E500-TDR_ws.I108672.Pyyxyev.eR.pR.*.d_dstm_10430*.slcio
```



```
[yokugawa@cw13 run_preset]$ ll /hsm/ilc/grid/storm/prod/ilc/mc-opt-3/ild/dst-merged/500-TDR_ws/6f_ttbar/ILD_15_o1_v02/v02-00-01/*yyxyv.eL*
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-rw-rw----+ 1 1800 1800 768M May 28 2018 /hsm/ilc/grid/storm/prod/ilc/mc-opt-3/ild/dst-merged/500-TDR_ws/6f_ttbar/ILD_15_o1_v02/v02-00-01/rv02-00-01.sv02-00-01.mILD_15_o1_v02.E500-TDR_ws.I108675.Pyyxyv.eL.pR.n001.d_dstm_10276_1.slcio
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dEdx vs. p for kaon from Top1

Plotted the dEdx with momentum of kaon from top1, fitted with Bethe-Bloch formula.