Scanning around cracks

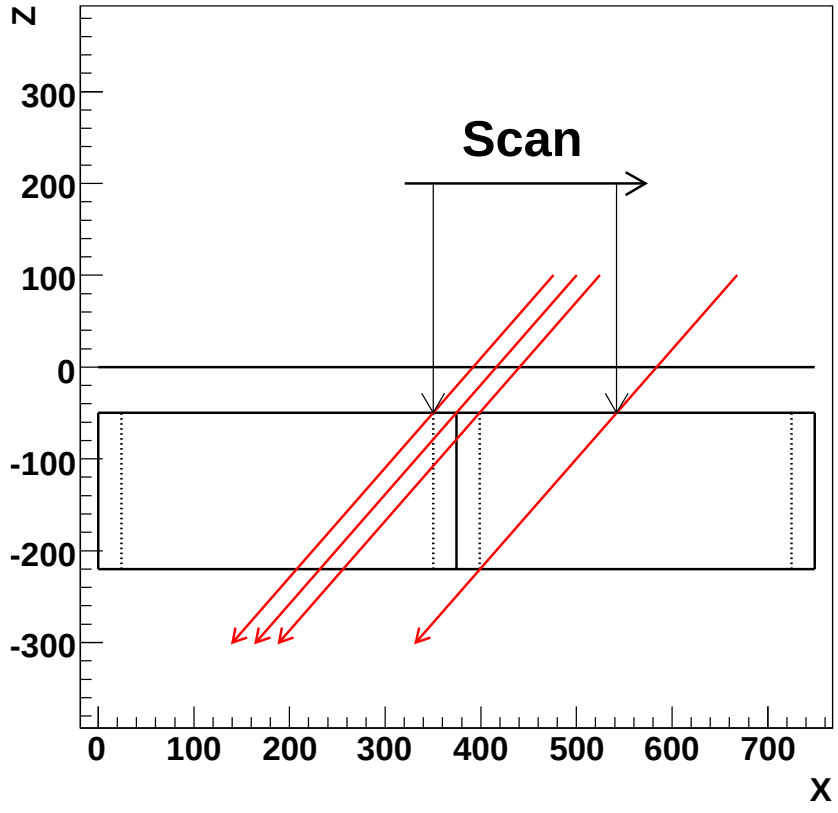
- looking at how things change around cracks
- especially efficiencies
- in order to define beam test configurations

1mm radius electron simulation based on GlastRelease v8r0 but with CalRecon corrected for :

- CU geometry;
- new event axis defi nition for the parametric method.

From where to where ?

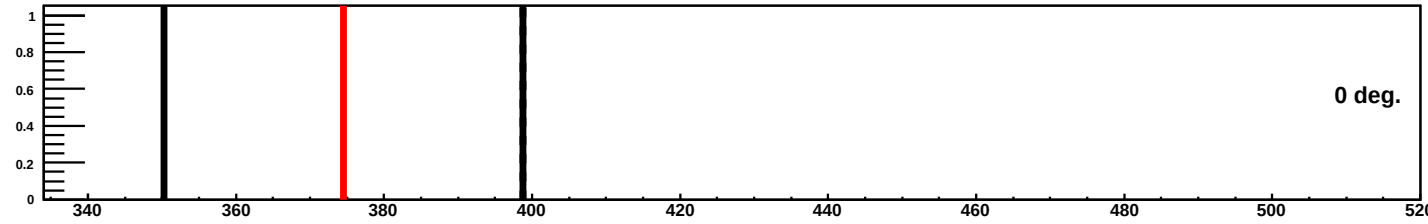
- from the last complete trajectory into CsI
  on the left hand side of the crack : calorimeter left top
- to the fi rst complete trajectory into CsI
  on the right hand side of the crack : calorimeter right bottom



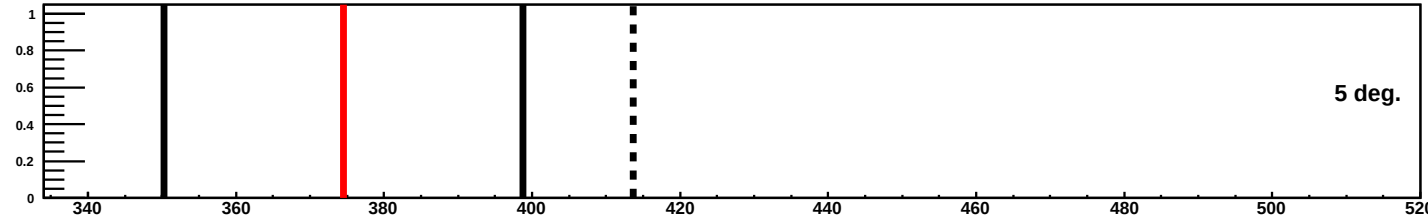
depends on the incidence angle

Scan along X description

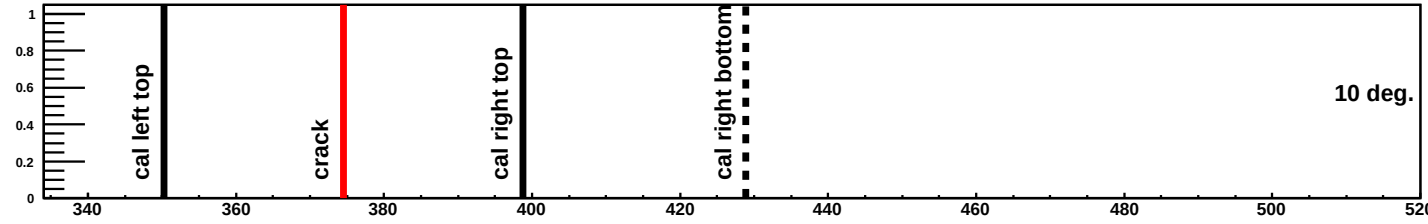
0 deg.



5 deg.



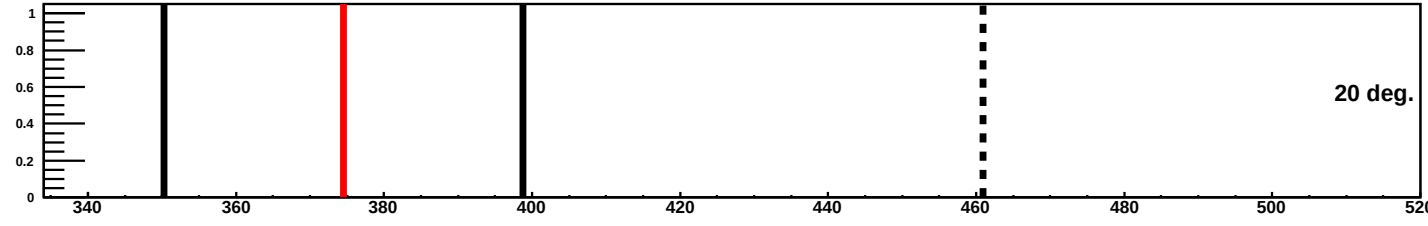
10 deg.



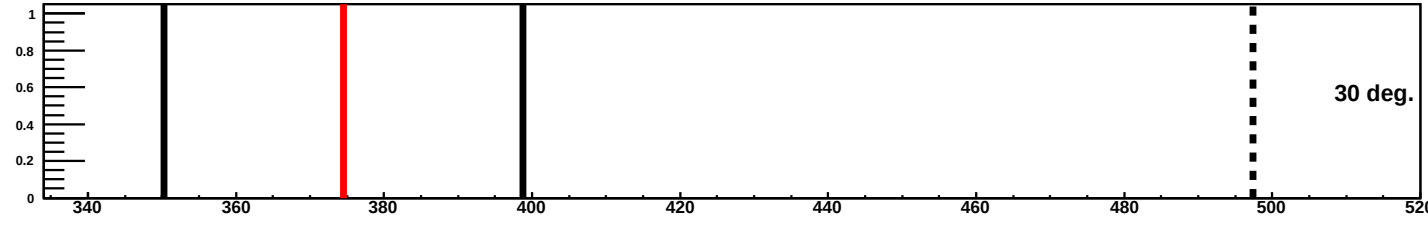
1 GeV

10 GeV

20 deg.

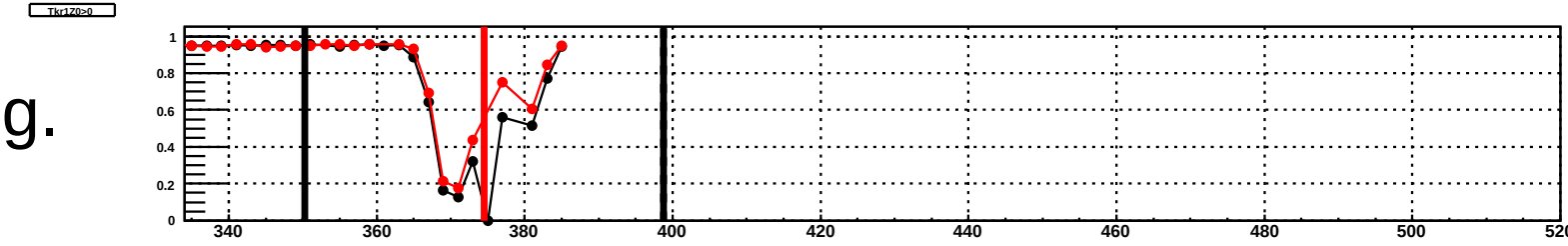


30 deg.

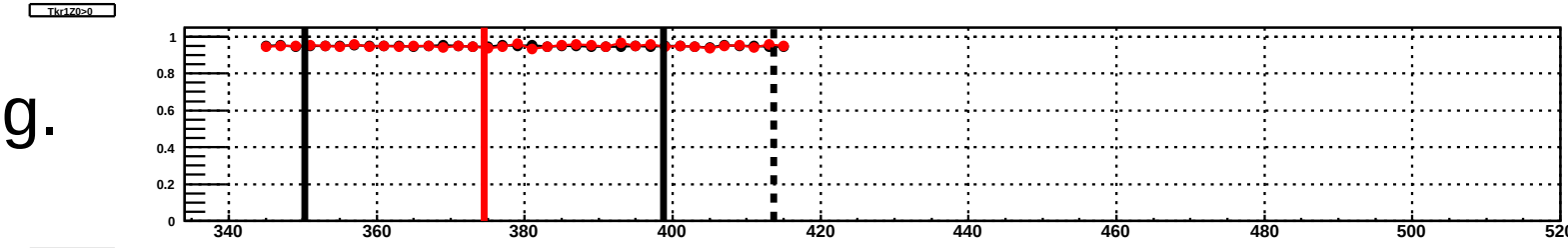


Fraction of events with Tkr1Z0>0

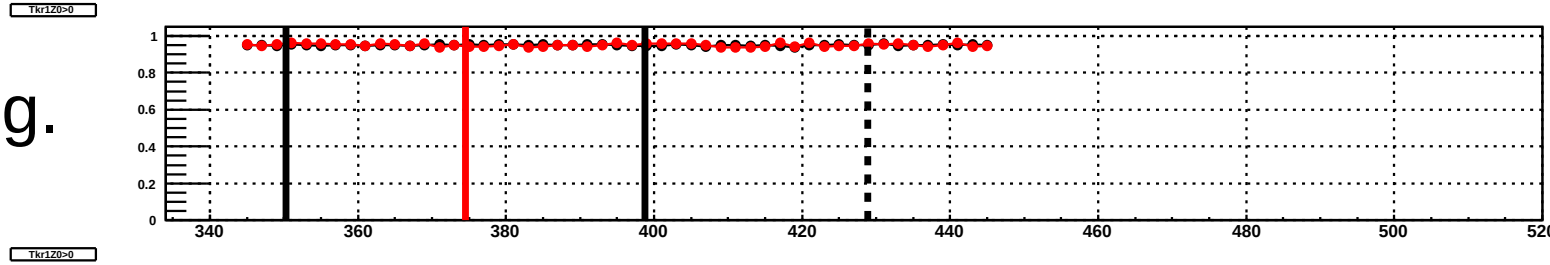
0 deg.



5 deg.



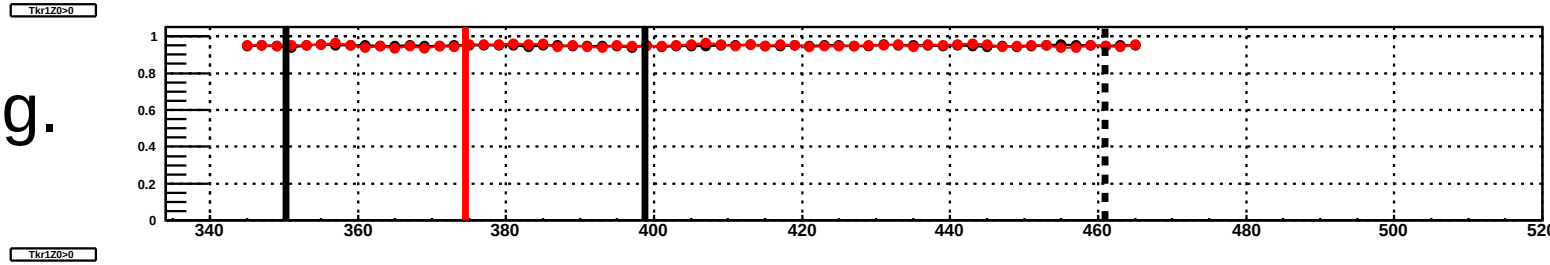
10 deg.



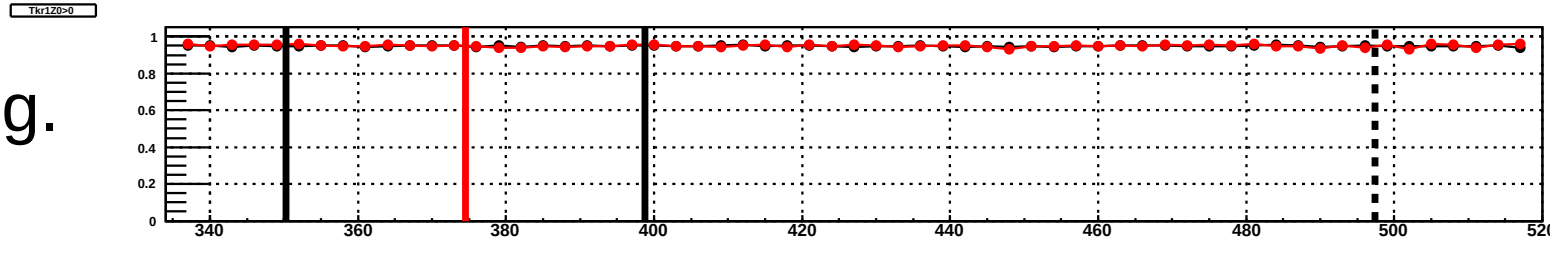
1 GeV

10 GeV

20 deg.

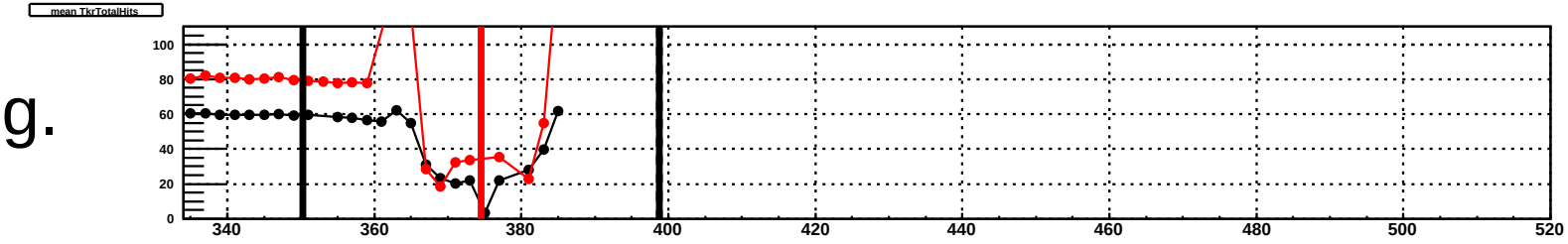


30 deg.

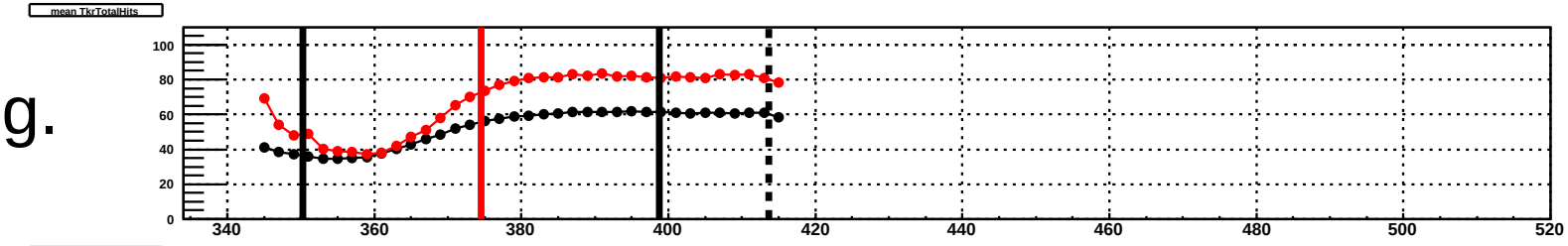


TkrTotalHits average

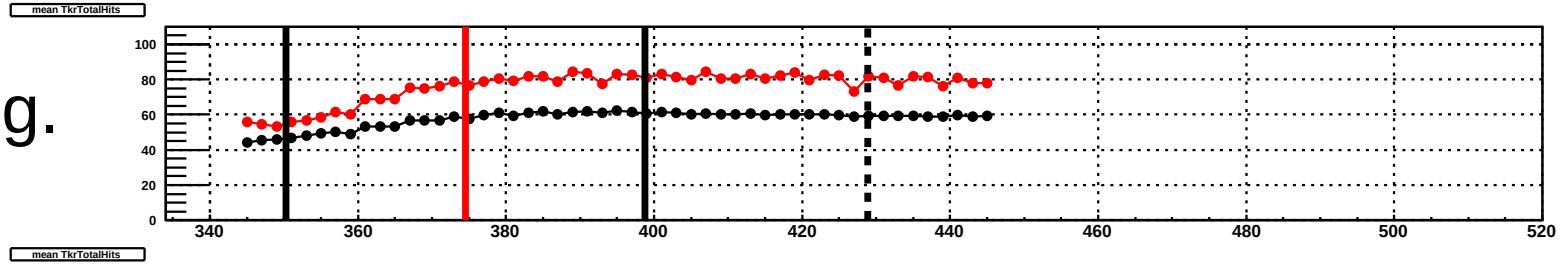
0 deg.



5 deg.



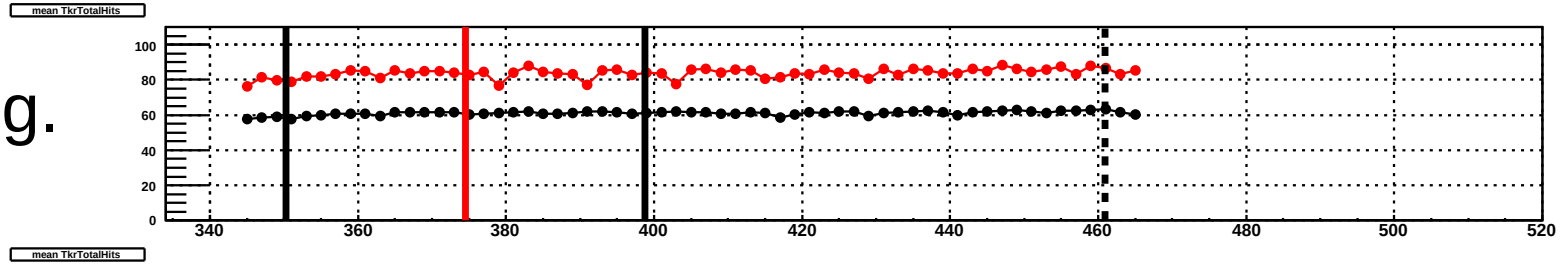
10 deg.



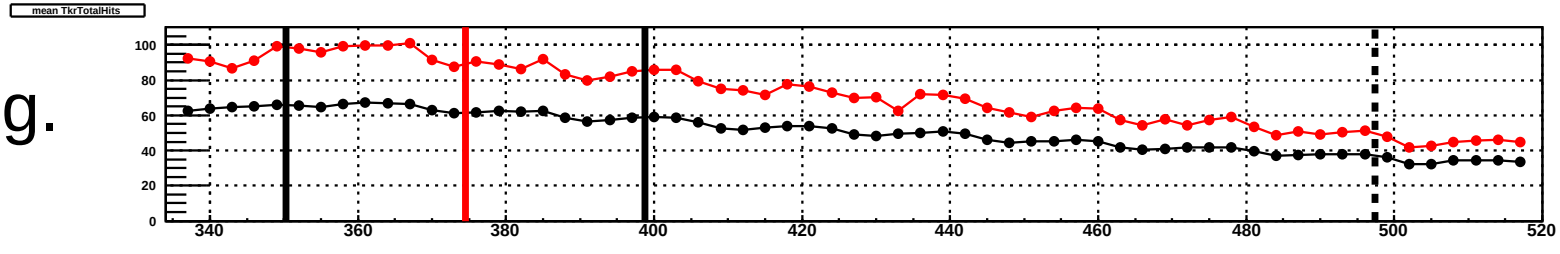
1 GeV

10 GeV

20 deg.

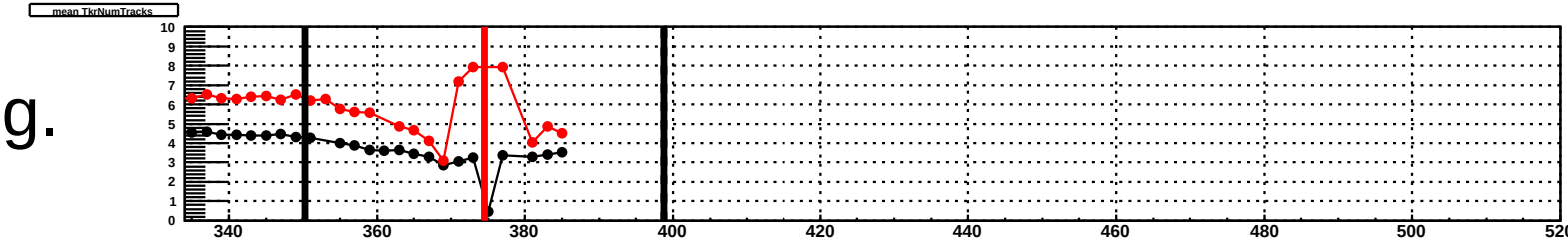


30 deg.

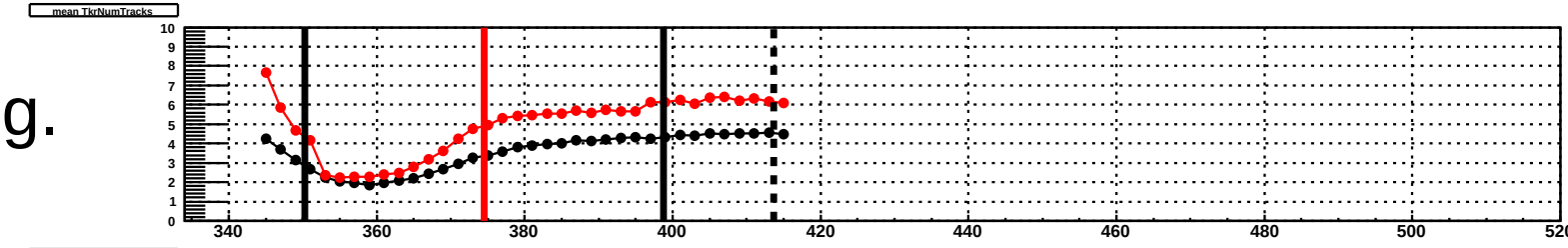


TkrNumTracks average

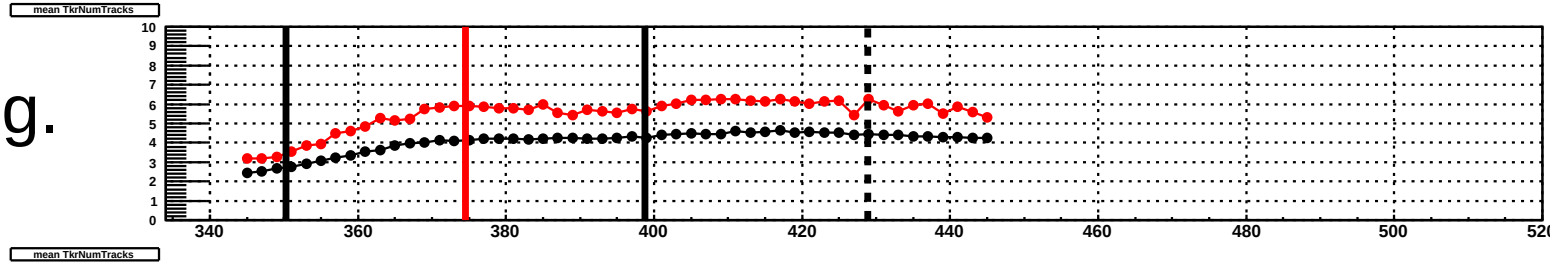
0 deg.



5 deg.



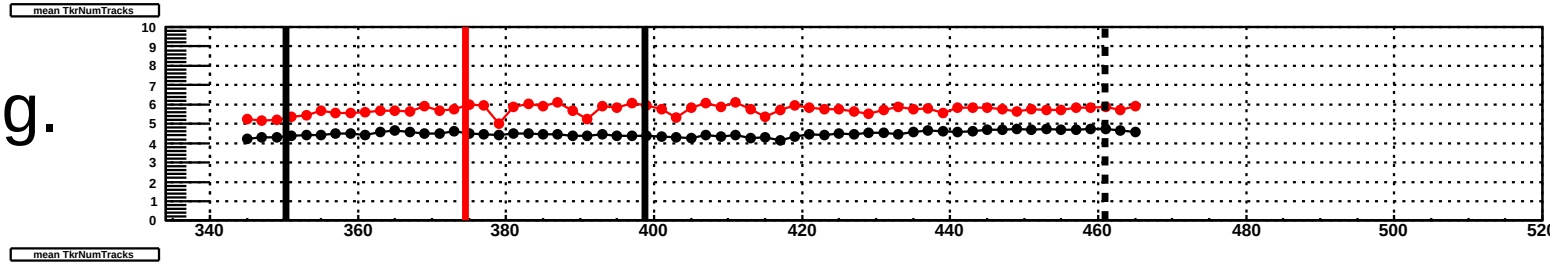
10 deg.



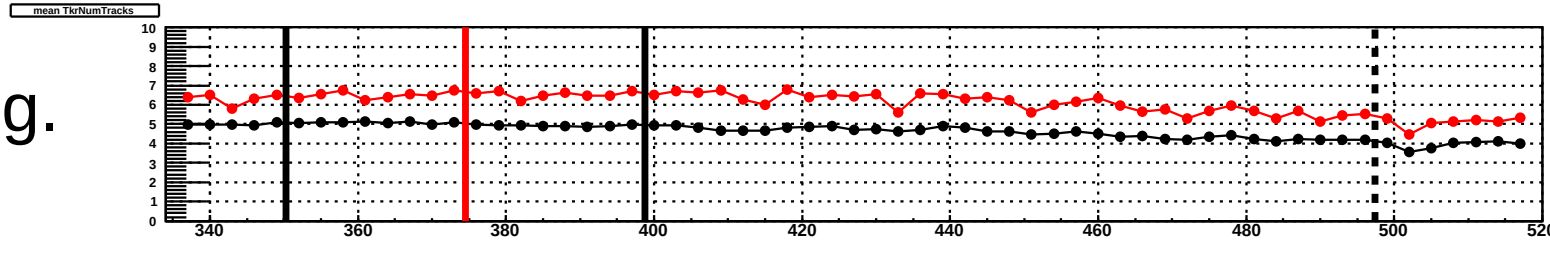
1 GeV

10 GeV

20 deg.

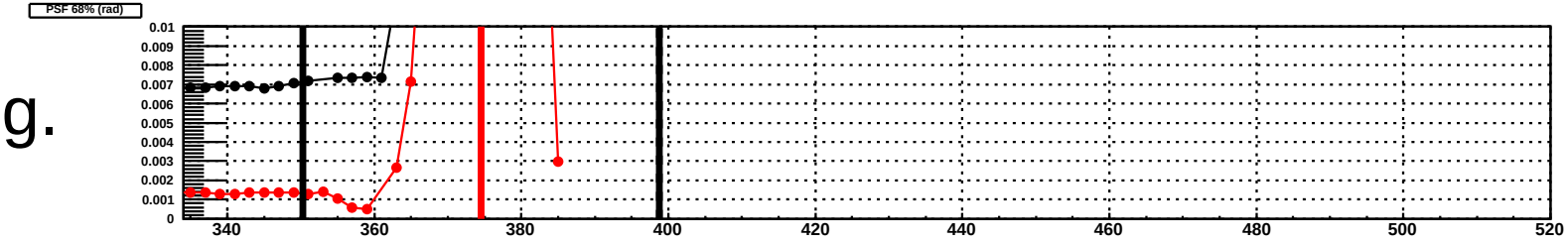


30 deg.

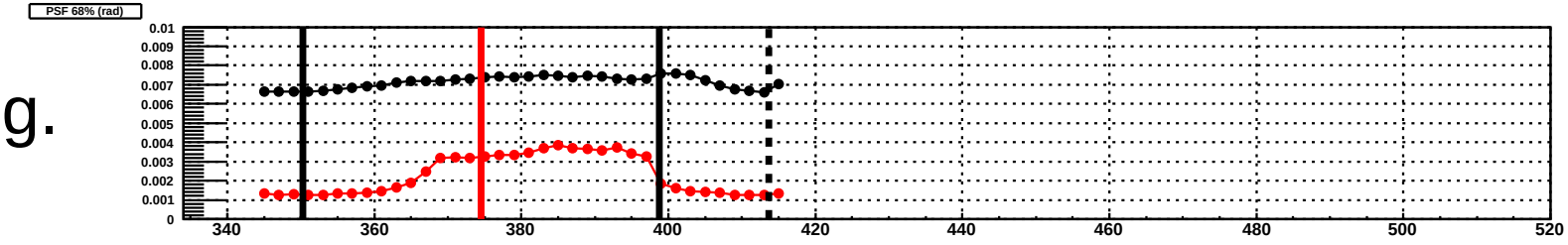


PSF 68%

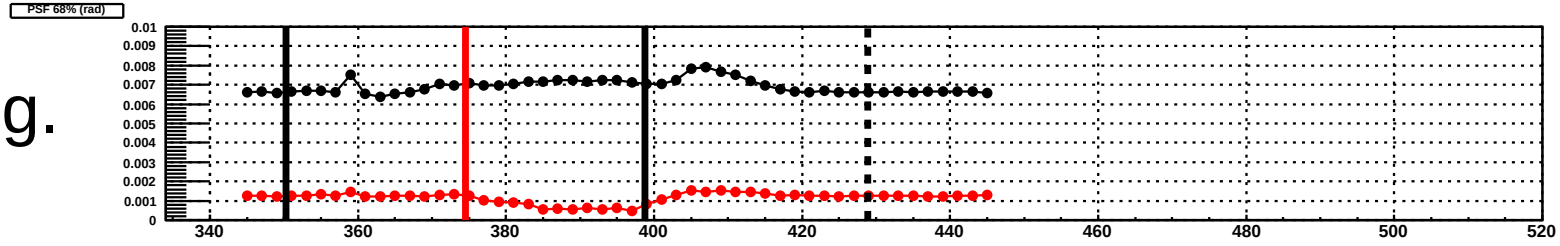
0 deg.



5 deg.



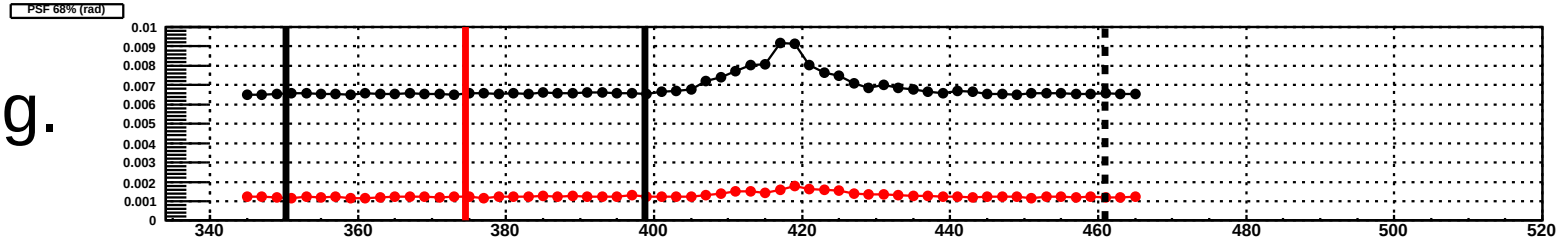
10 deg.



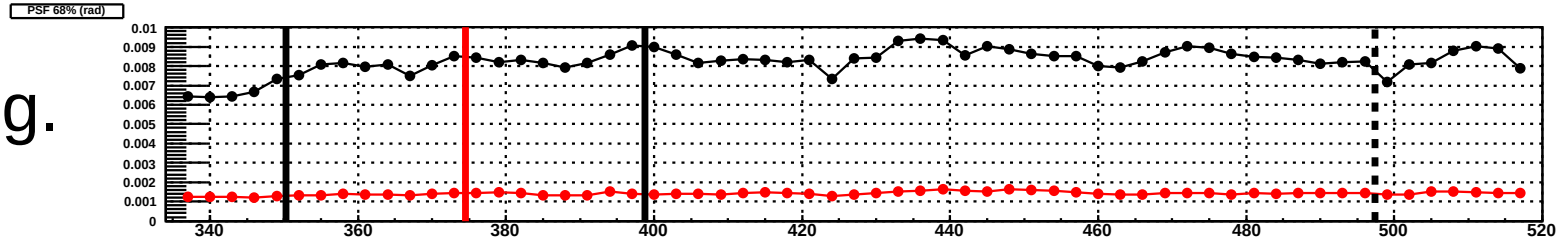
1 GeV

10 GeV

20 deg.

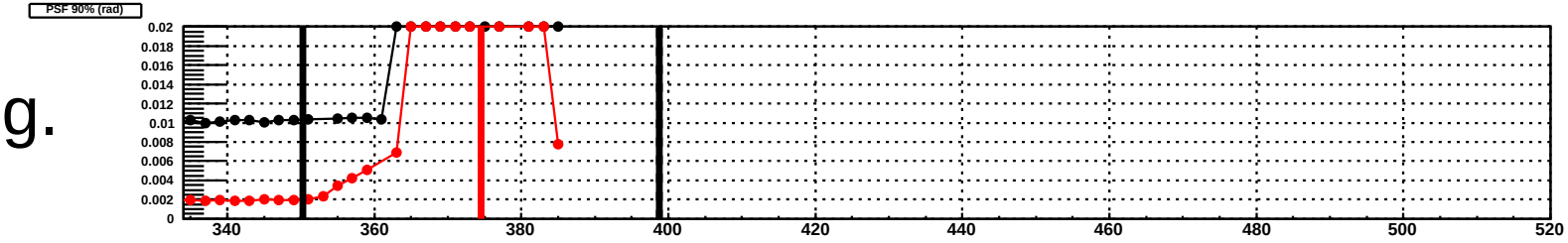


30 deg.

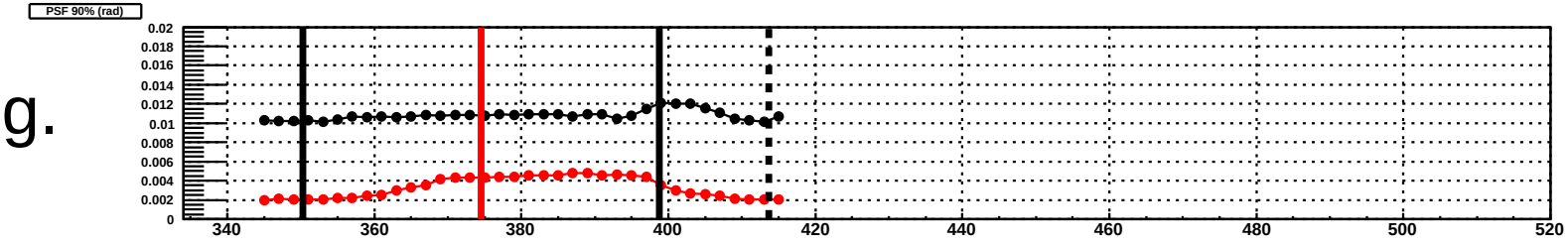


PSF 90%

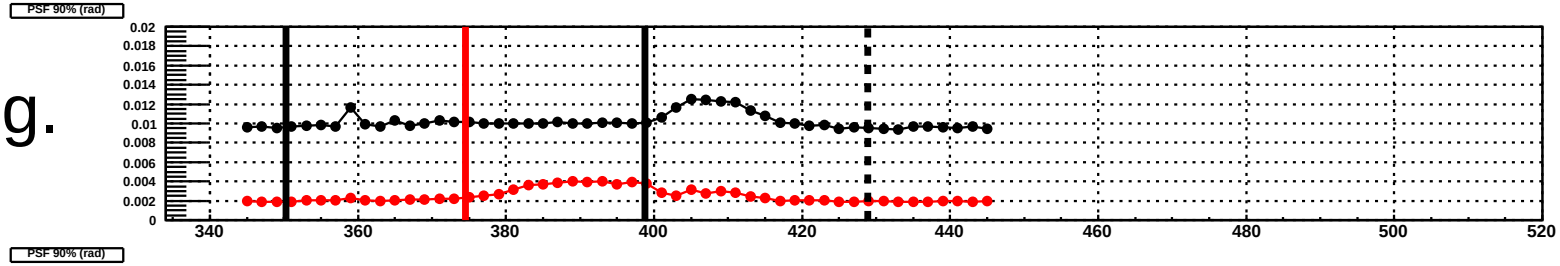
0 deg.



5 deg.



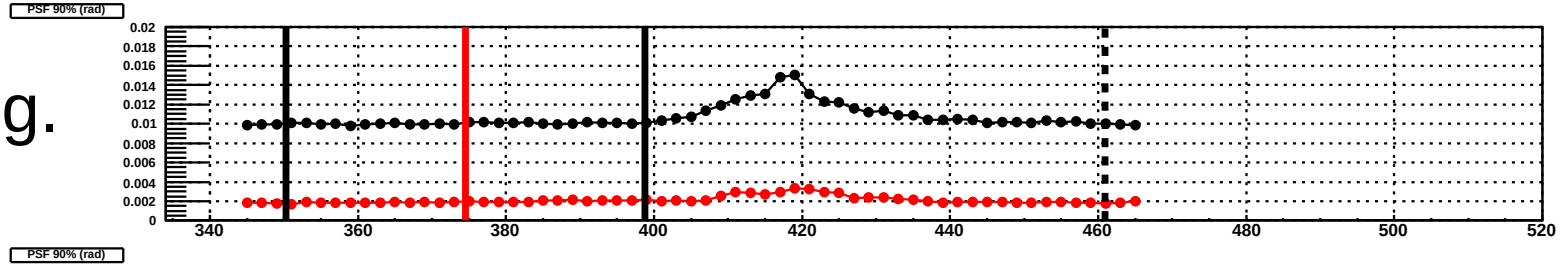
10 deg.



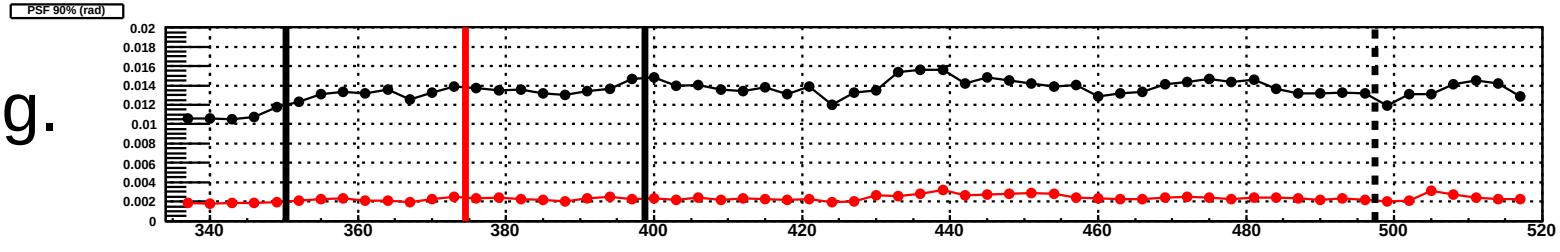
1 GeV

10 GeV

20 deg.



30 deg.

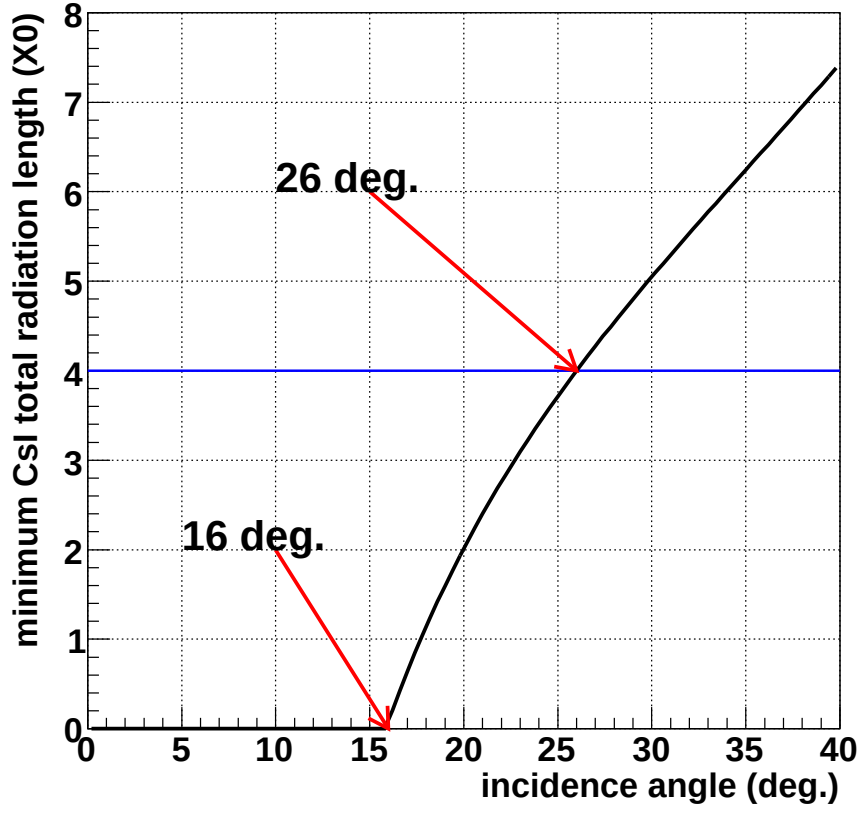


Tracker point of view

- things are rather constant
- except at 0 deg inside the crack (|374.5-x|<15)
- and at 5 deg and 10 GeV (the PSF gets larger)

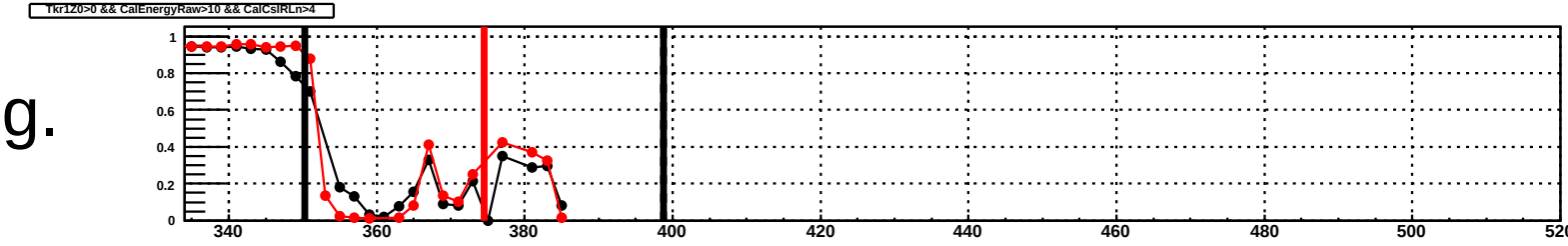
X0 point of view

- from 0 to 16 deg : crack can lead to 0 X0
- above 26 deg : always more than 4 X0

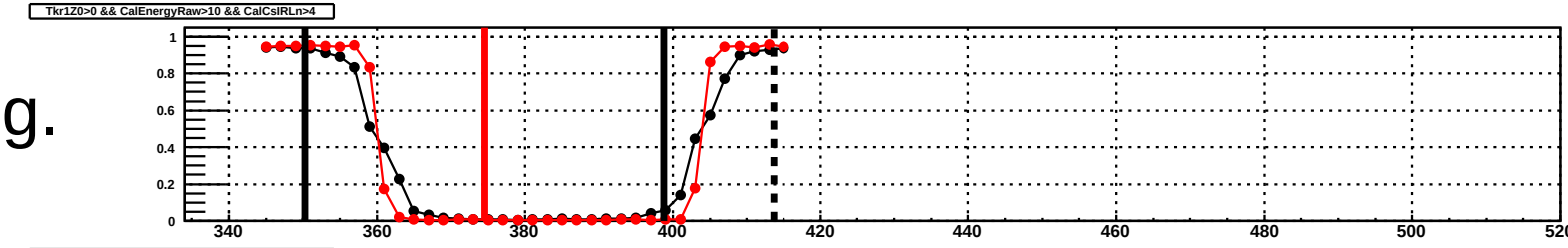


Tkr1Z0>0 ++ CalEnergyRaw>10 ++ CalCsIRLn>4

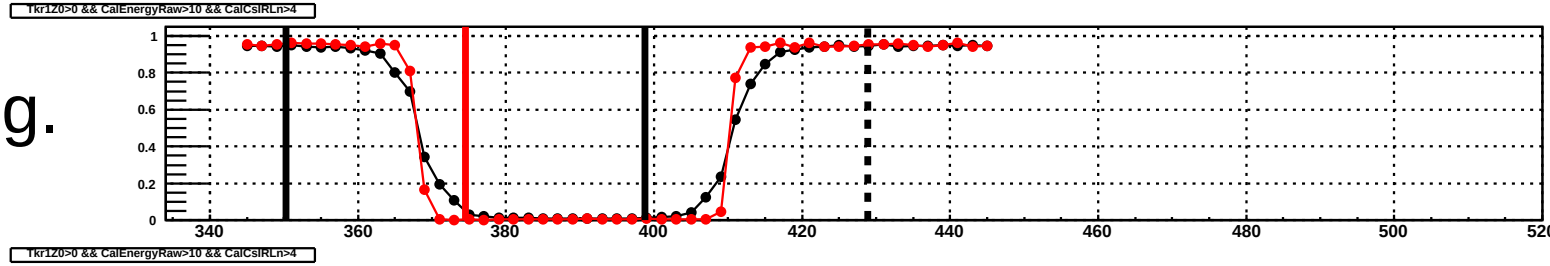
0 deg.



5 deg.



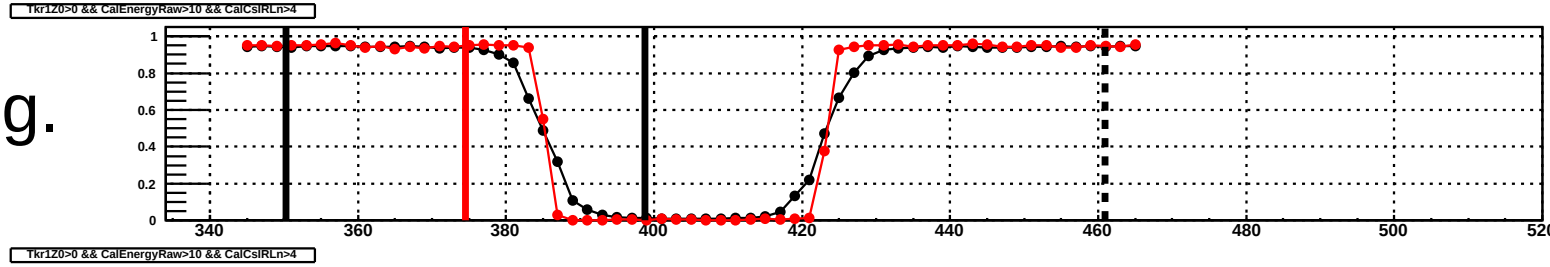
10 deg.



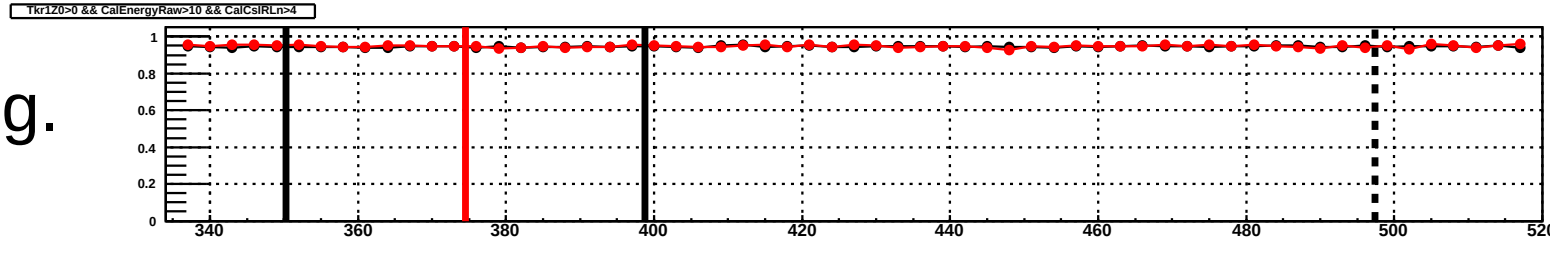
1 GeV

10 GeV

20 deg.



30 deg.



Energy reconstruction efficiency

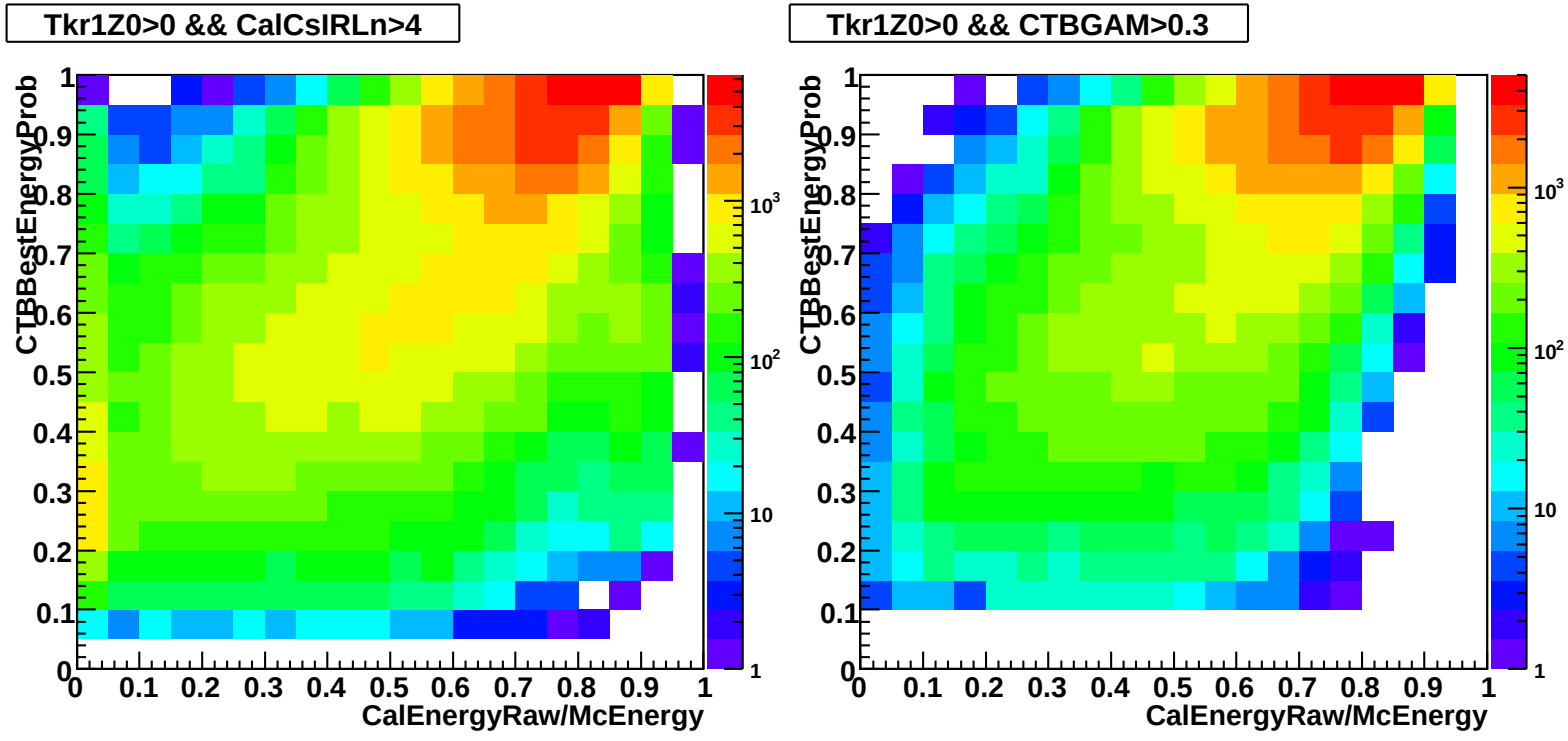
- the energy reconstruction Classifi cation Tree analysis compares each algorithm to the same resolution model;
- CTBBestEnergyProb>0.5 selects events for which CTBBestEnergy/McEnergy is within $[1 - 2\sigma_{model}, 1 + 2\sigma_{model}]$ more than half of the time

$\Rightarrow$ for each algorithm we should look to the fraction of events for which: AlgorithmEnergy/McEnergy is within $[1 - 0.2, 1 + 0.2]$

CTBBestEnergyProb

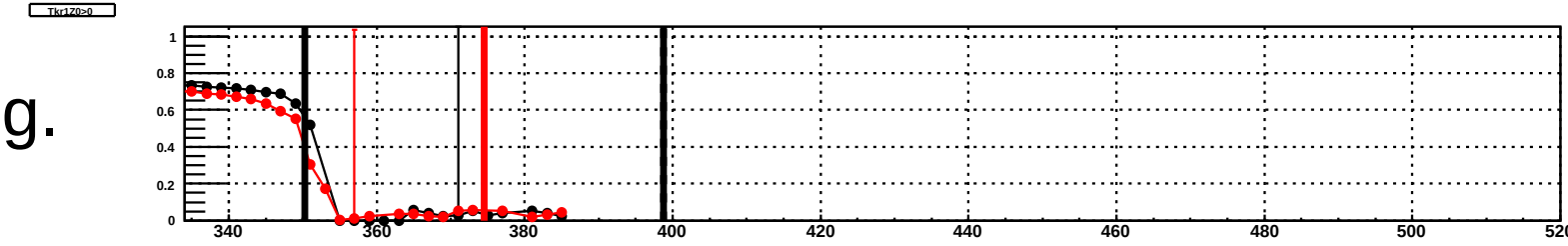
- CTBBestEnergyProb is correlated with CalEnergyRaw/McEnergy (allGamma-GR-v9r6-full-merit.root)

$\Rightarrow$ we should look at the variation of CalEnergyRaw/McEnergy

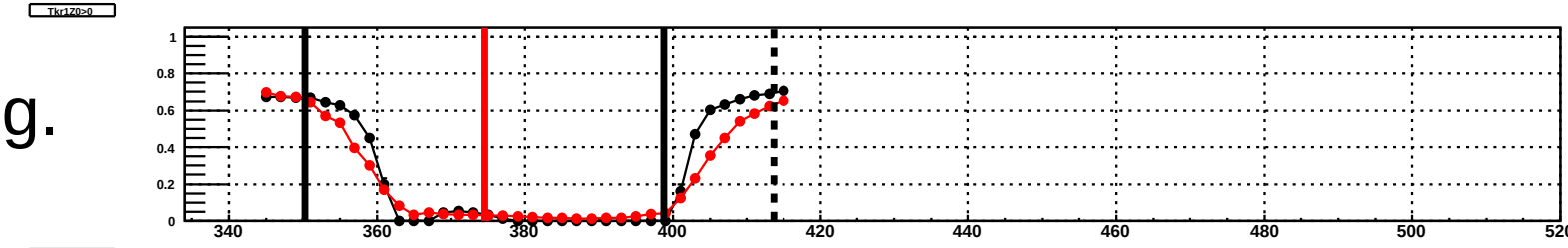


CalEnergyRaw average

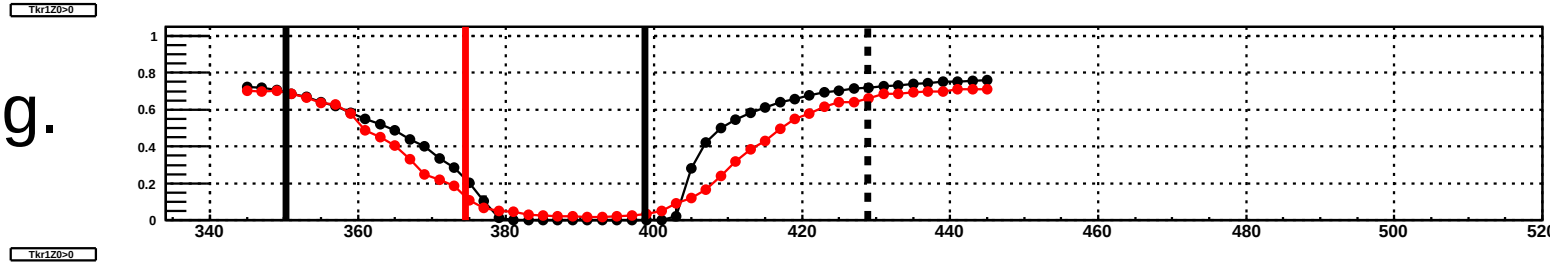
0 deg.



5 deg.



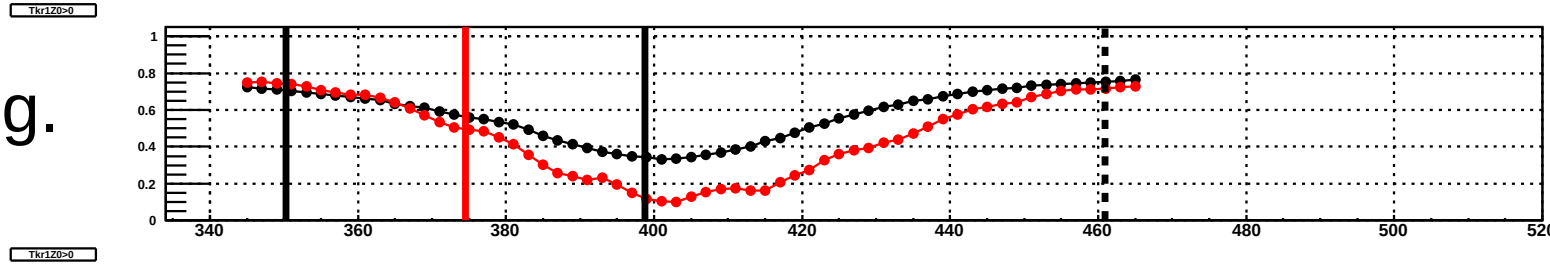
10 deg.



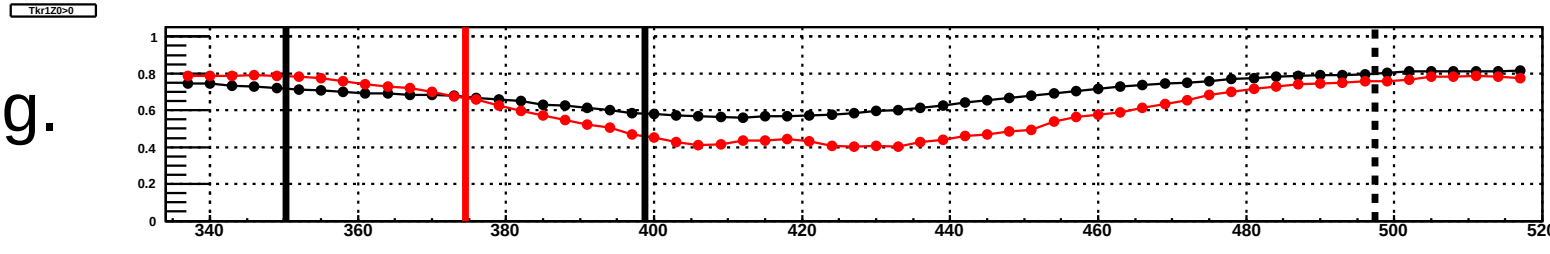
1 GeV

10 GeV

20 deg.

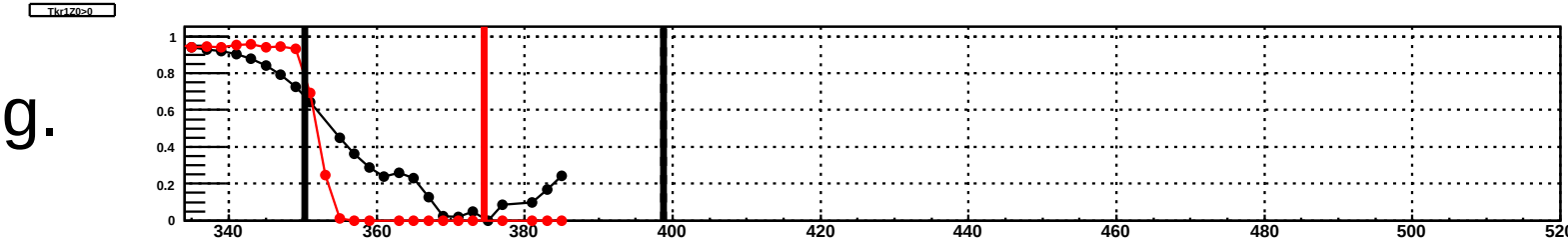


30 deg.

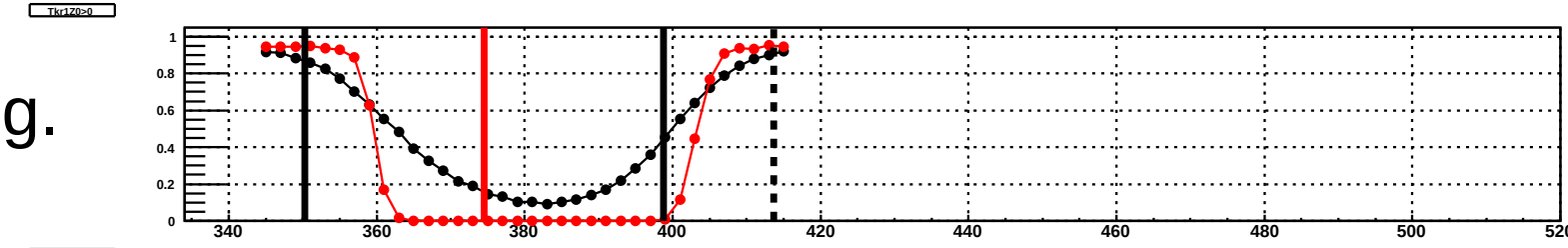


CalEnergyRaw/McEnergy>0.25 fraction

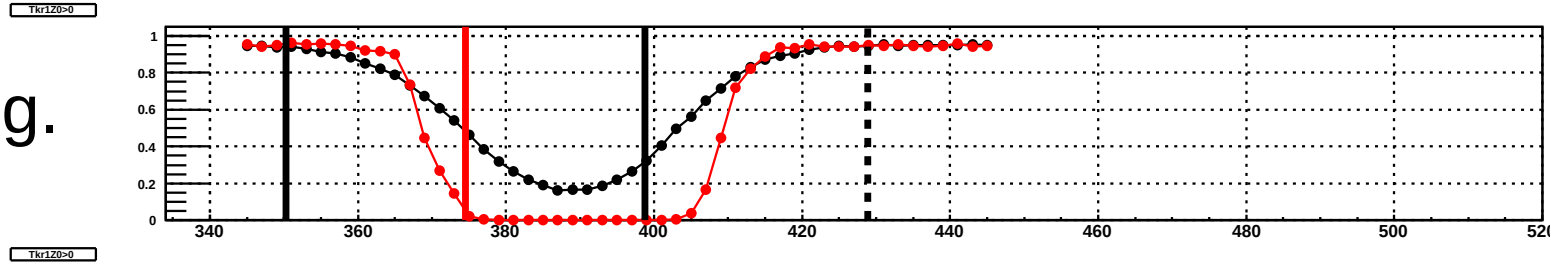
0 deg.



5 deg.



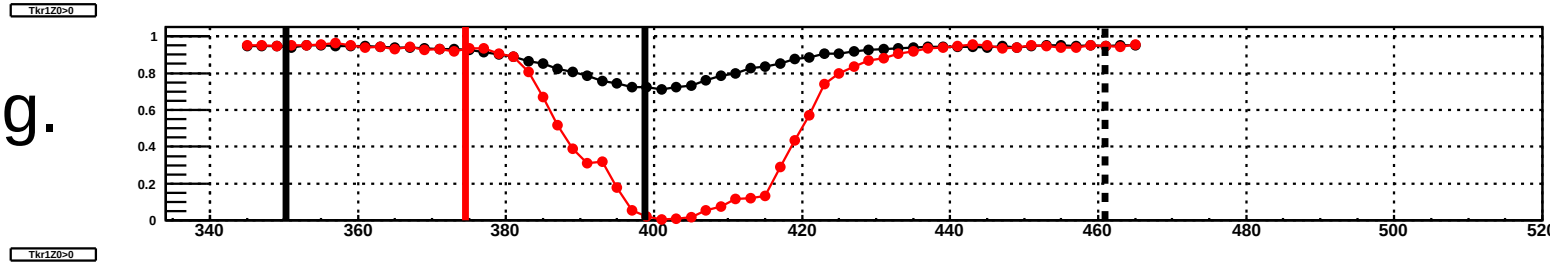
10 deg.



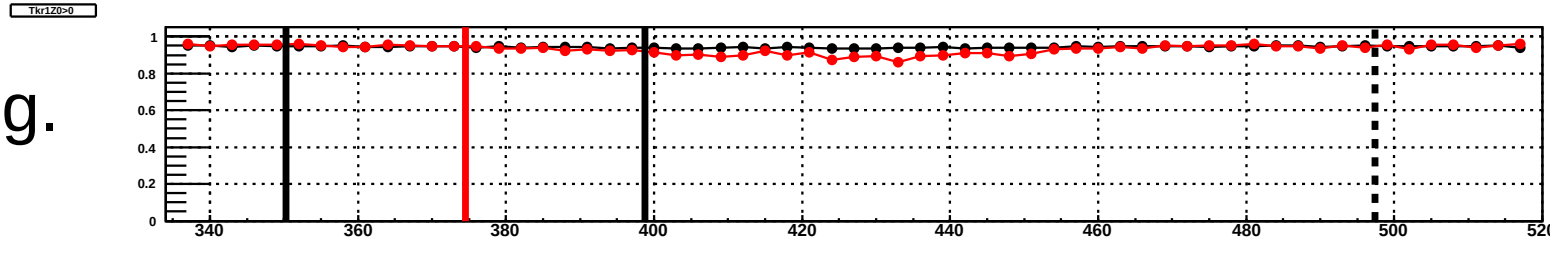
1 GeV

10 GeV

20 deg.

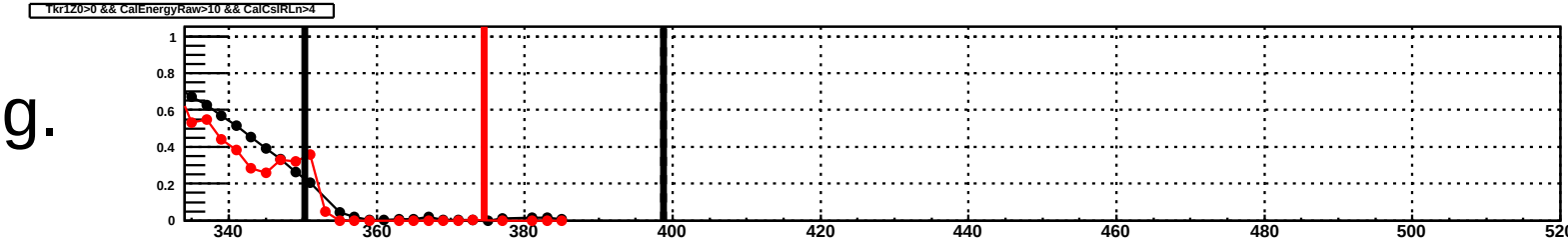


30 deg.

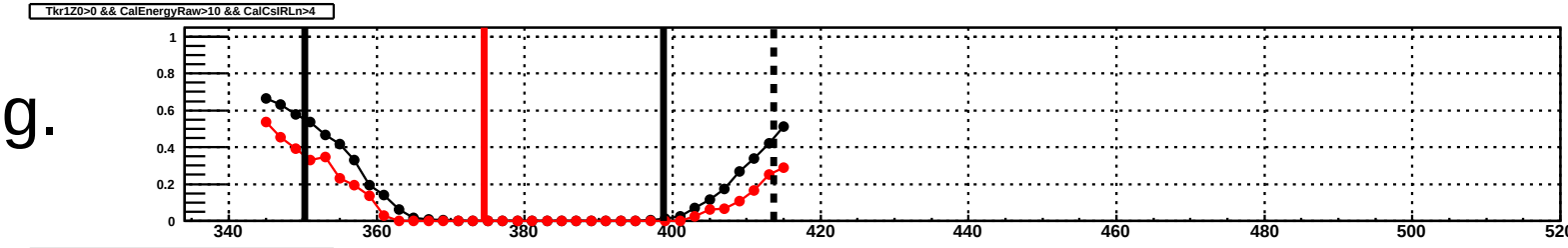


|EvtEnergyCorr/McEnergy-1|<0.2 fraction

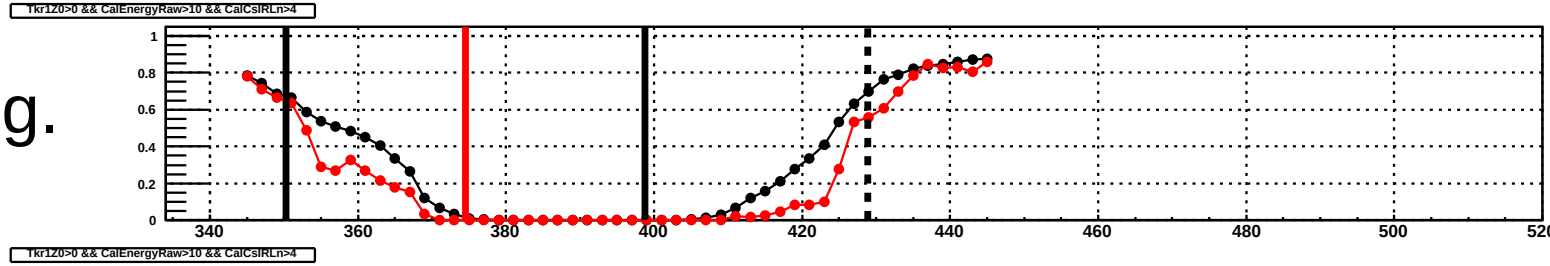
0 deg.



5 deg.



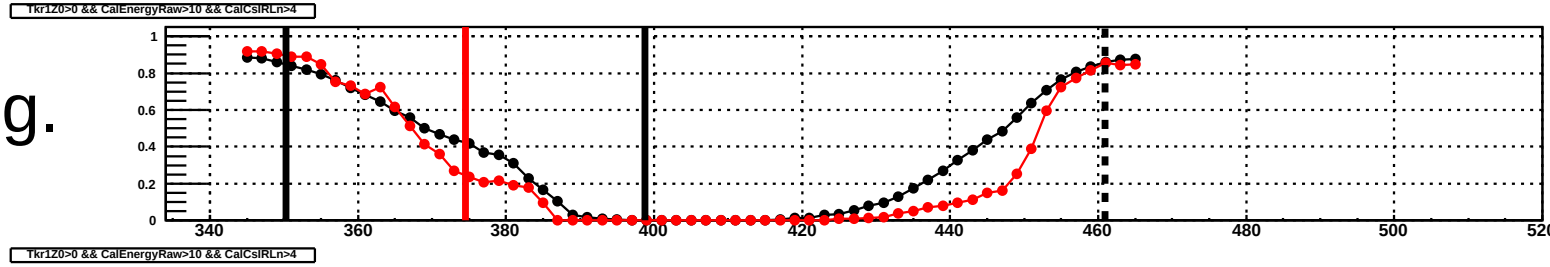
10 deg.



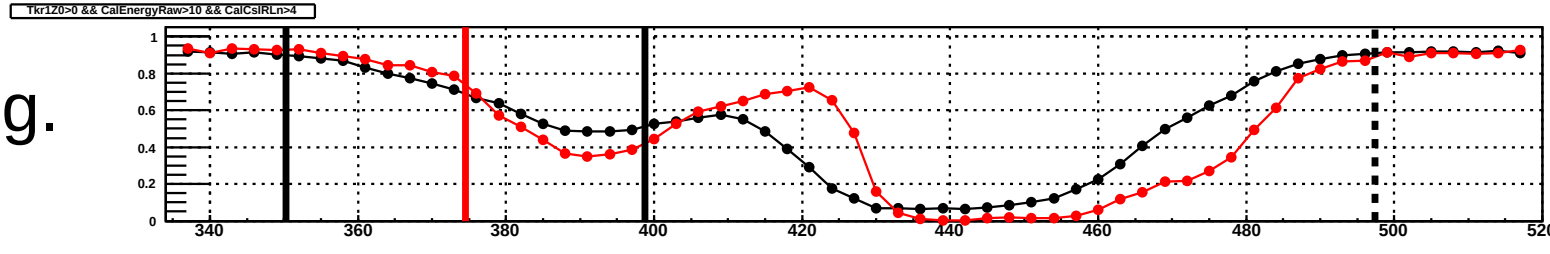
1 GeV

10 GeV

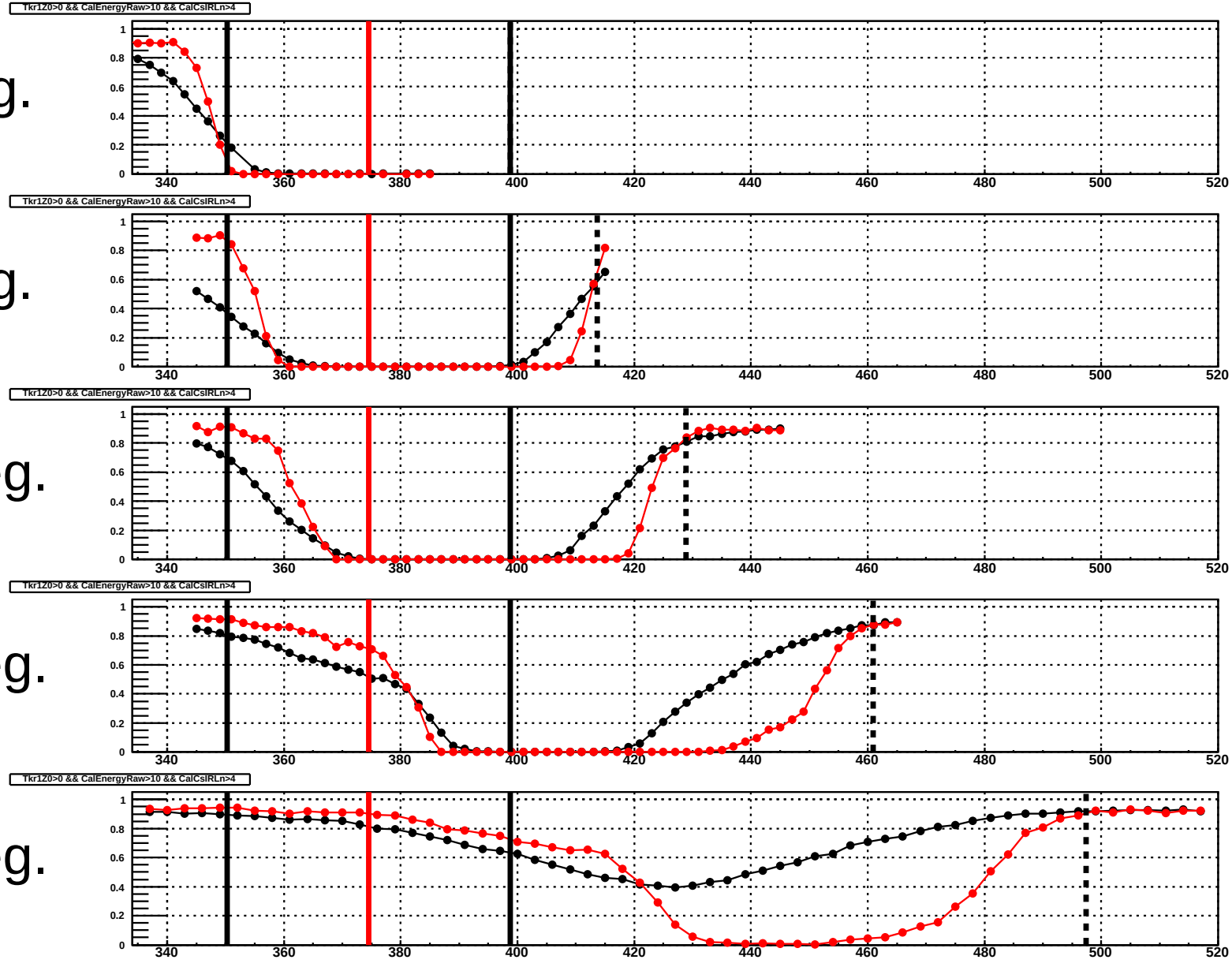
20 deg.



30 deg.

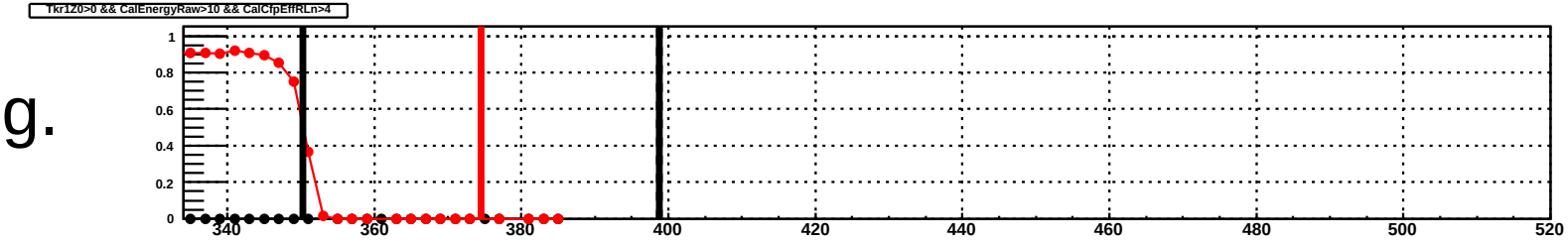


|CalLkHdEnergy/McEnergy-1|<0.2 fraction

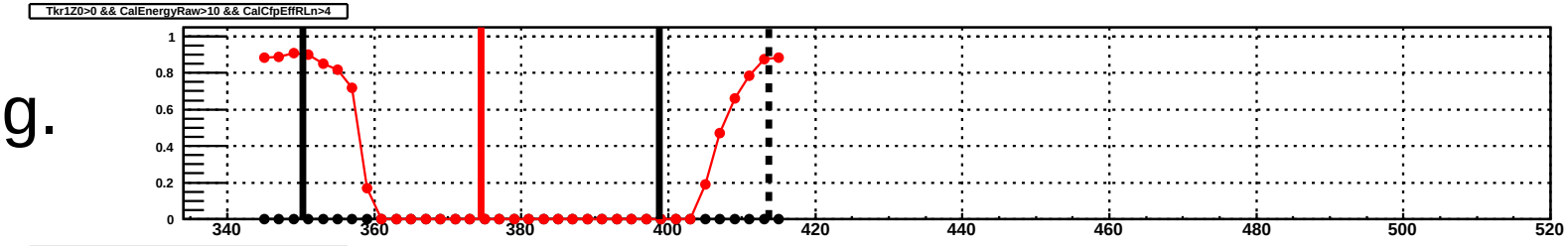


|CalCfpEnergy/McEnergy-1|<0.2 fraction

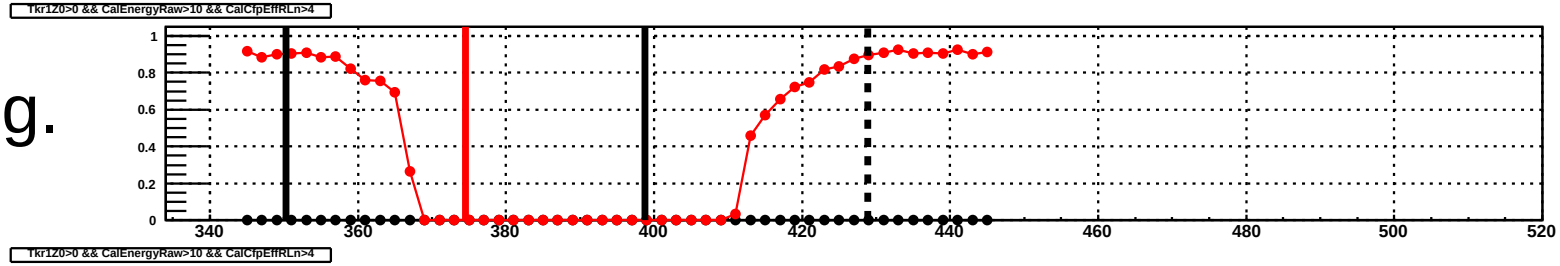
0 deg.



5 deg.



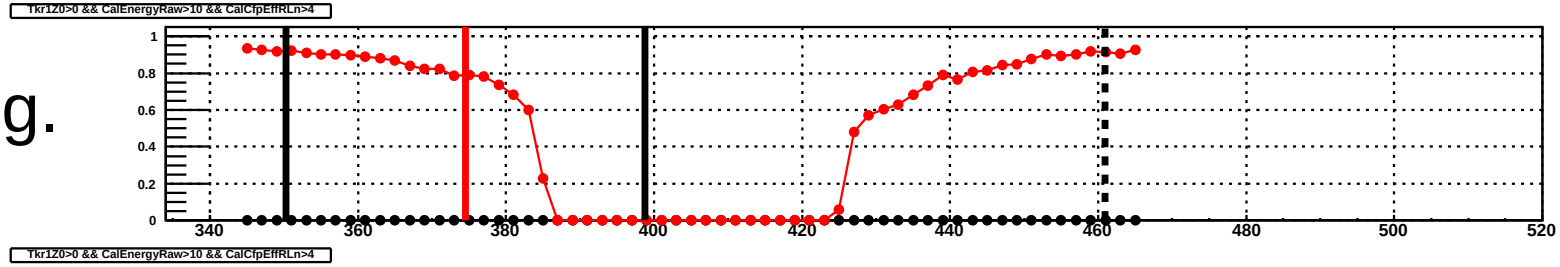
10 deg.



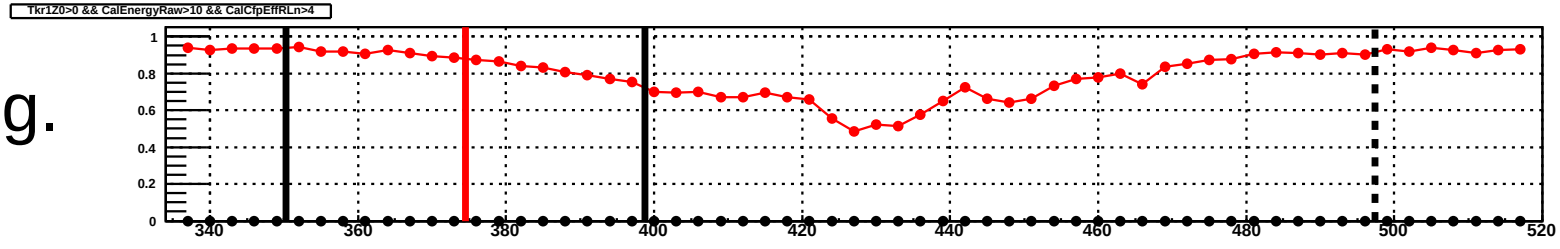
1 GeV

10 GeV

20 deg.



30 deg.



Conclusions

almost always the same pattern : almost a symetric decrease between the cal left top confi guration and the cal right bottom confi guration

$\Rightarrow$ testing the following confi gurations :

- cal left top
- cal right bottom
- in the middle of them
- and at least two other ones in order to check :
  - the decreasing edge
  - the increasing edge