“p16.03.00” Certification of the L3 Tau Tool with NN

L3 Meeting

27th April, 2004

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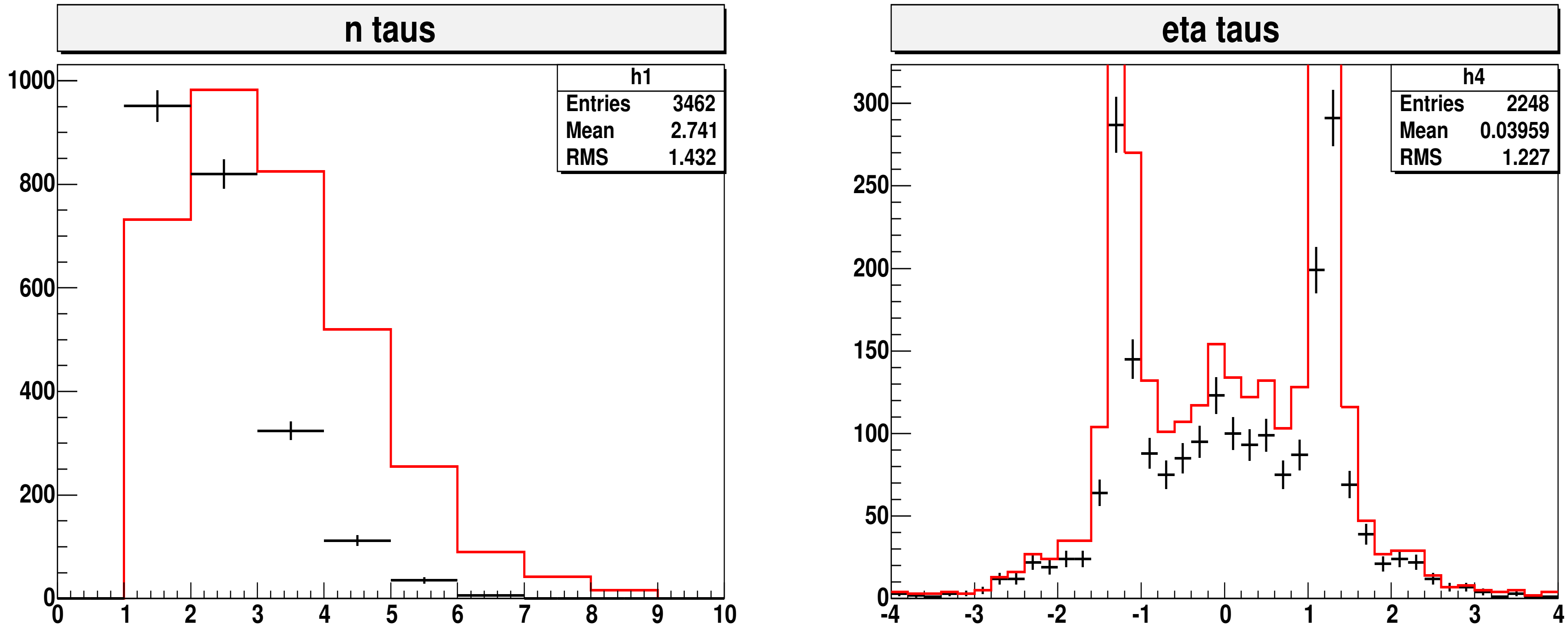
“p16.03.00” vs p16.02.00 and p16.01.00

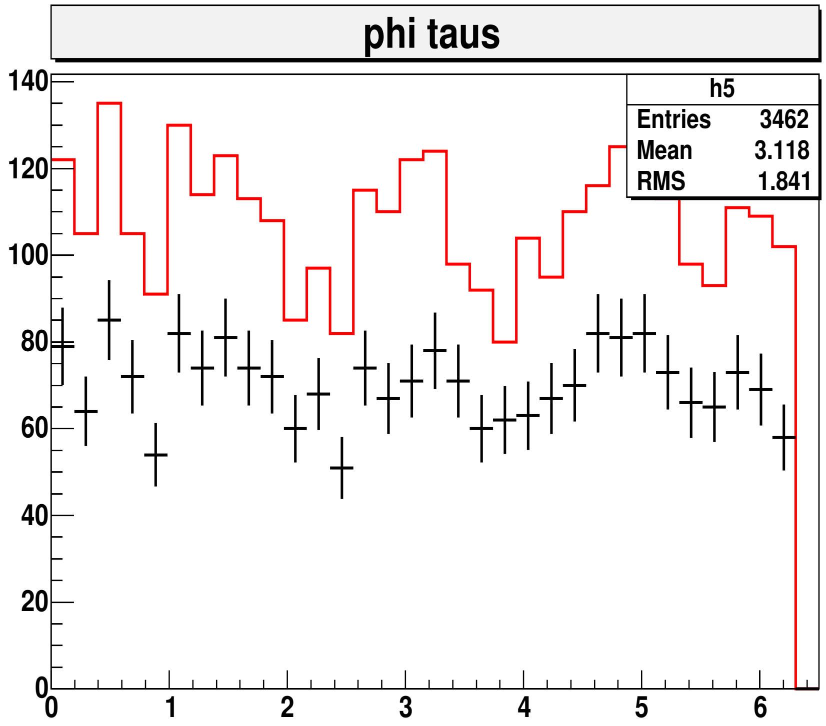
- p16.01.00: NN trained with taus with $|\eta| < 1.5$
- p16.02.00: NN trained with taus with $|\eta| < 3$ to recover efficiency at $|\eta| > 1.5$. Rejection turns out to be bad (well, not too good)
- “p16.03.00” (fictious new version of p16 for now): NN trained with one more variable, ieta, to recover efficiency at $|\eta| > 1.5$
- I used 2000 MC events W$\rightarrow \tau\nu$ (p13.08.00), 9013 events “old data” from Run 179618 (pre-shutdown) and 2702 events “new data” from Run 188672 (post-shutdown)
- I compared
  - the MC trigsimed with “p16.03.00” with same sample in p16.02.00
  - old and new data running the same Tau tool (NN_BASED)
  - new data - online and offline

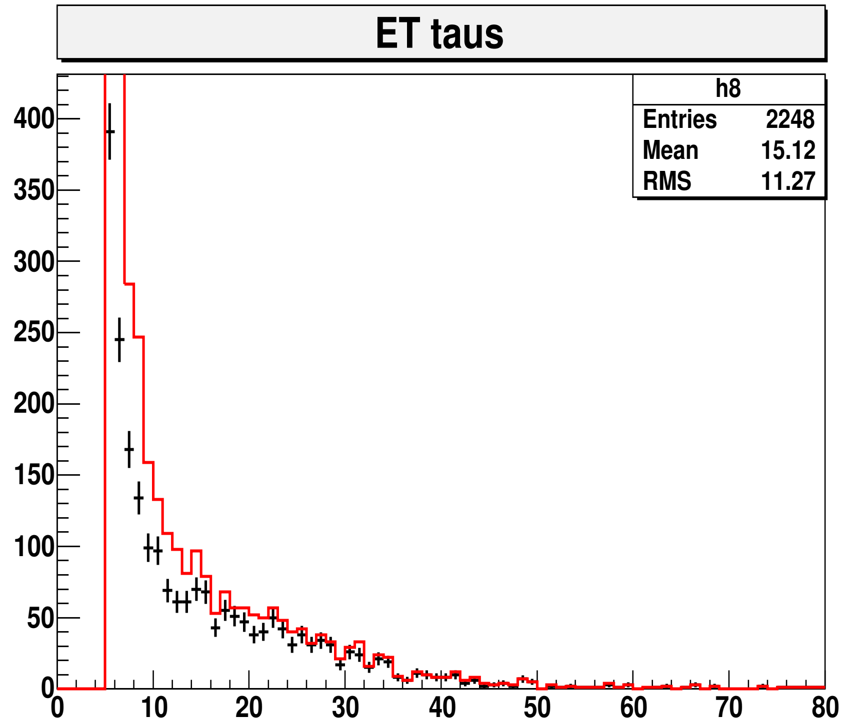
MC p16.03.00 vs MC p16.02.00



- red: MC taus p16.02.00 (NN_BASED algo, nn_cut = 0.1)
- black: MC taus (same sample) p16.03.00 (same cut, BUT 5 input var)

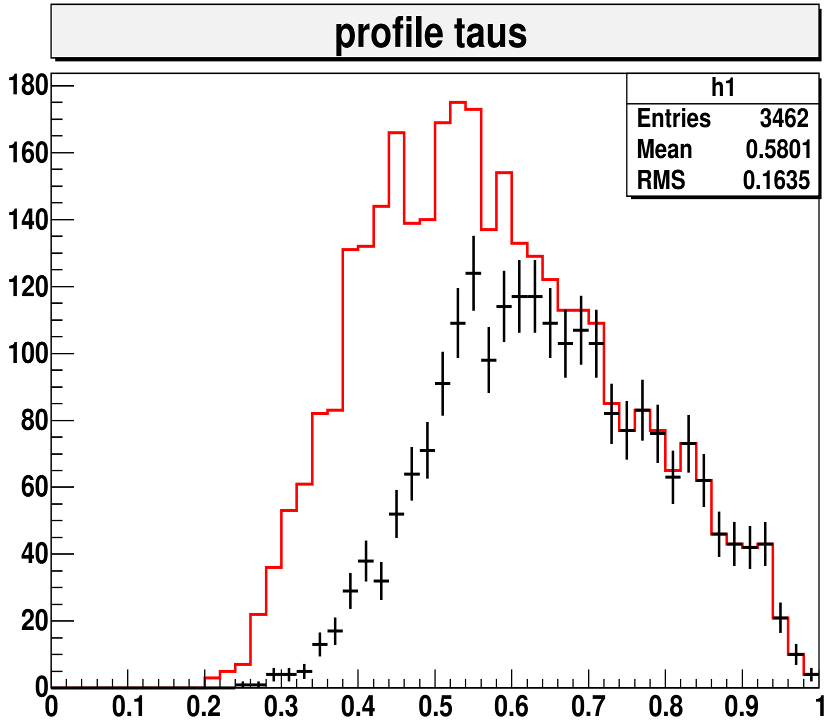
MC p16.03.00 vs MC p16.02.00 (continued)

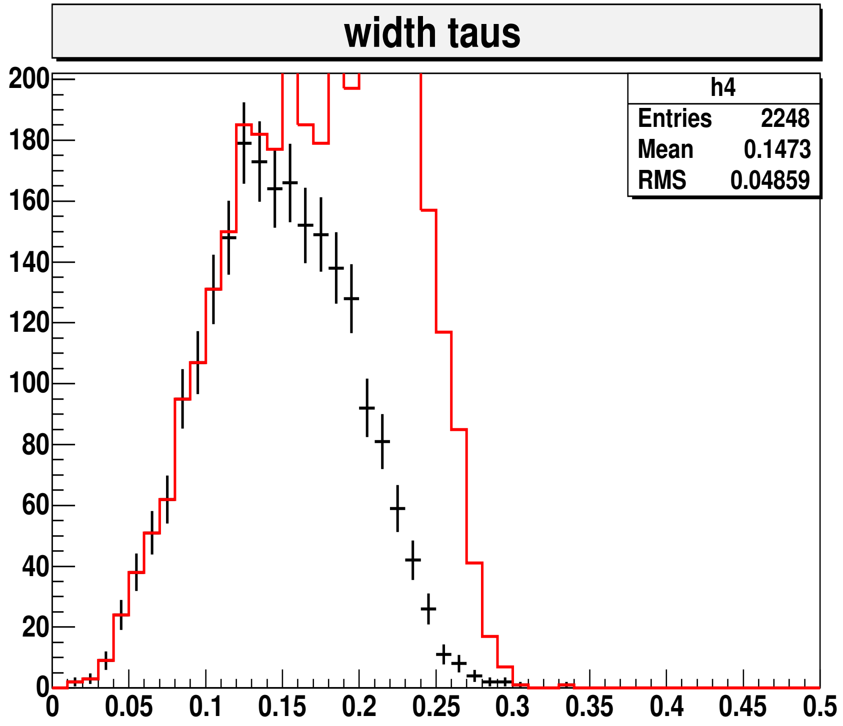


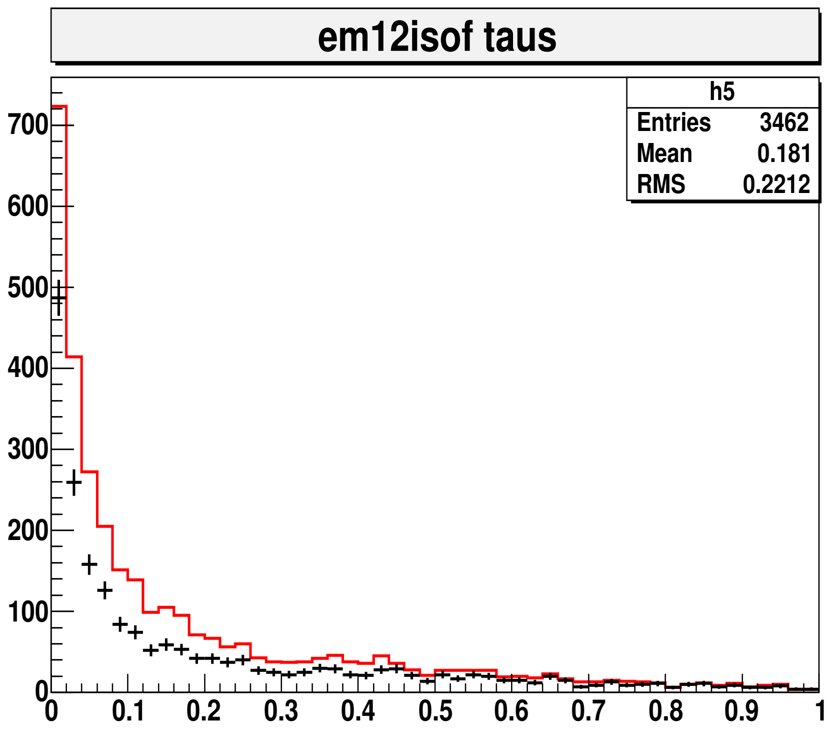


MC p16.03.00 vs MC p16.02.00 (continued)

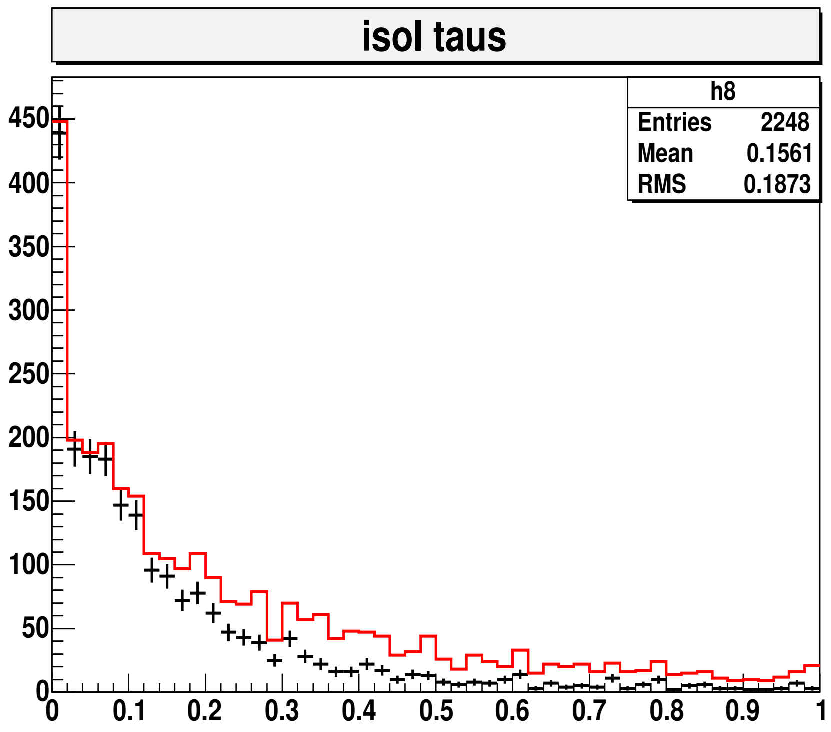
– other useful distributions:



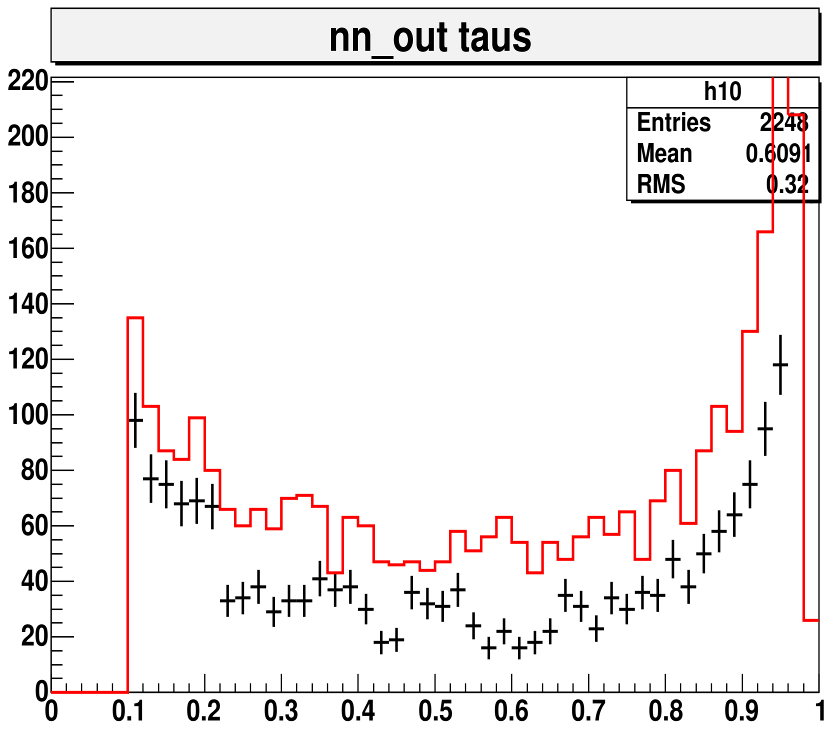




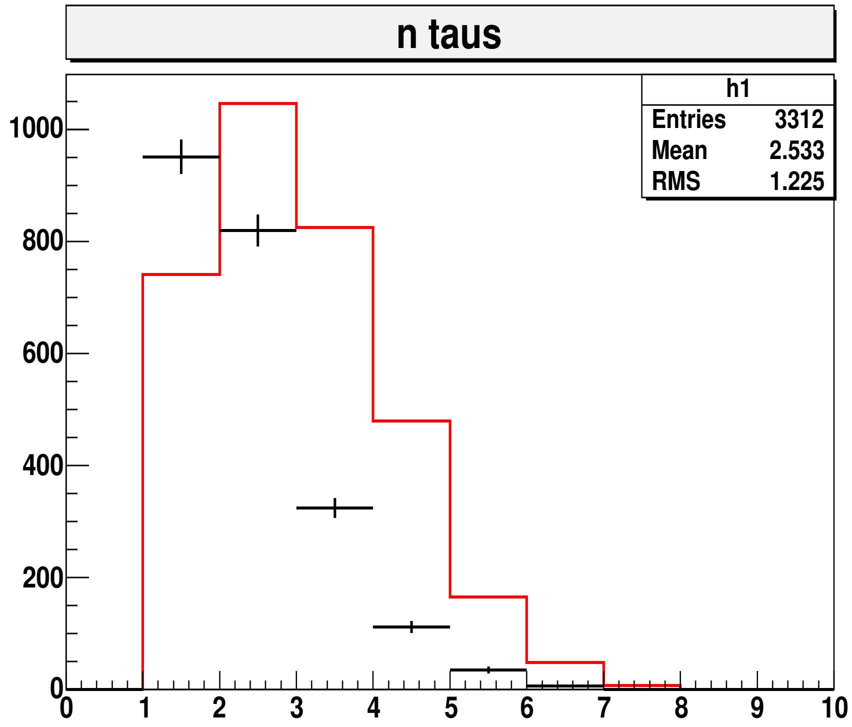
em12isof taus
h5
Entries 3462
Mean 0.181
RMS 0.2212

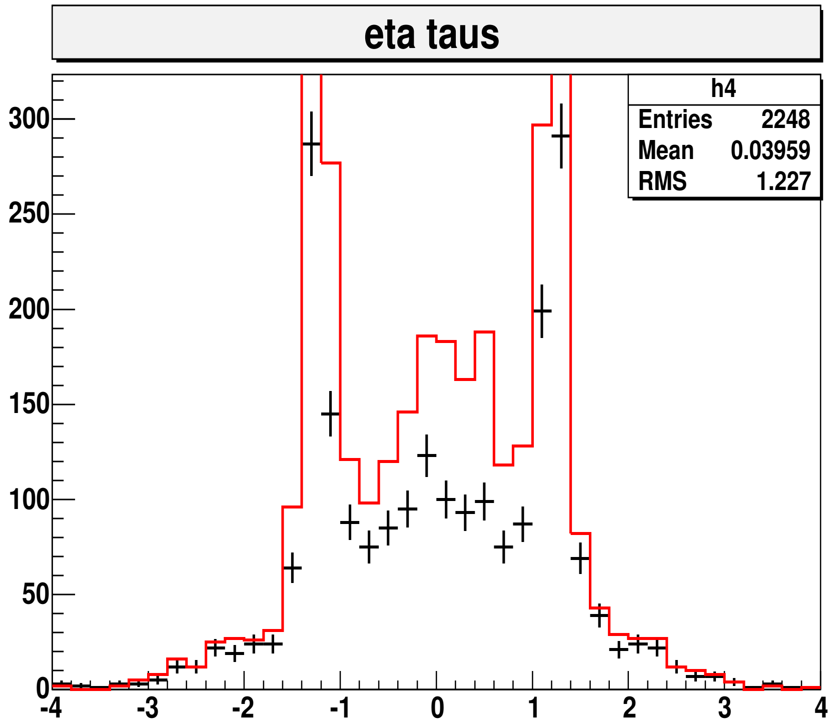


isol taus
h8
Entries 2248
Mean 0.1561
RMS 0.1873


nn_out taus
h10
Entries 2248
Mean 0.6091
RMS 0.32
0
20
40
60
80
100
120
140
160
180
200
220
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

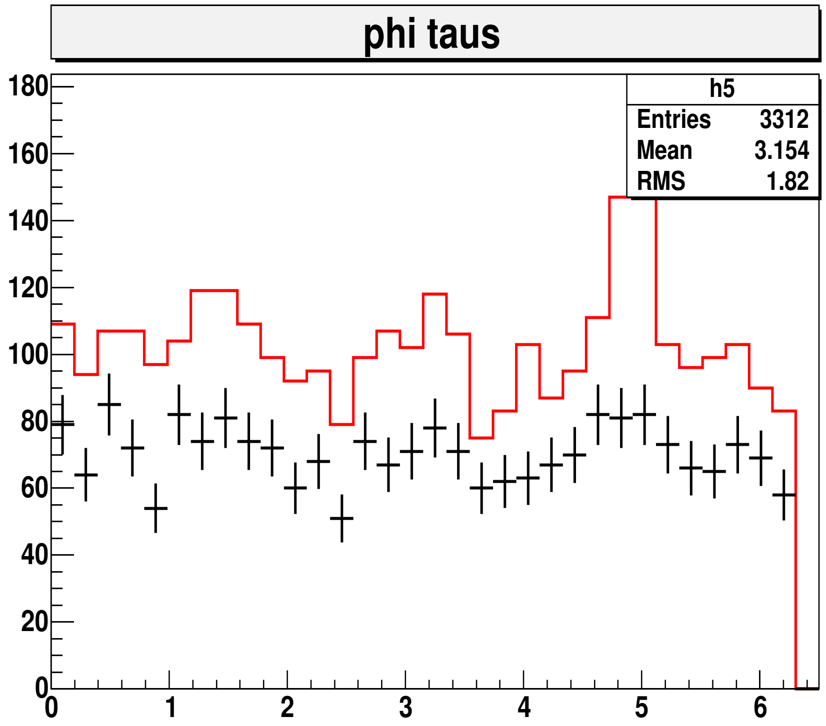
MC p16.03.00 vs MC p16.01.00

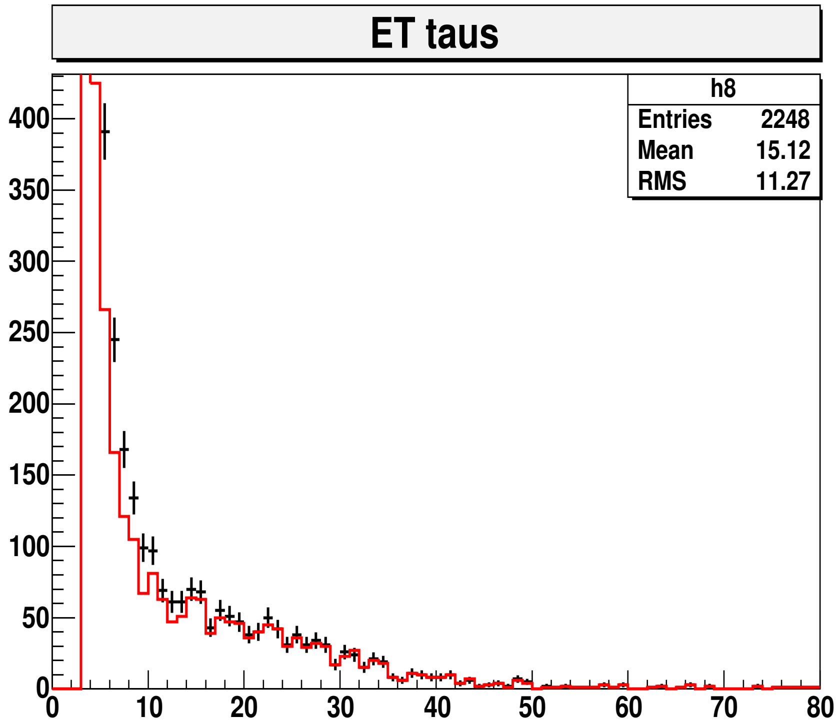




- red: MC taus p16.01.00 (NN_BASED algo, nn_cut = 0.1)
- black: MC taus (same sample) p16.03.00 (5 input var)

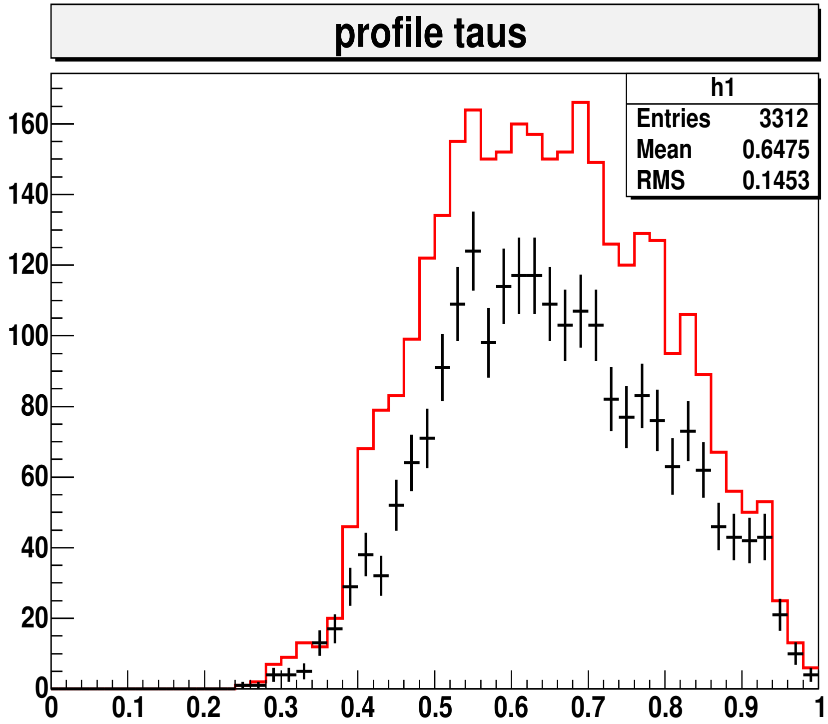
MC p16.03.00 vs MC p16.01.00 (continued)

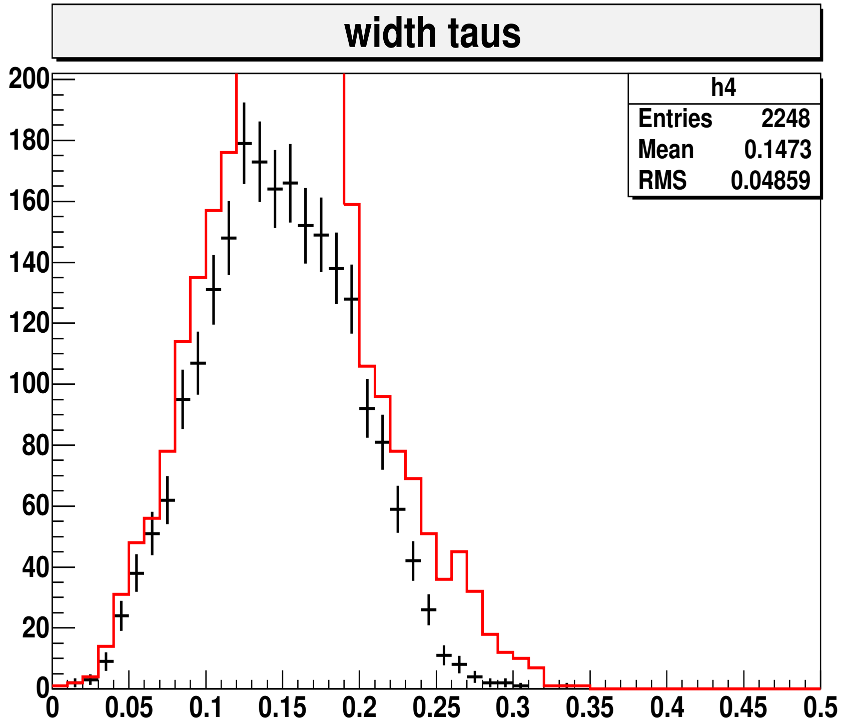


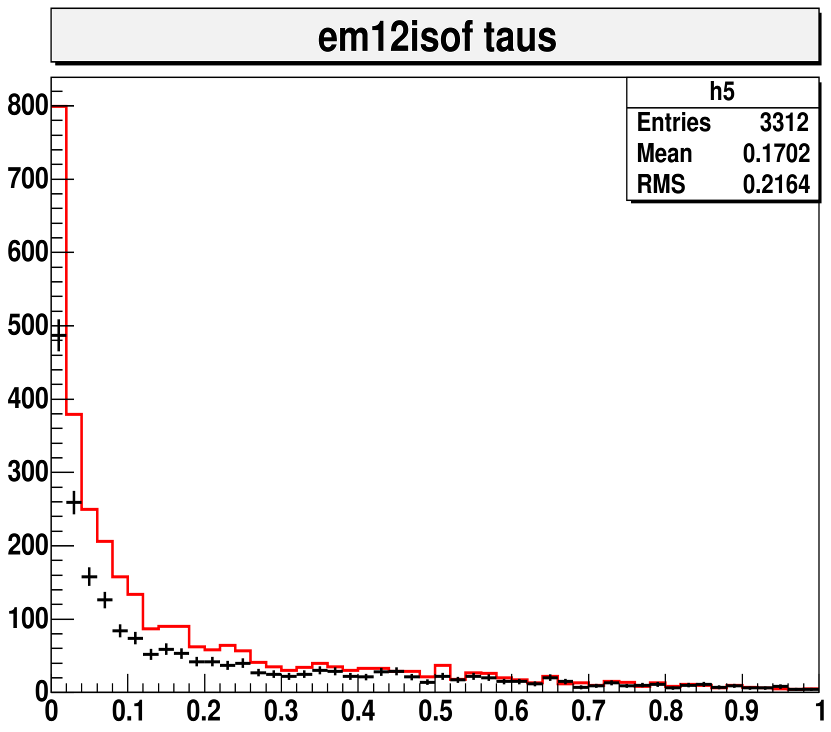


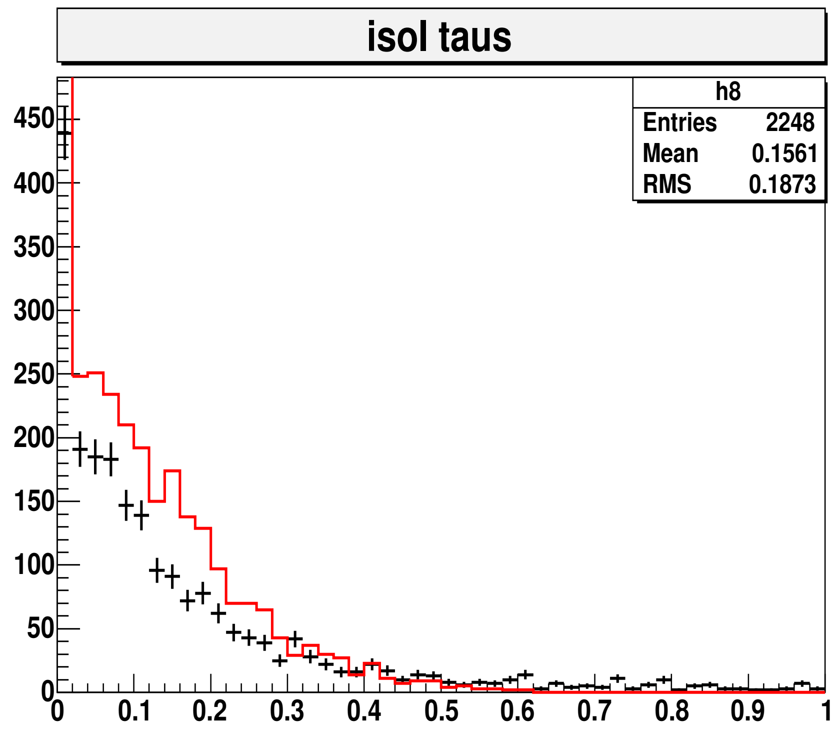
MC p16.03.00 vs MC p16.01.00 (continued)

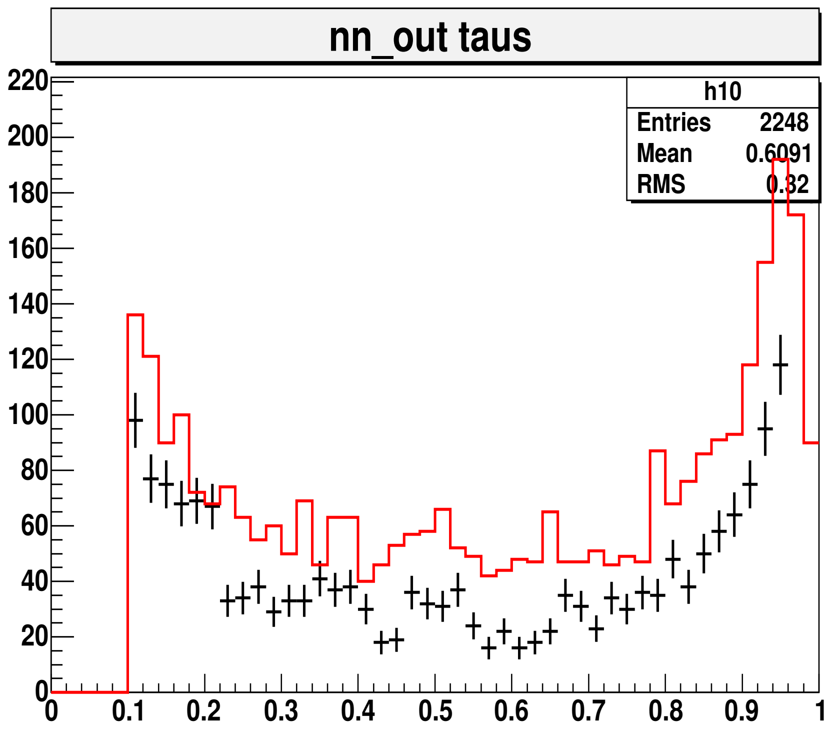
– other useful distributions:



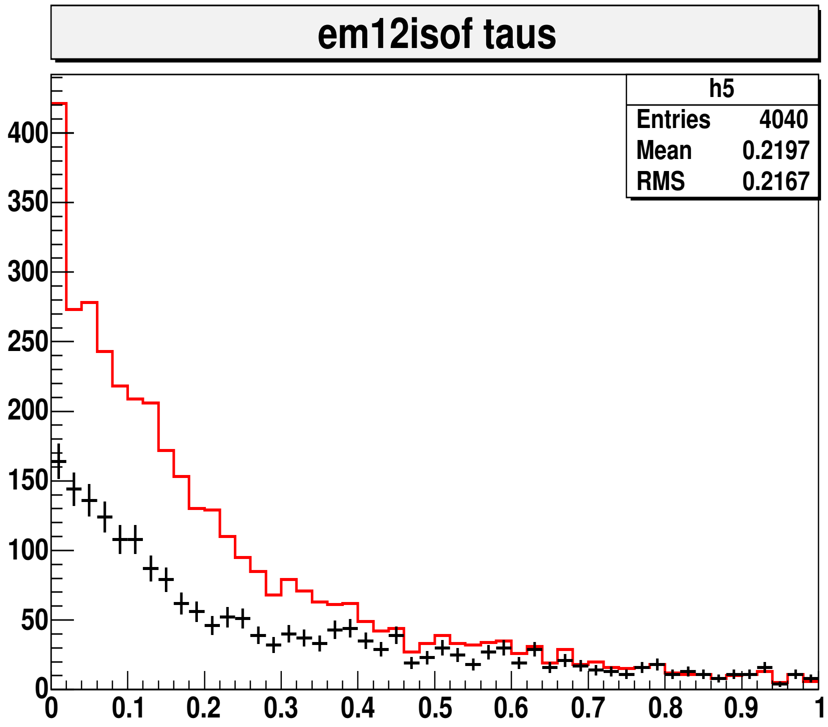


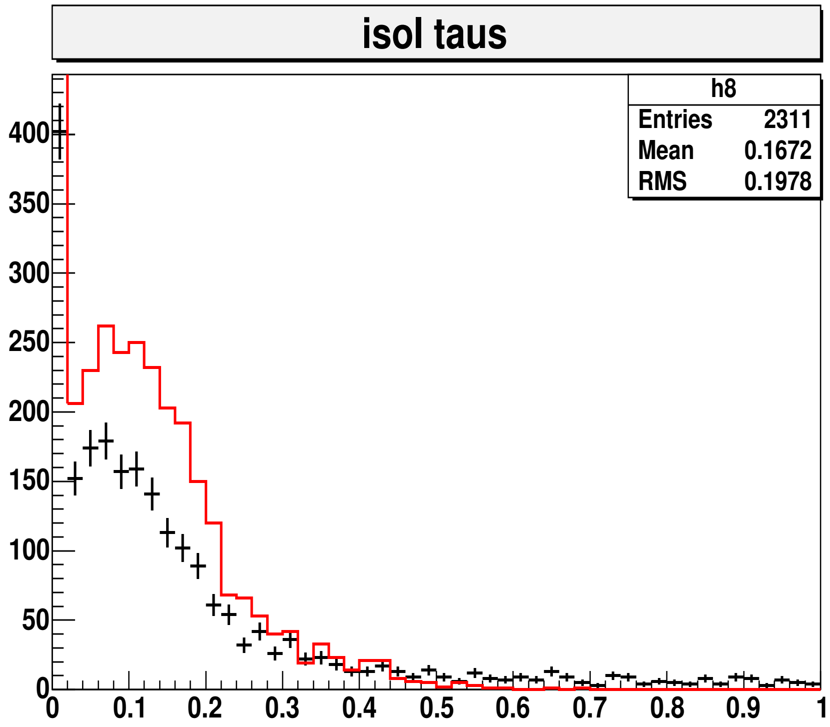

em12isof taus
h5
Entries 3312
Mean 0.1702
RMS 0.2164
0
100
200
300
400
500
600
700
800
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1


isol taus
h8
Entries 2248
Mean 0.1561
RMS 0.1873
0
50
100
150
200
250
300
350
400
450
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1


nn_out taus
h10
Entries 2248
Mean 0.6091
RMS 0.32
220
200
180
160
140
120
100
80
60
40
20
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

p1601 vs p1603 on NEW DATA

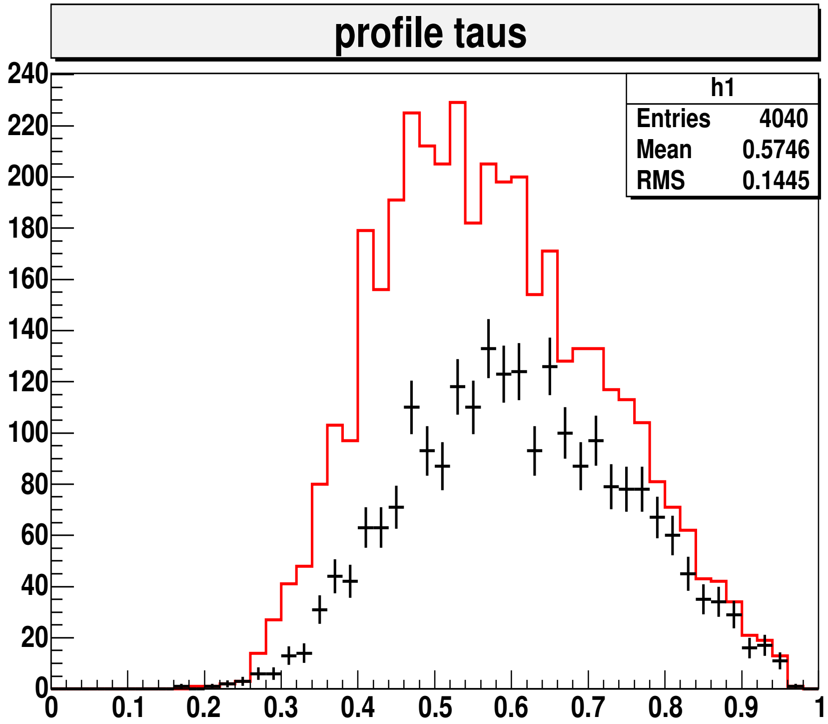


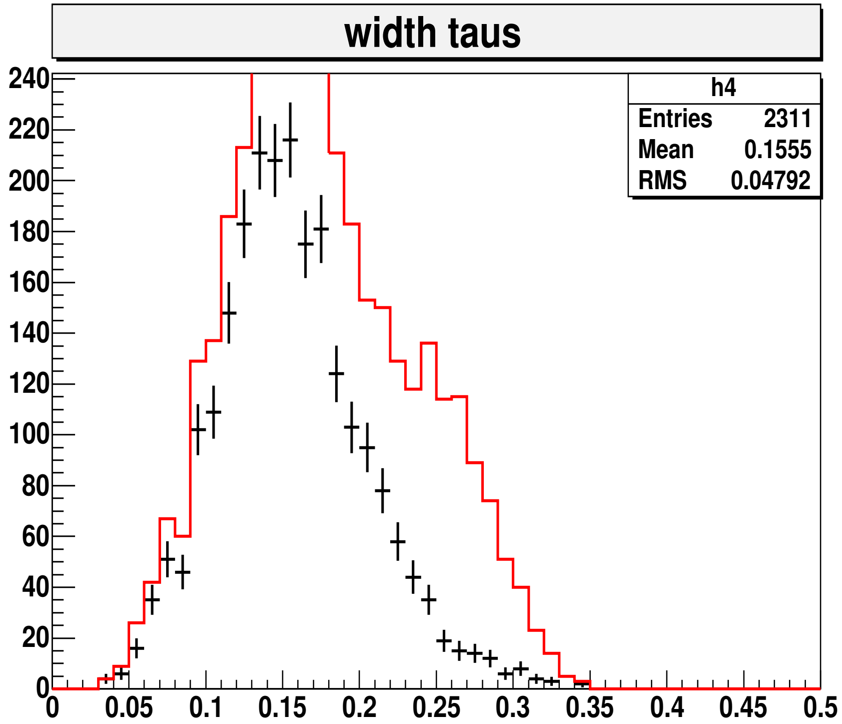


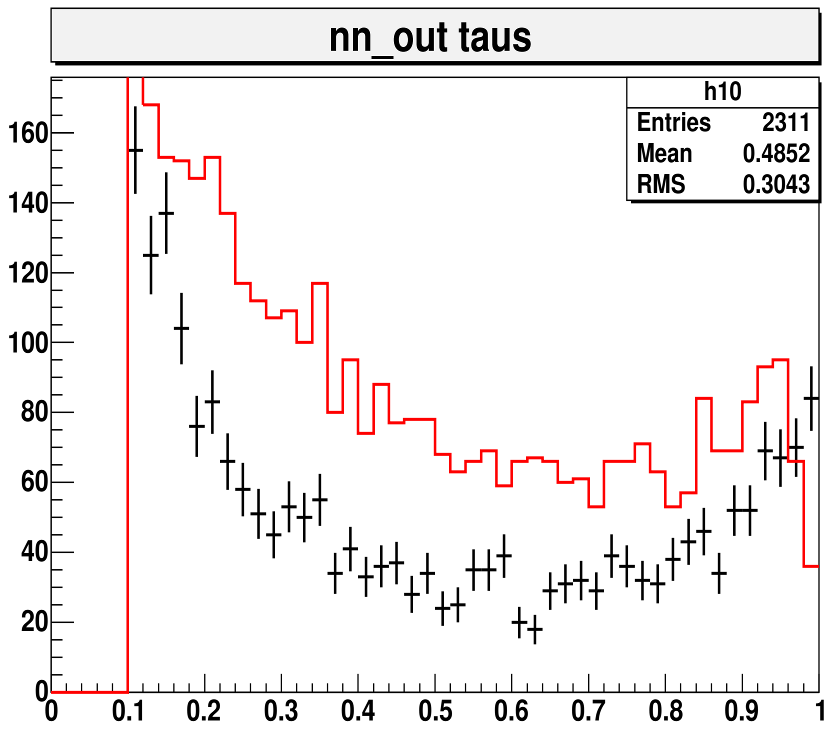
- red: new data p16.01.00 (nn_cut = 0.1, 4 input var)

- black: new data p16.03.00 (same cut, 5 input var)

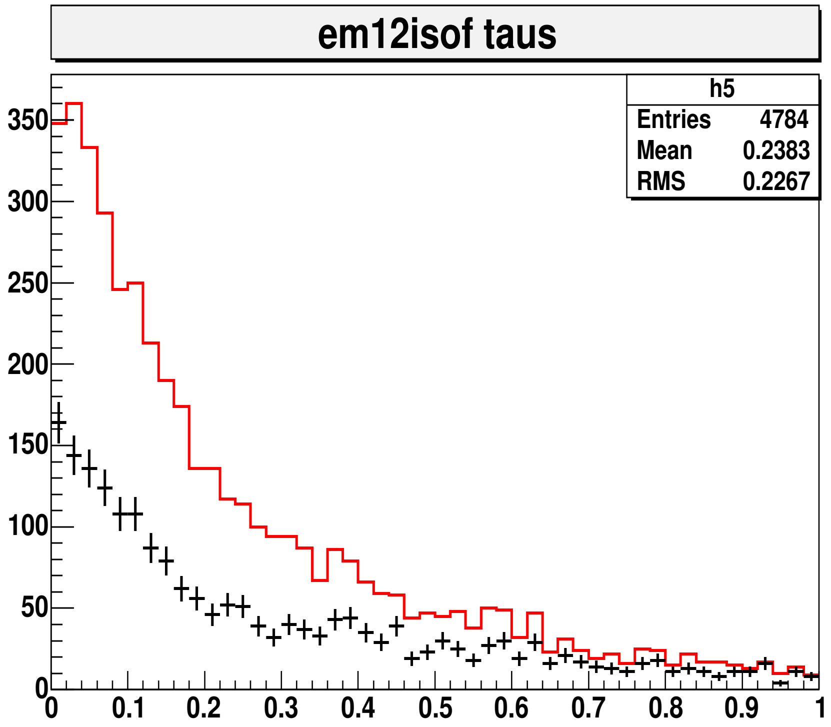
p1601 vs p1603 on NEW DATA - continued

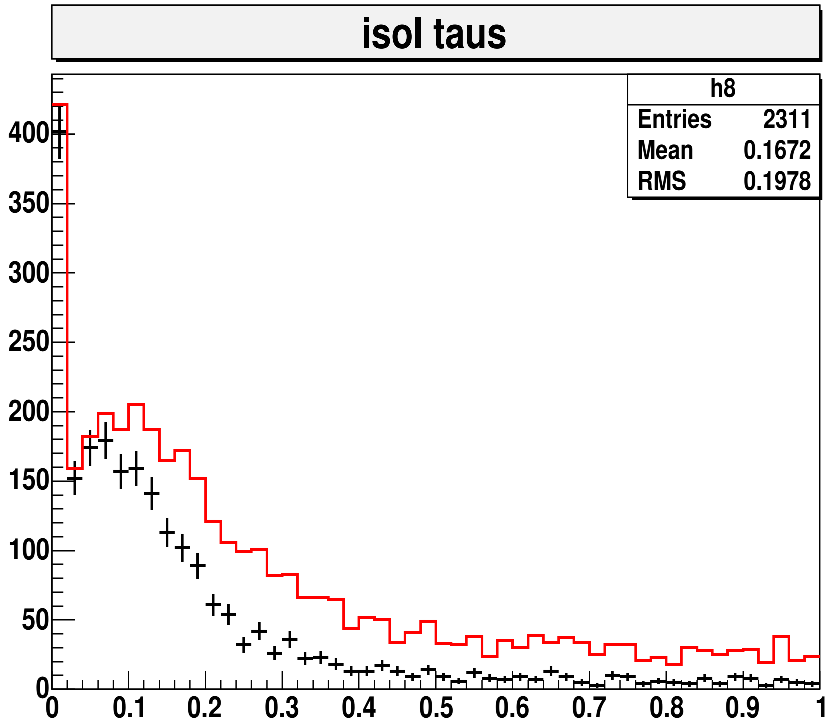





nn_out taus
h10
Entries 2311
Mean 0.4852
RMS 0.3043
0
20
40
60
80
100
120
140
160
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1

p1602 vs p1603 on NEW DATA

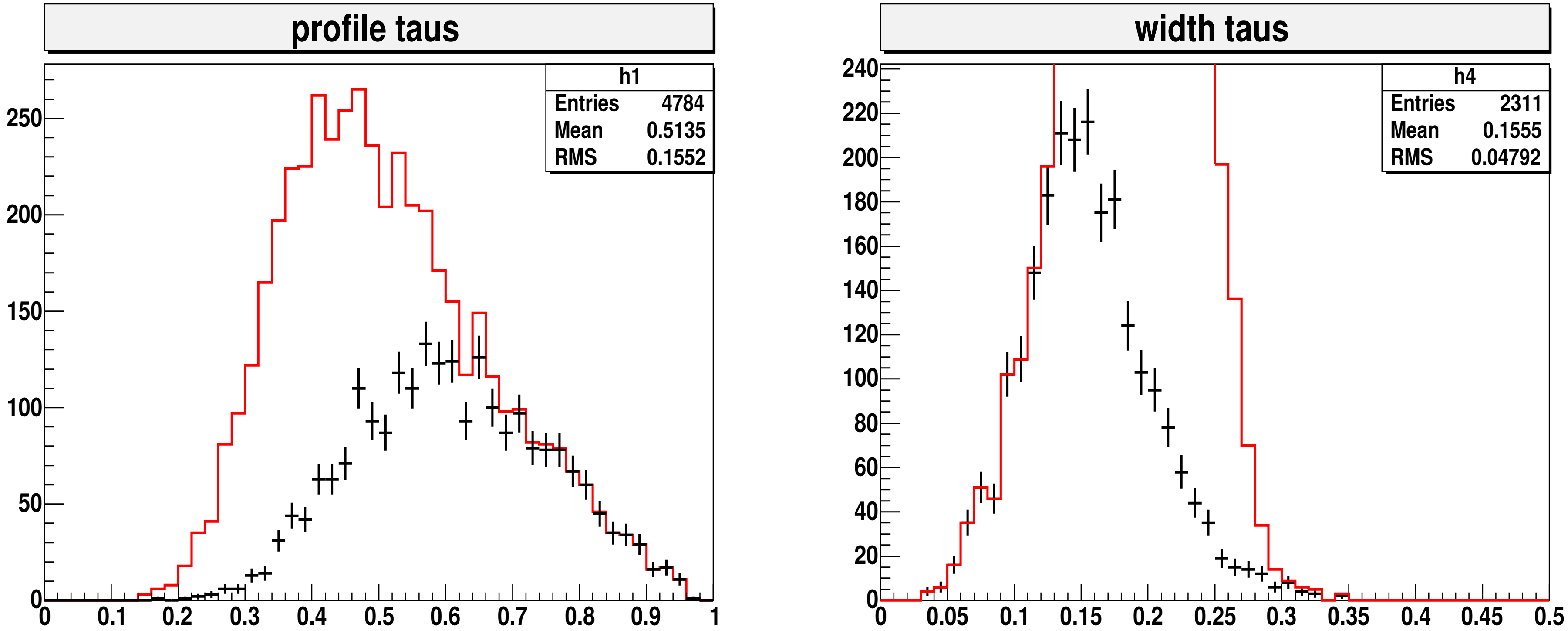


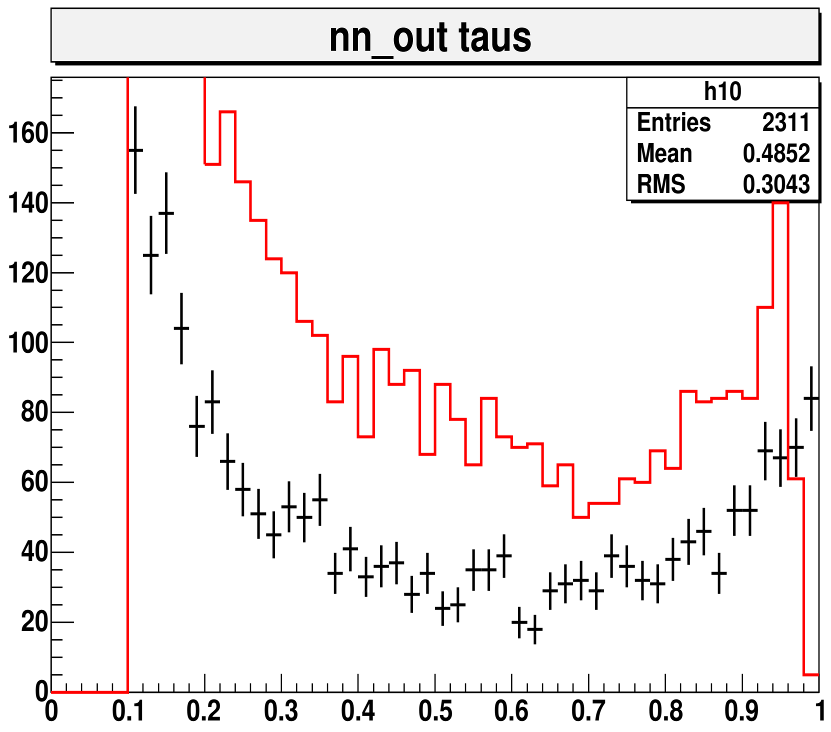


– red: new data p16.02.00 (nn_cut = 0.1, 4 input var)

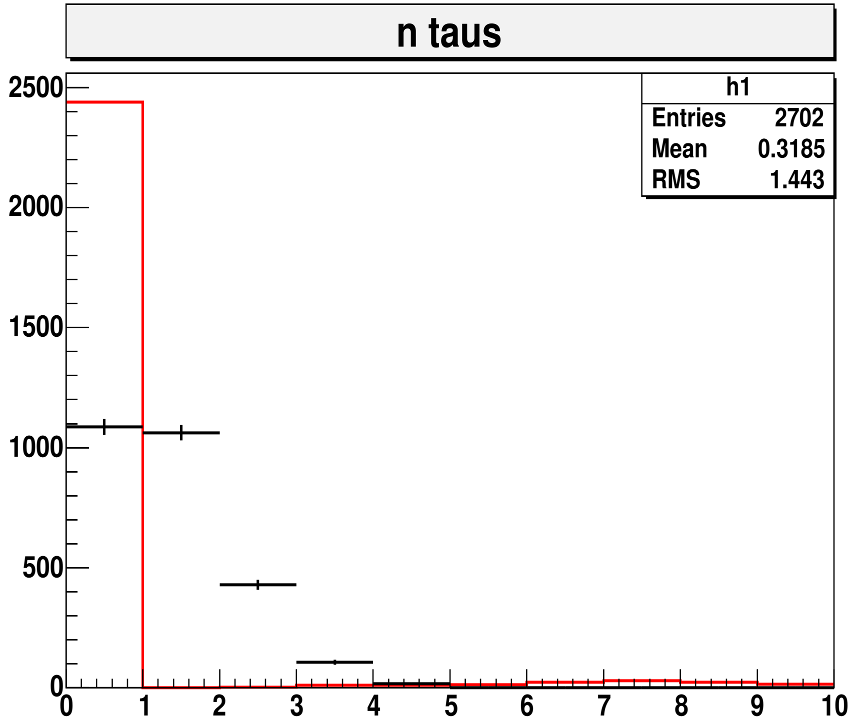
– black: new data p16.03.00 (same cut, 5 input var)

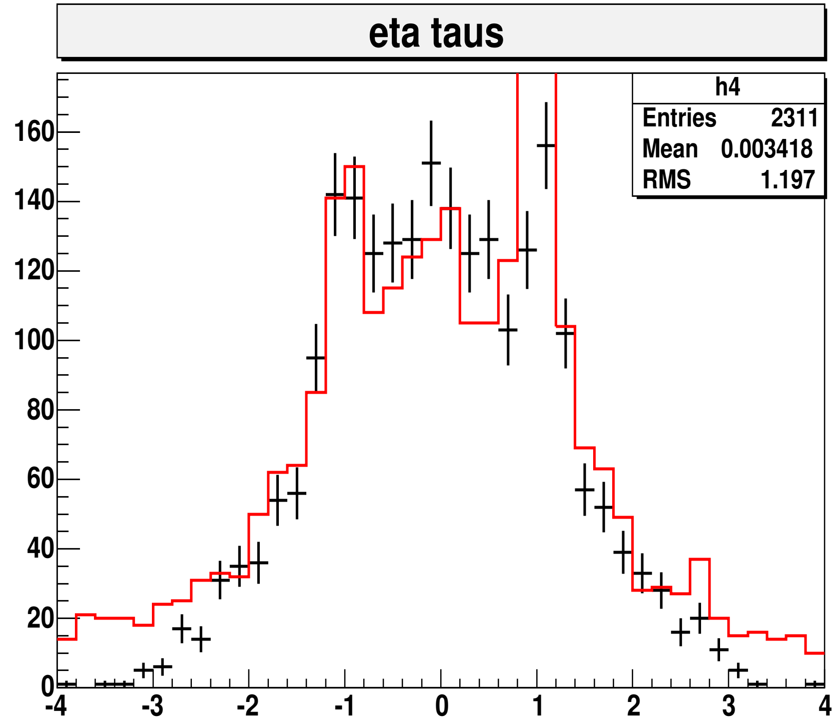
p1602 vs p1603 on NEW DATA - continued




nn_out taus
h10
Entries 2311
Mean 0.4852
RMS 0.3043
0
20
40
60
80
100
120
140
160
0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1

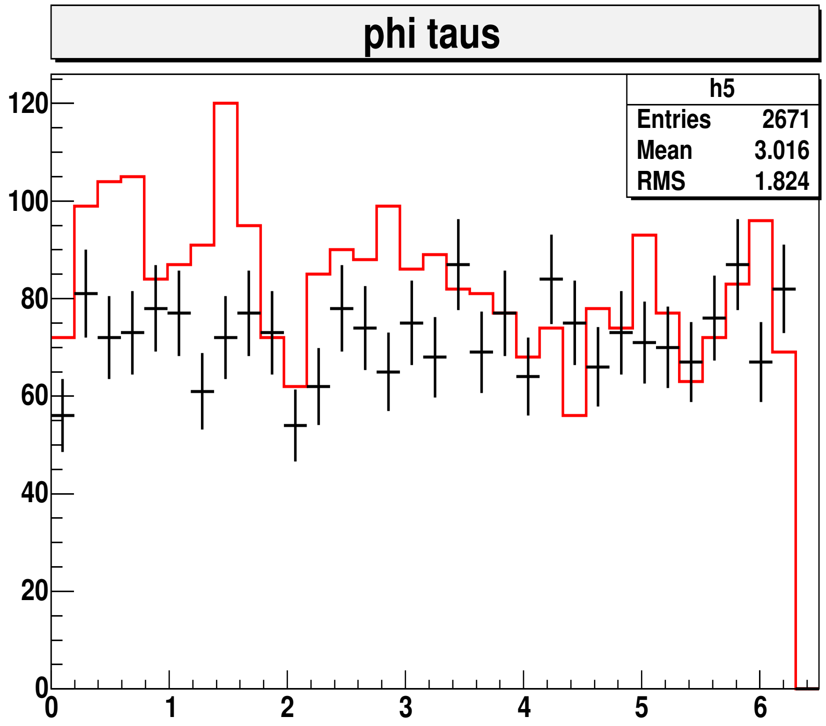
New data: online (CAL) vs offline (NN)

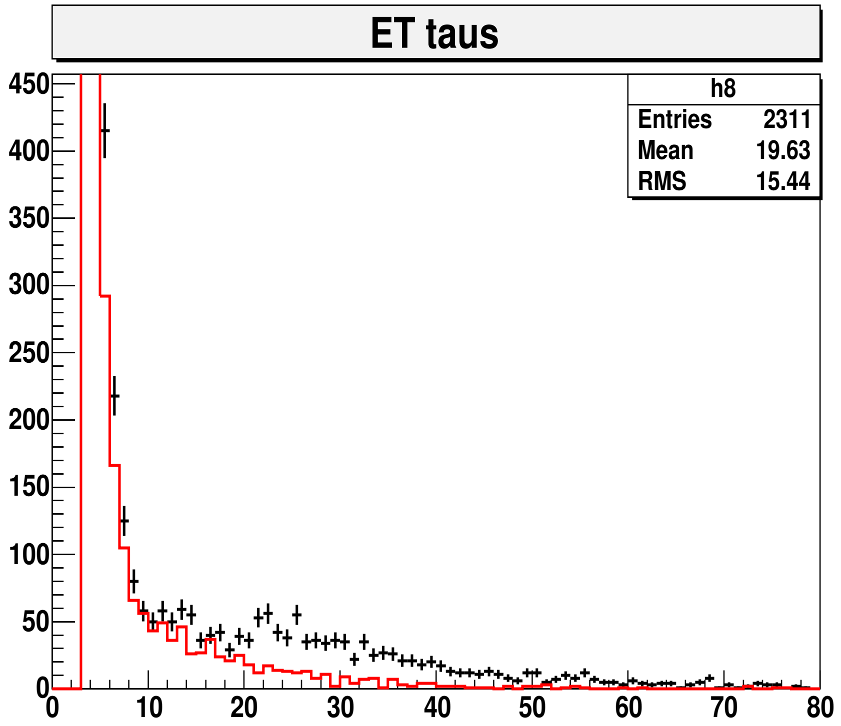




- red: online (CAL_BASED)
- black: offline (p16.03.00 NN_BASED)

New data: online (CAL) vs offline (NN)- continued





Efficiency and Rejection in p16.03.00