

Study of $B^+ \rightarrow K^+ \tau^+ \tau^-$ using hadronic tagging

Debjit Ghosh

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Change in ROE selections

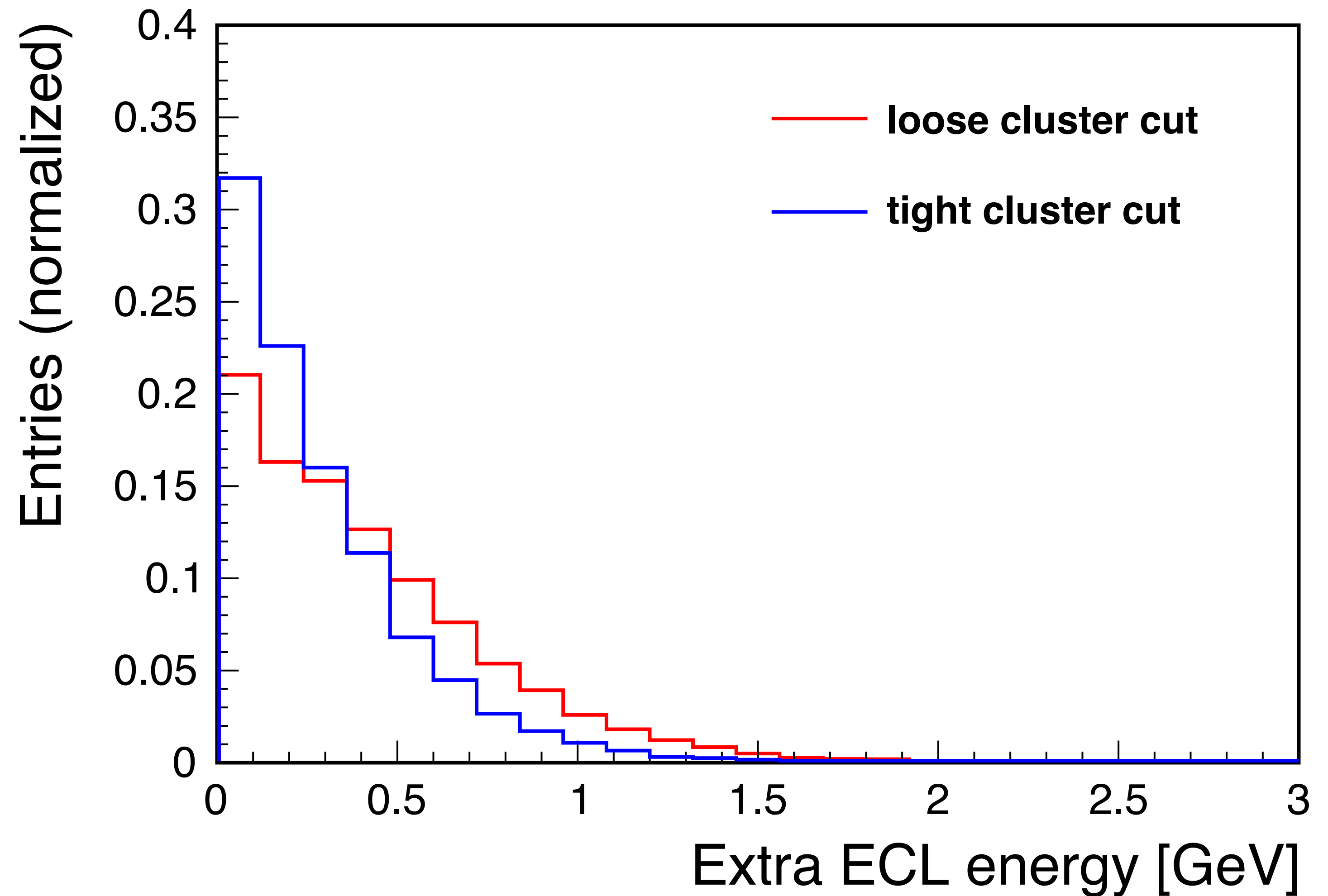
signalMC

Previous

- $E > 0.06$
- $|\text{cluster time}| < 20$

New

- $\text{clusterNHits} > 1.5$
- $E > 0.080$ in forwards
- $E > 0.030$ in barrel
- $E > 0.060$ in backward
- $|\text{cluster time}| < 200$
- $\text{minC2TDist} > 20$
- $\left| \frac{\text{cluster time}}{\text{clusterErrorTiming}} \right| < 2.0$



Test of truth match flag

22 % difference

signalMC

```
# reconstruct signal side B-mesons
ma.reconstructDecay(decayString='B+:ch0 -> K+:sel e+:sel e-:sel',
                    cut='',
                    dmID=0,
                    path=main)
ma.reconstructDecay(decayString='B+:ch1 -> K+:sel e+:sel mu-:sel',
                    cut='',
                    dmID=1,
                    path=main)
ma.reconstructDecay(decayString='B+:ch2 -> K+:sel mu+:sel e-:sel',
                    cut='',
                    dmID=2,
                    path=main)
```

events selected using topoana -> 4849

isSignalAcceptMissingNeutrino -> 3779

```
# reconstruct signal side B-mesons
ma.reconstructDecay(decayString='tau+:ch0 -> e+:sel',
                    cut='',
                    dmID=0,
                    path=main)

ma.reconstructDecay(decayString='tau+:ch1 -> mu+:sel',
                    cut='',
                    dmID=1,
                    path=main)

ma.reconstructDecay(decayString='tau+:ch2 -> pi+:sel ?nu',
                    cut='',
                    dmID=2,
                    path=main)
```

events selected using topoana -> 4849

isSignalAcceptMissingNeutrino -> 3779

```
# reconstruct signal side B-mesons
ma.reconstructDecay(decayString='tau+:ch0 =direct=> e+:sel ?nu',
                    cut='',
                    dmID=0,
                    path=main)

ma.reconstructDecay(decayString='tau+:ch1 =direct=> mu+:sel ?nu',
                    cut='',
                    dmID=1,
                    path=main)

ma.reconstructDecay(decayString='tau+:ch2 =direct=> pi+:sel ?nu',
                    cut='',
                    dmID=2,
                    path=main)
```

events selected using topoana -> 4849

isSignal -> 3779

isSignalAcceptMissingNeutrino -> 3779