

# Analysis cuts repository

## Repository of analysis cuts

This page documents the most important set of cuts that we routinely use for analysis in the beam test

### System test - updated 26/11/2007

- Look only good events with one track and a hit in the last tracker layer  
kBaseCut = 'TkrNumTracks>=1 && Tkr1LastLayer==0'
- Time between two events has to be greater than 1ms to cure the pedestal drift issue  
kDataCut = '(GemDeltaEventTime\*50/1000000)>1. && EventGtccFifo==0'
- Process fiducial cuts (Nicola's cuts) to remove double particles  
kEMaxCut = 1.e6  
if kEnergy>2500 :  
kBaseCut += '&& CalEnergyRaw>200'  
if (kEnergy == 500 ):  
kEMaxCut = 445./kAbsCosAngle  
elif (kEnergy == 1000 ):  
kEMaxCut = 900./kAbsCosAngle  
elif (kEnergy == 2500 ):  
kEMaxCut = 2200./kAbsCosAngle  
elif (kEnergy == 5000 ):  
kEMaxCut = 4500./kAbsCosAngle  
elif (kEnergy == 10000 ):  
kEMaxCut = 9000./kAbsCosAngle  
elif (kEnergy == 20000 ):  
kEMaxCut = 17000./kAbsCosAngle  
elif (kEnergy == 49980 ):  
kEMaxCut = 44000./kAbsCosAngle  
elif (kEnergy > 90000. and kEnergy < 100000):  
kEMaxCut = 90000./kAbsCosAngle  
elif (kEnergy > 190000. and kEnergy < 201000.):  
kEMaxCut = 140000/kAbsCosAngle  
elif (kEnergy > 270000. and kEnergy < 300001.):  
kEMaxCut = 180000/kAbsCosAngle  
kBaseCut += '&& CalEnergyRaw<%' % kEMaxCut

### TKR hits and PSF analysis

#### A1 events

```
VtxNumVertices==1 && Tkr1LastLayer == 0 && Tkr2LastLayer == 0 && Tkr1FirstLayer >1 && Tkr2FirstLayer > 1 && (VtxStatus&0x0002)>0 && CalCsIRLn>6
```

#### A21 events

```
Tkr1LastLayer == 0 && Tkr1FirstLayer > 1 && (VtxStatus&0x0001)>0 && CalCsIRLn>6
```

Nicola's Cuts:

#### A.1.1 events

```
VtxNumVertices==1 && TkrNumTracks == 2 && Tkr1LastLayer == 0 && Tkr2LastLayer == 0 && Tkr1FirstLayer >1 && Tkr2FirstLayer > 1 && (VtxStatus&0x0002)>0 && CalCsIRLn>6
```

#### A.2.1 events

```
VtxNumVertices==1 && TkrNumTracks == 1 && Tkr1LastLayer == 0 && Tkr1FirstLayer > 1 && (VtxStatus&0x0001)>0 && CalCsIRLn>6
```

Neutral vertex issue for A.1 class:

Do not use "VtxNumVertices", "(VtxStatus&0x0002)>0 && TkrNumTracks==2" give the same result.

Notice that the Neutral Vertex bit (0x8) of "VtxStatus" is ALWAYS 0 because it refers to the best vertex which is never the neutral one.

### Cal energy discrepancy

#### Cal calibration runs