

The need for speed in Semileptonic MC generation

Marcin Chrzaszcz
mchrzasz@cern.ch



University of
Zurich ^{UZH}

$R(\Lambda_c^*)$ meeting, CERN
September 12, 2015

The problem

- The MC generation is quite inefficient \Rightarrow we generate a lot of events that are lost in the stripping and reconstruction.
- The dominate systematic in the $R(D^*)$ was the MC statistics.
- Every saved event will buy us something.
- Ideas:
 - Take really the inclusive states of τ and Λ_c .
 - Put generator cuts.

Generator cuts

⇒ We do not need events that have no chance passing our stripping selection.

⇒ We can put reject events based in the generator level on particles that enter in the stripping line: ex.

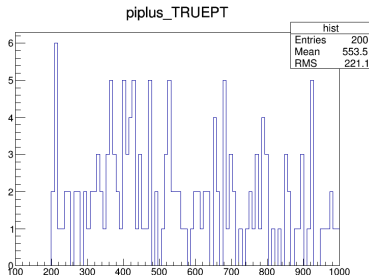
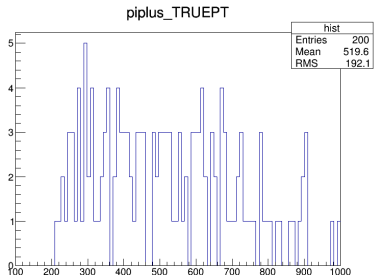
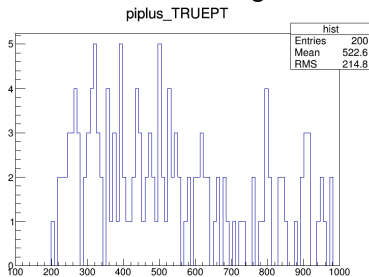
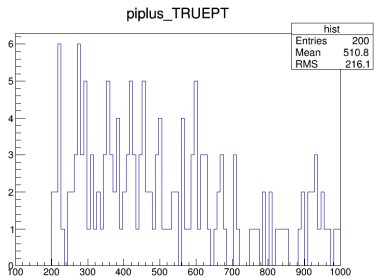
[Lambda_b0 -> (Lambda_c(2595)+ -> (Lambda_c+ -> \hat{p} + K- \hat{p} i+) pi+ pi-) (tau- -> $\hat{\mu}$ - nu_tau nu_mu) nu_tau]CC

⇒ Only particles with $\hat{}$ have the following requirements and are required to be in LHCb acceptance.

Particle	Generator		Stripping	
Hadrons(p, π, K)	p_T	> 200MeV	p_T	> 300MeV
Hadrons(p, π, K)	p	> 1800MeV	p	> 2000MeV
Muons	p_T	> 600MeV	p_T	> 800MeV
Muons	p	> 2800MeV	p	> 3000MeV

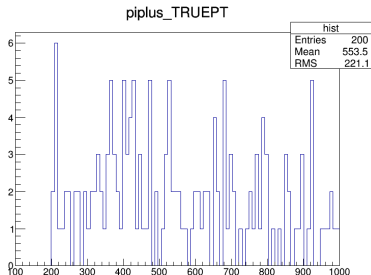
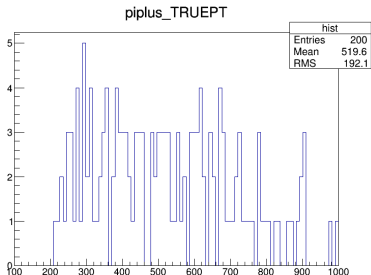
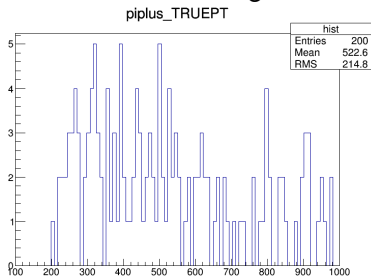
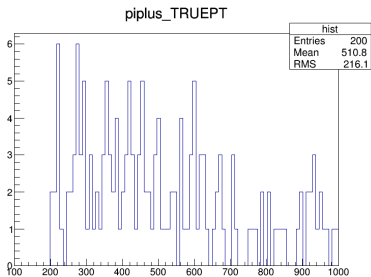
Sanity check

⇒ Generated 200 events in the MC level and see if the things are ok.



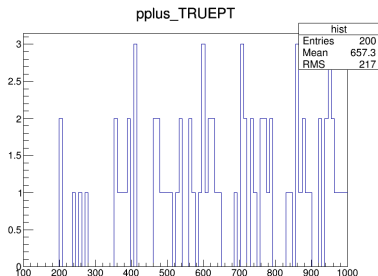
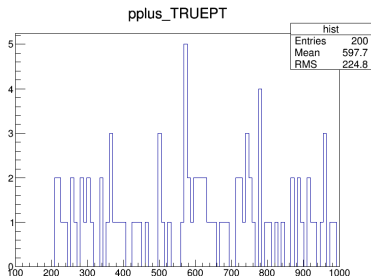
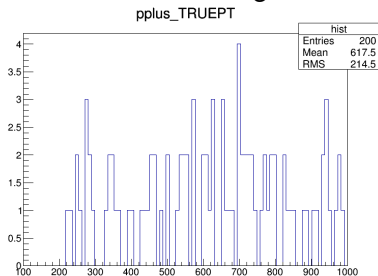
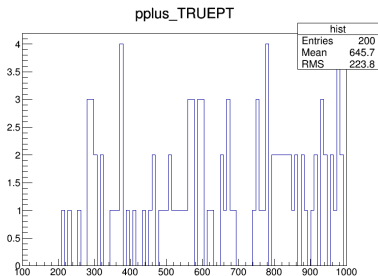
Sanity check

⇒ Generated 200 events in the MC level and see if the things are ok.



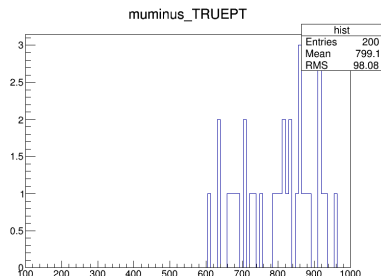
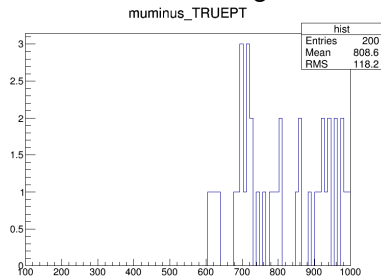
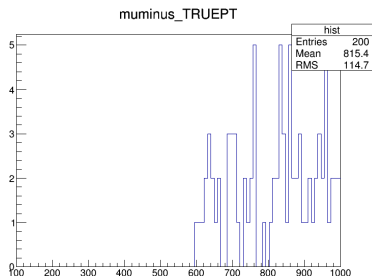
Sanity check

⇒ Generated 200 events in the MC level and see if the things are ok.



Sanity check

⇒ Generated 200 events in the MC level and see if the things are ok.



Comment: When I simulate the 3π τ decay there is no μ .

Conclusions

- I think we squeezed everything there is from the simulation ;)

