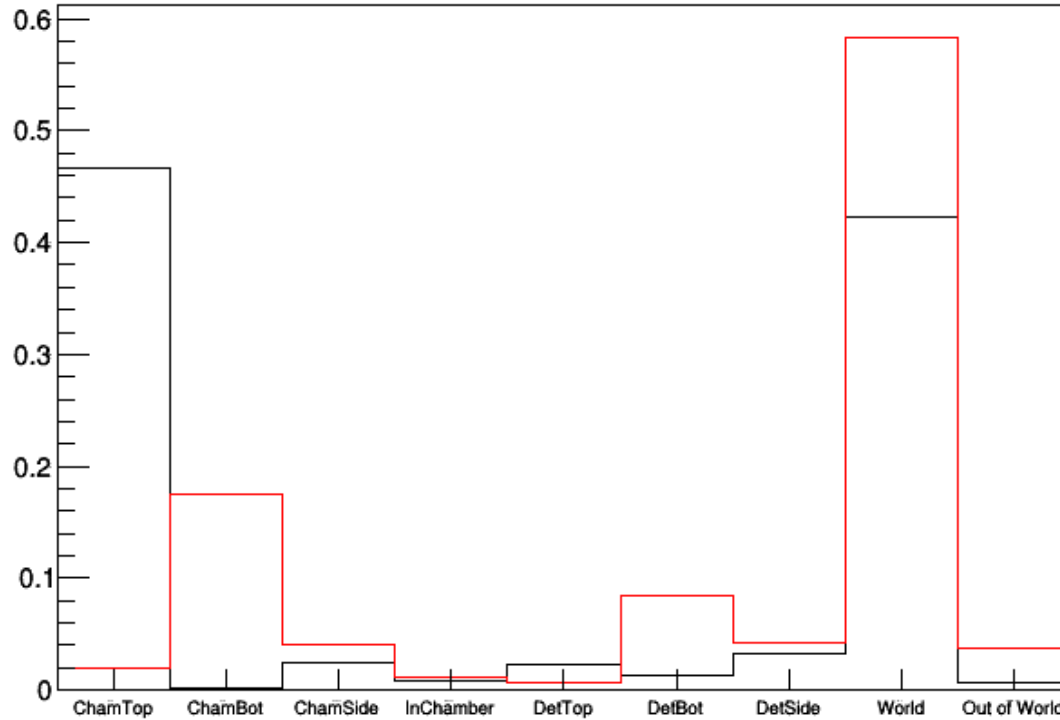


Pion Stopping position



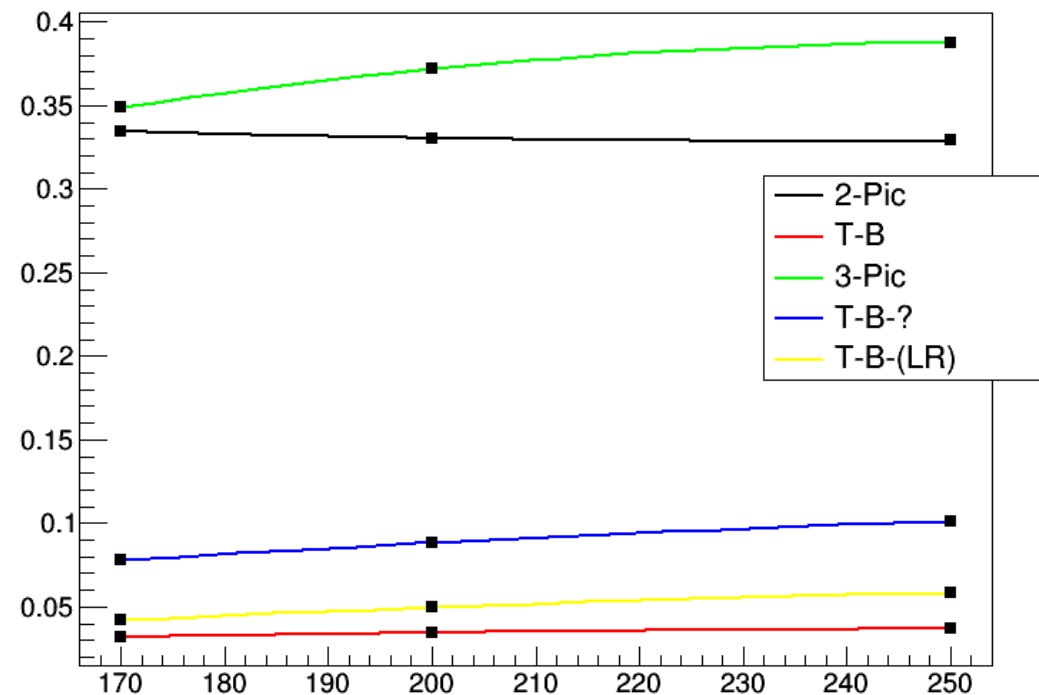
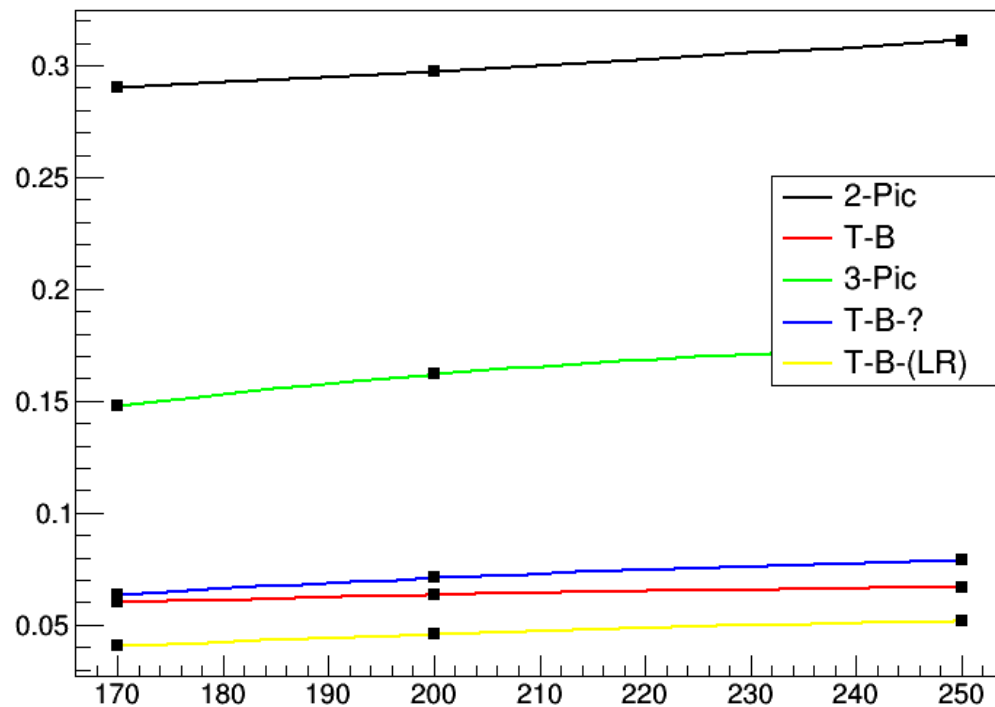
Pion Stopping Position

```
root [0]
Attaching file pbar_825_up_ana.root as _file0...
(TFile *) 0x361b7f0
root [1] .ls
TFile**          pbar_825_up_ana.root
TFile*           pbar_825_up_ana.root
KEY: TH1F        hPicStop;1          Pic Stop
root [2] hPicStop->Draw()
Info in <TCanvas::MakeDefCanvas>: created default canvas
root [3] hPicStop->Print()
TH1.Print Name = hPicStop, Entries= 145860, Total = 145860
root [4] hPicStop->Print("all")
TH1.Print Name = hPicStop, Entries= 145860, Total = 145860
fSumw[0]=0, x=-1
fSumw[1]=68034, x=0
fSumw[2]=401, x=1
fSumw[3]=3530, x=2
fSumw[4]=1125, x=3
fSumw[5]=3463, x=4
fSumw[6]=1828, x=5
fSumw[7]=4840, x=6
fSumw[8]=61634, x=7
fSumw[9]=1005, x=8
fSumw[10]=0, x=9
```

```
root@localhost:/data/kgbar_sim/root/ana
파일(F) 편집(E) 보기(V) 검색(S) 터미널(T) 도움말(H)
TH1.Print Name = pionstop_up, Entries= 145860, Total = 145860
fSumw[0]=0, x=0
fSumw[1]=68034, x=1
fSumw[2]=401, x=2
fSumw[3]=3530, x=3
fSumw[4]=1125, x=4
fSumw[5]=3463, x=5
fSumw[6]=1828, x=6
fSumw[7]=4840, x=7
fSumw[8]=61634, x=8
fSumw[9]=1005, x=9
fSumw[10]=0, x=10
TH1.Print Name = pionstop_down, Entries= 146041, Total = 146041
fSumw[0]=0, x=0
fSumw[1]=2821, x=1
fSumw[2]=25484, x=2
fSumw[3]=5936, x=3
fSumw[4]=1752, x=4
fSumw[5]=894, x=5
fSumw[6]=12448, x=6
fSumw[7]=6114, x=7
fSumw[8]=85197, x=8
fSumw[9]=5395, x=9
fSumw[10]=0, x=10
```

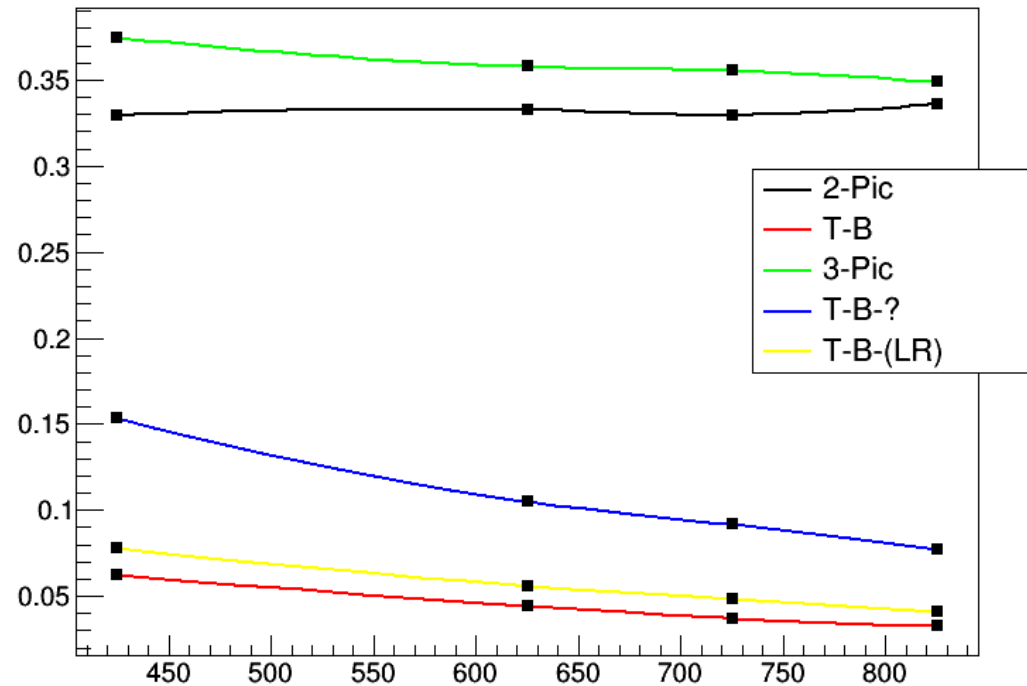
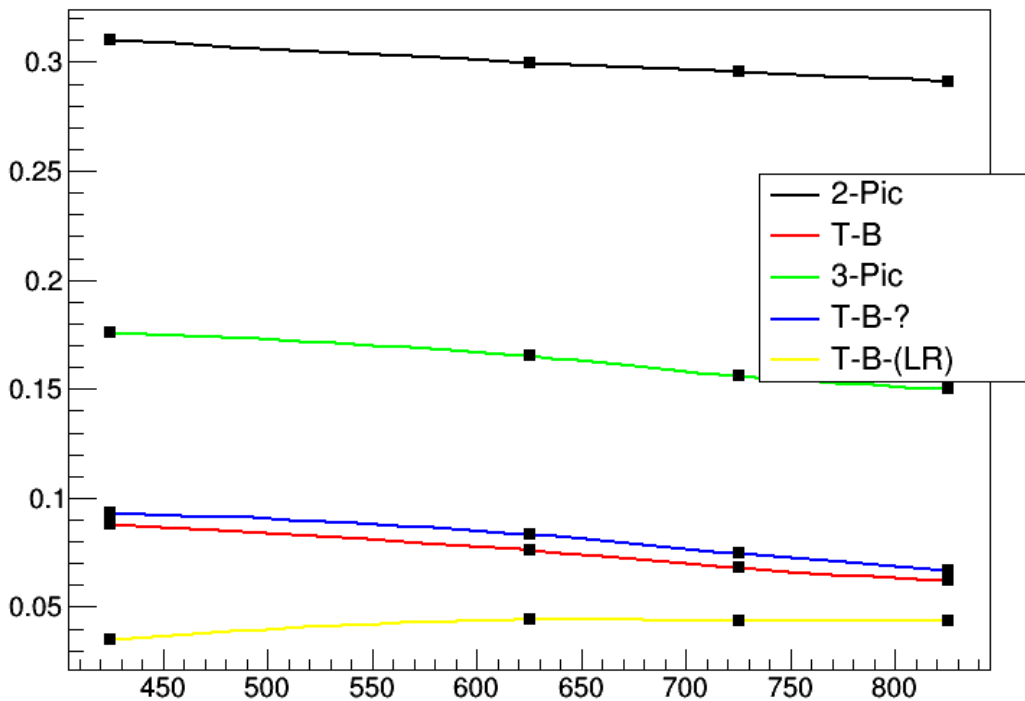
Detection efficiency

- X axis : length of scintillator
- Pion detection efficiency
$$= (\# \text{ of events satisfying the criterion}) / (\# \text{ of events})$$



Detection efficiency

- X axis : height of top TOF detector
- Pion detection efficiency



Single charged pion detection efficiency

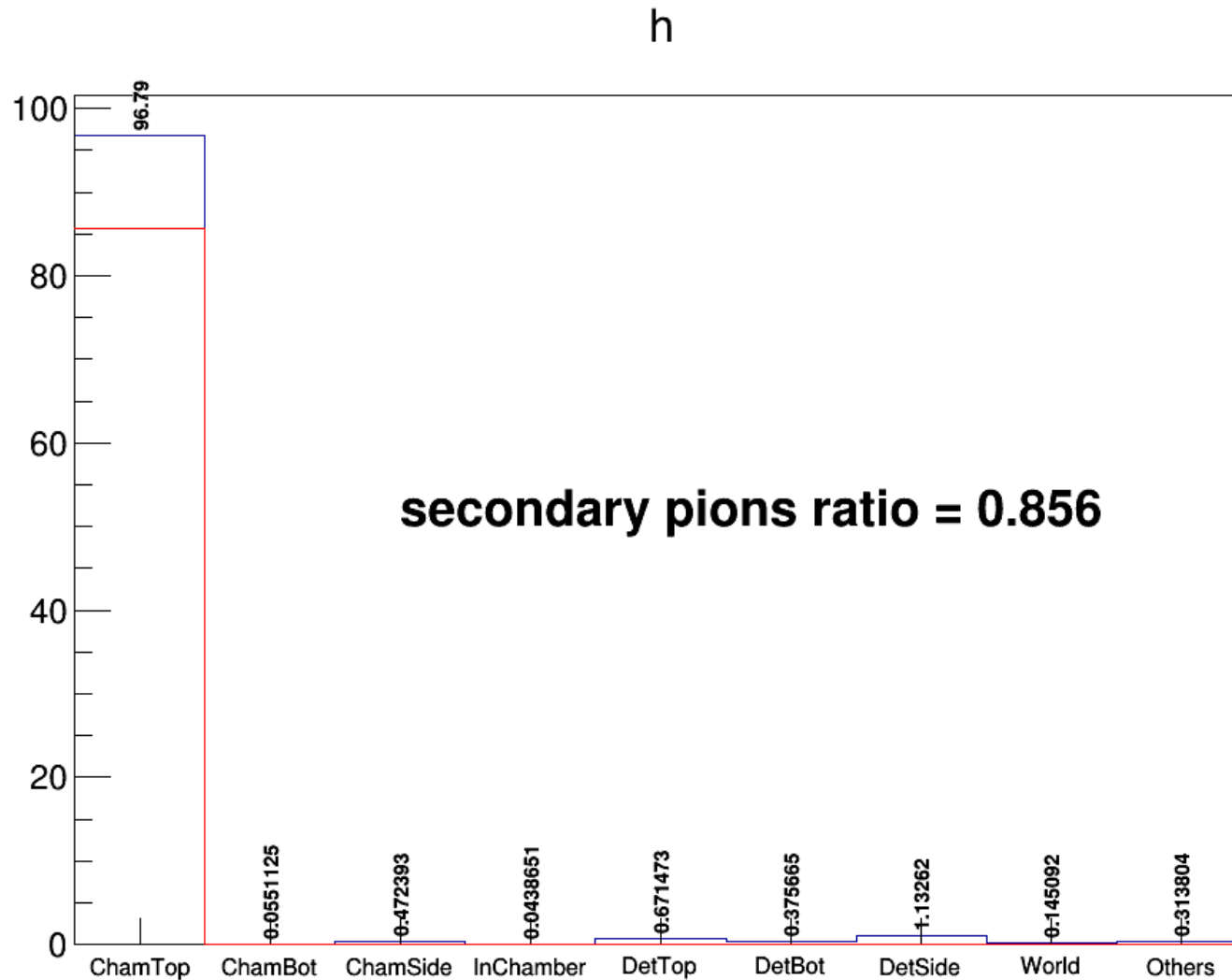
= (# of detected pions) / (# of produced pions)

height	Top Ann.	Bottom Ann.
425	0.450	0.641
625	0.436	0.627
725	0.427	0.622
825	0.420(0.424)	0.620(0.65)

material	Top Ann.	Bottom Ann.
SUS	0.419(0.424)	0.623(0.65)
Titinium	0.520(0.525)	0.674(0.709)

threshold	Top Ann.	Bottom Ann.
0	0.420(0.424)	0.620(0.65)
1	0.419(0.423)	0.620(0.65)
5	0.416(0.420)	0.616(0.646)
8	0.402(0.406)	0.604(0.633)

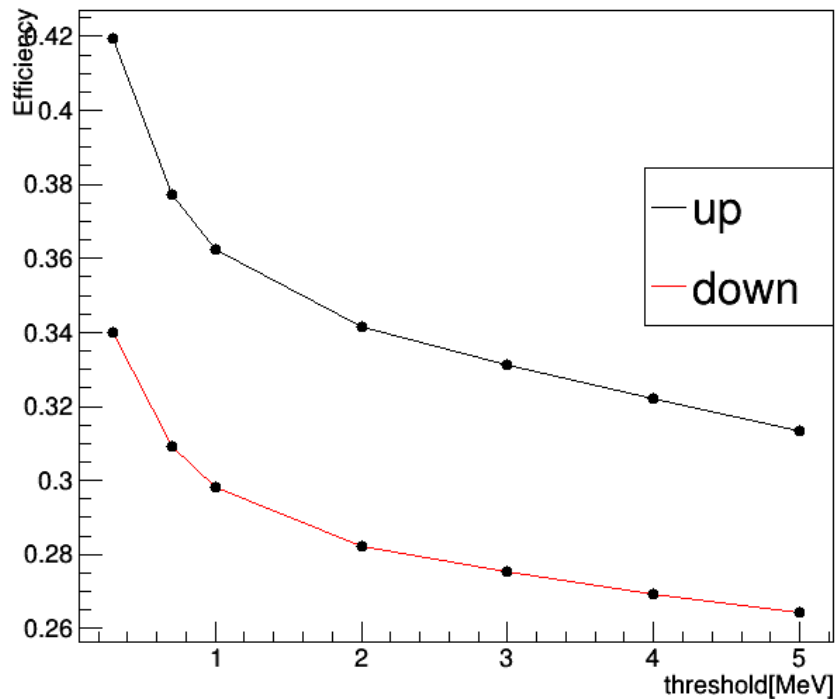
Why only count secondary pions?



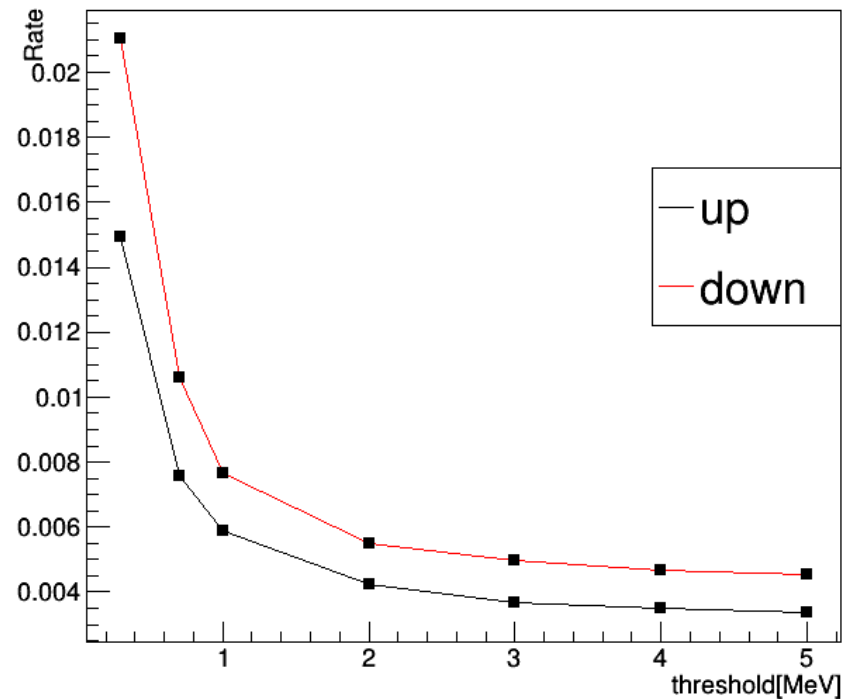
Cosmic ray rejection rate

- Threshold dependence

Selection Efficiency



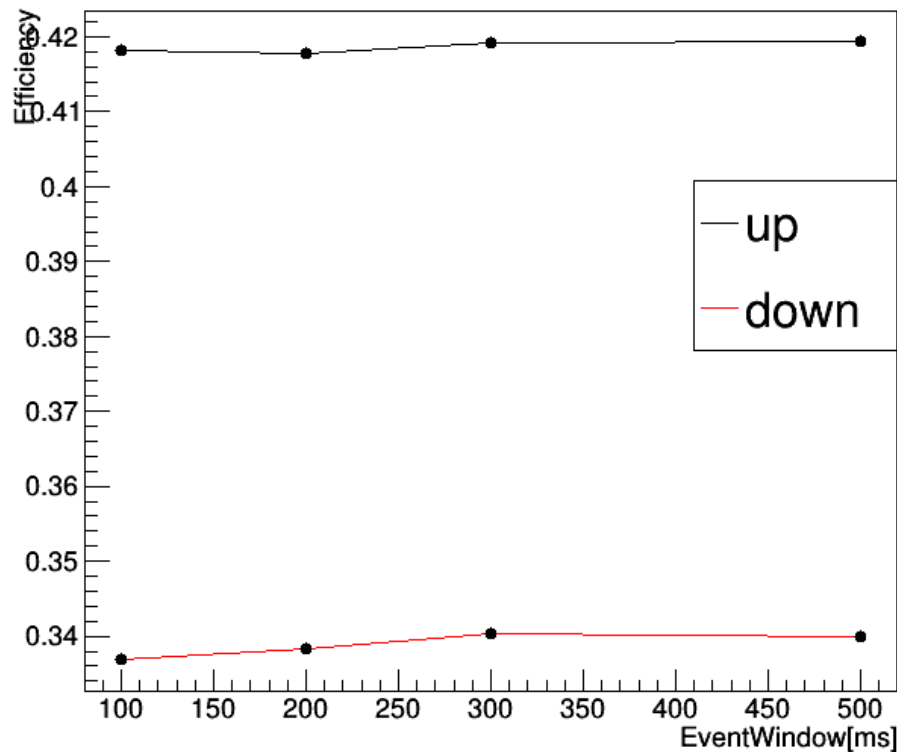
Background Rate



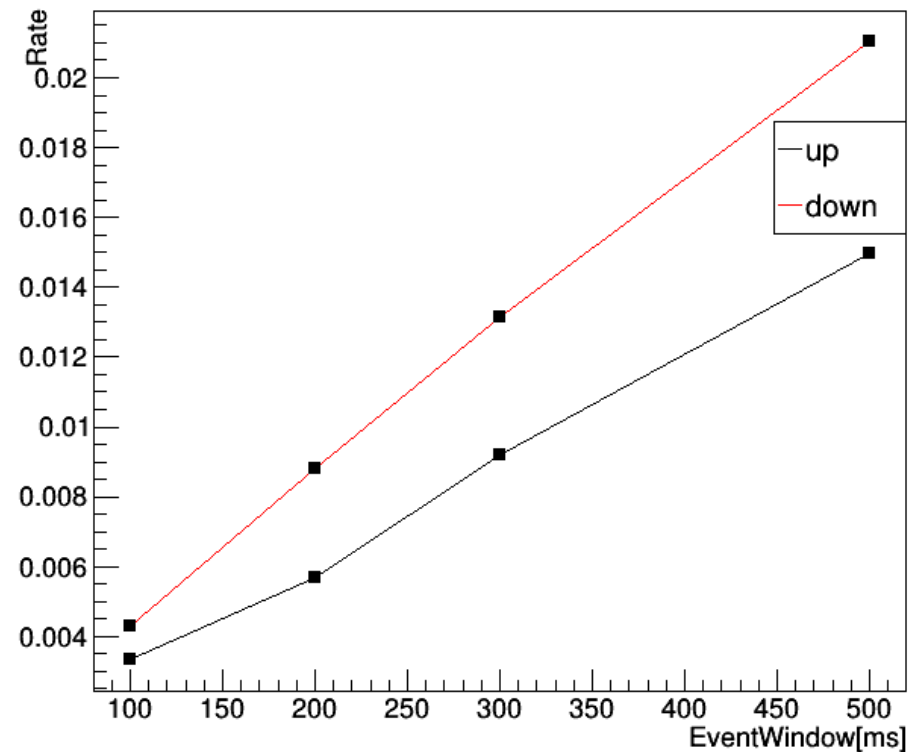
Cosmic ray rejection rate

- Event window dependence

SelectionEfficiency with threshold = 0.3 MeV

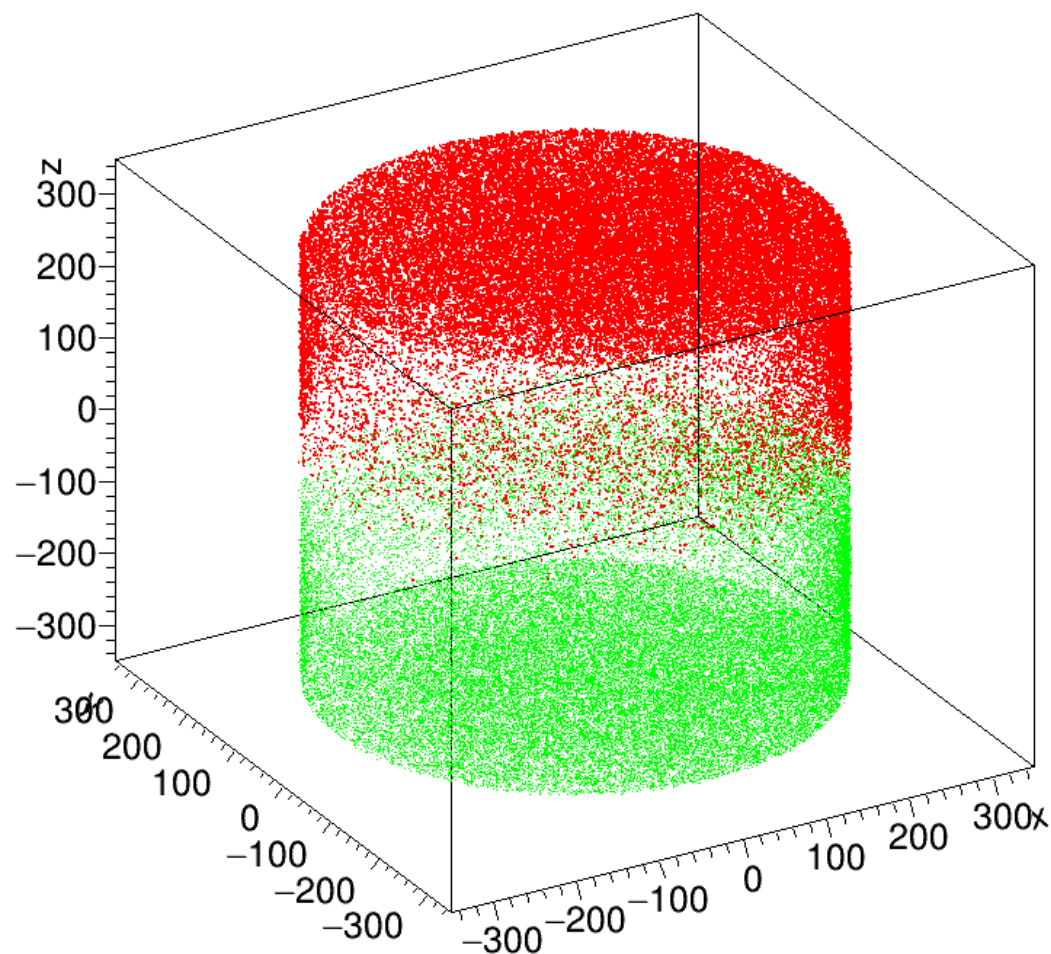


BackgroundRate with threshold = 0.3 MeV

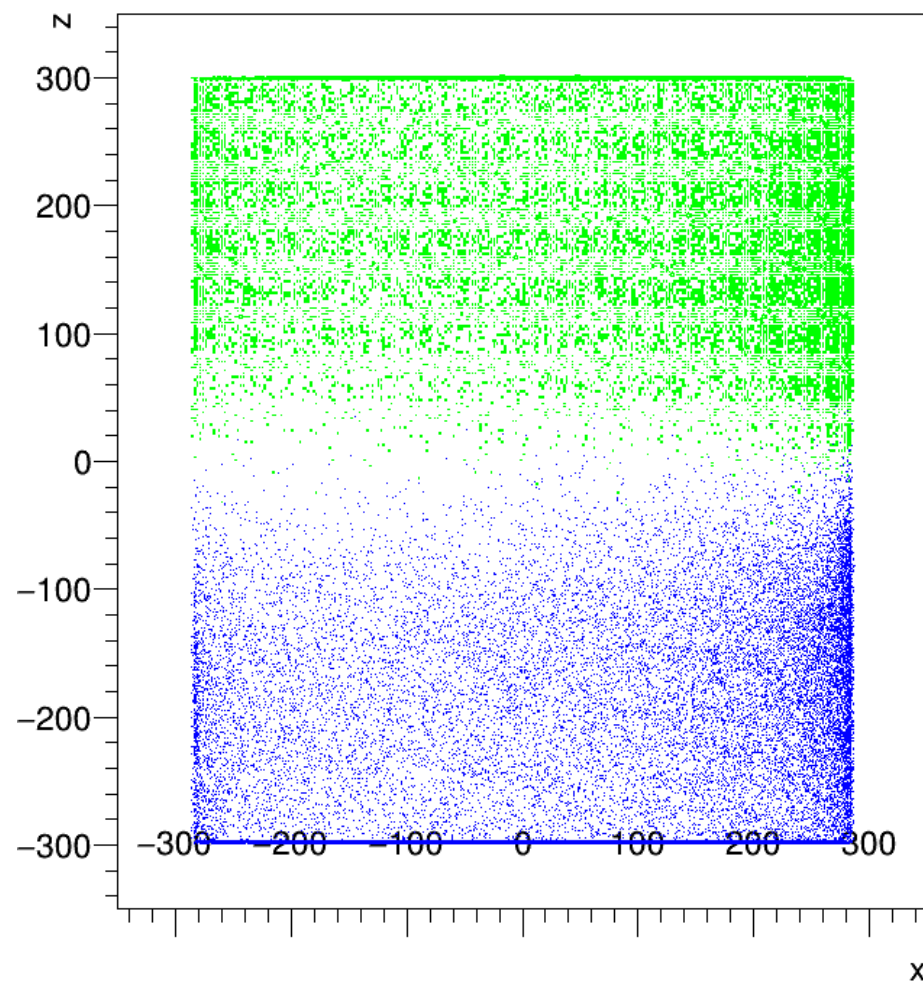


Pbar annihilation with thermal distribution

Annihilation Position

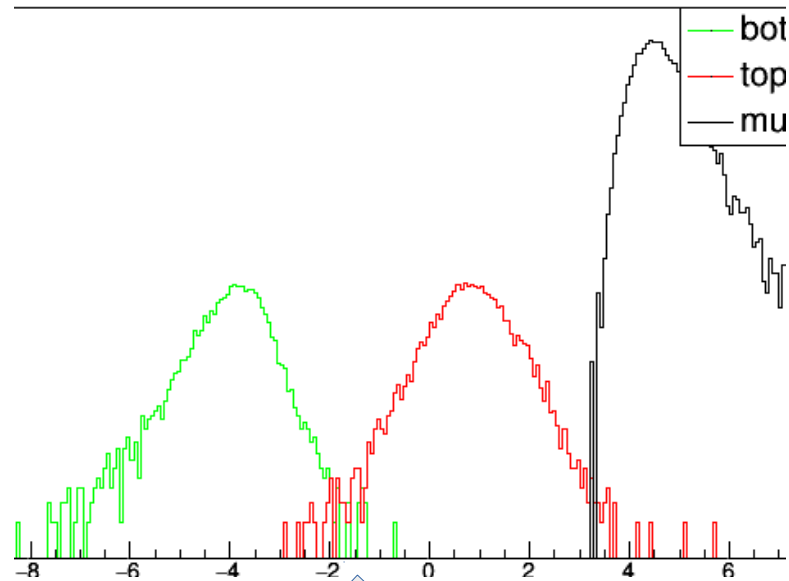


Annihilation Position



dt distribution change

From Center : 825



dt

