FastPV in $\mu + 2\,b$ jets trigger at high pile-up

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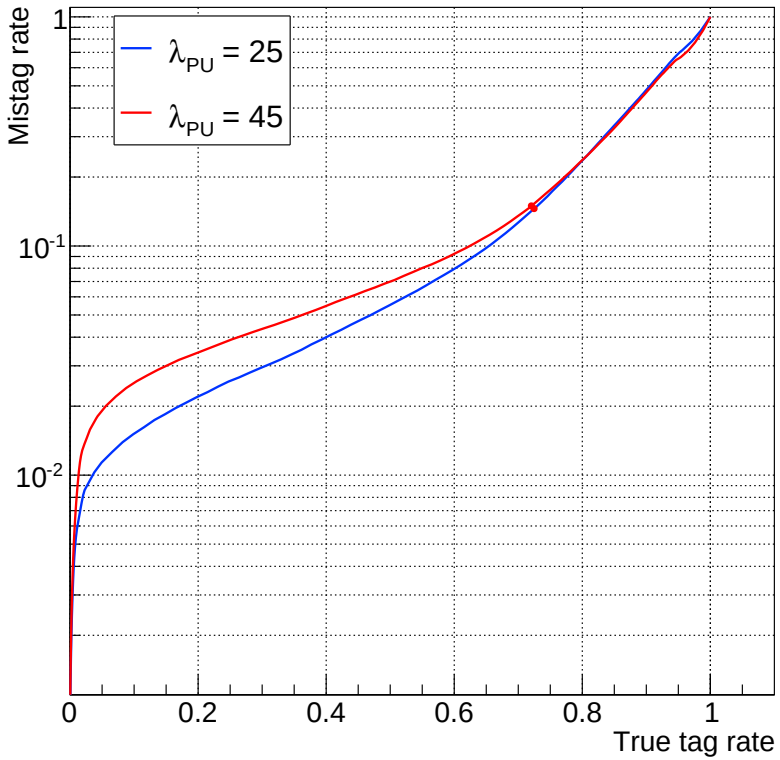
Outline

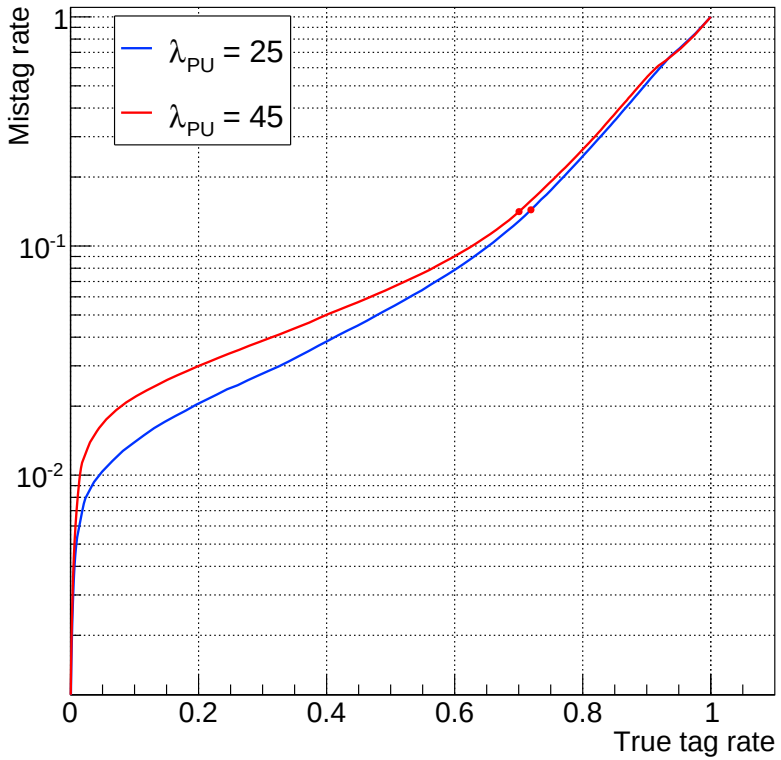
- Studied `HLT_Mu12_eta2p1_DiCentral_40_20_DiBTagIP3D1stTrack_v8` from `8e33v2` menu and a modified version of it that uses FastPV at both L2 and L3 (details in this talk)
- Two 25 ns pile-up scenarii compared using datasets
  - `/TTbar_TuneZ2star_13TeV-pythia6-tauola/Summer13dr53X-PU25bx25_START53_V19D-v1/GEN-SIM-RAW`
  - `/TTbar_TuneZ2star_13TeV-pythia6-tauola/Summer13dr53X-PU45bx25_START53_V19D-v1/GEN-SIM-RAW`

b vs *uds* at L2

Original @ L2, b vs uds

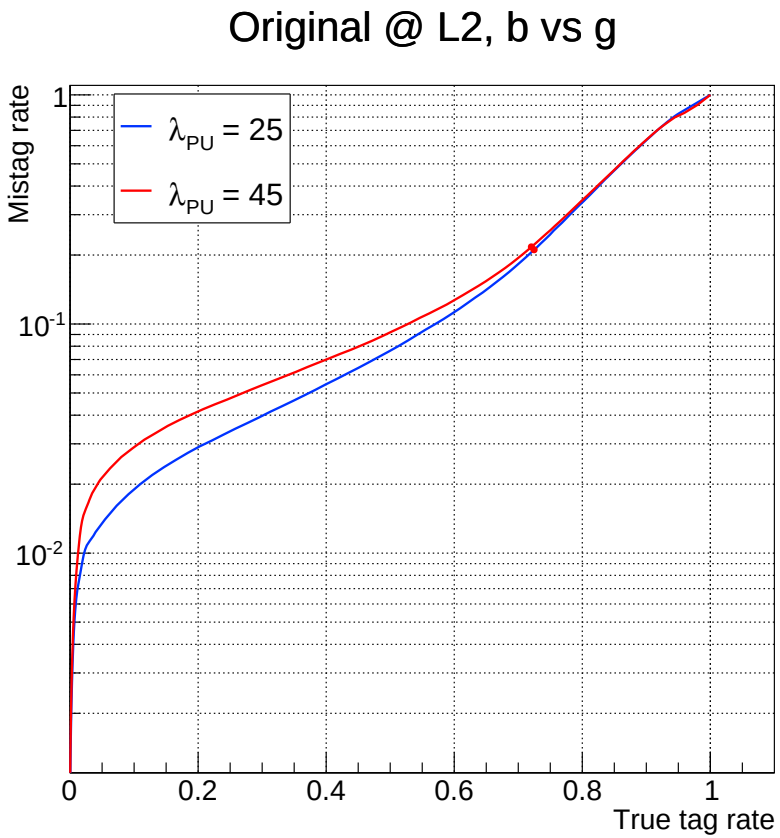


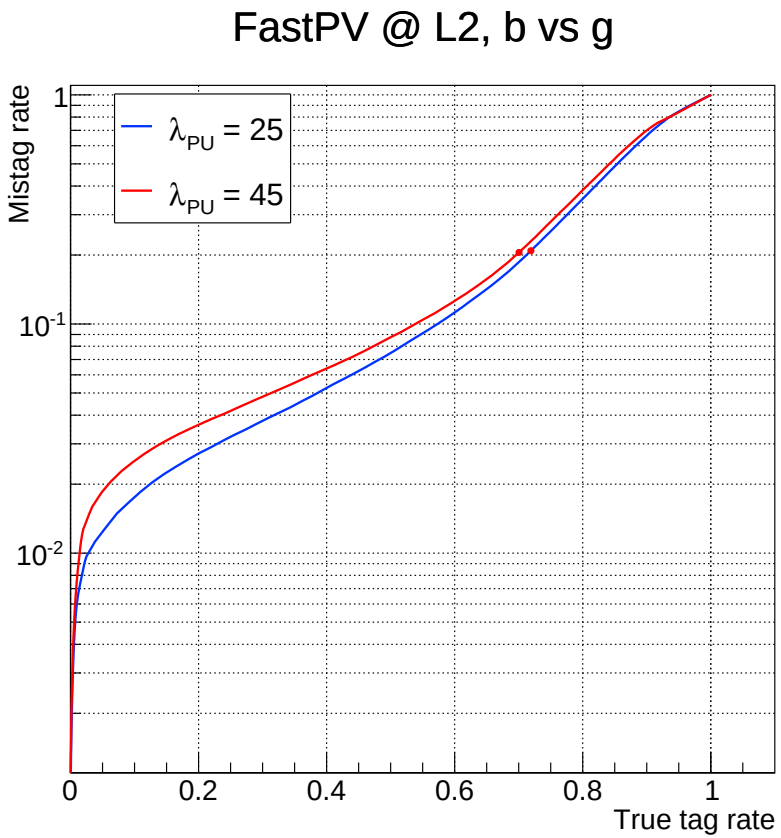
FastPV @ L2, b vs uds



Marked working point corresponds to discriminator value of 2.5

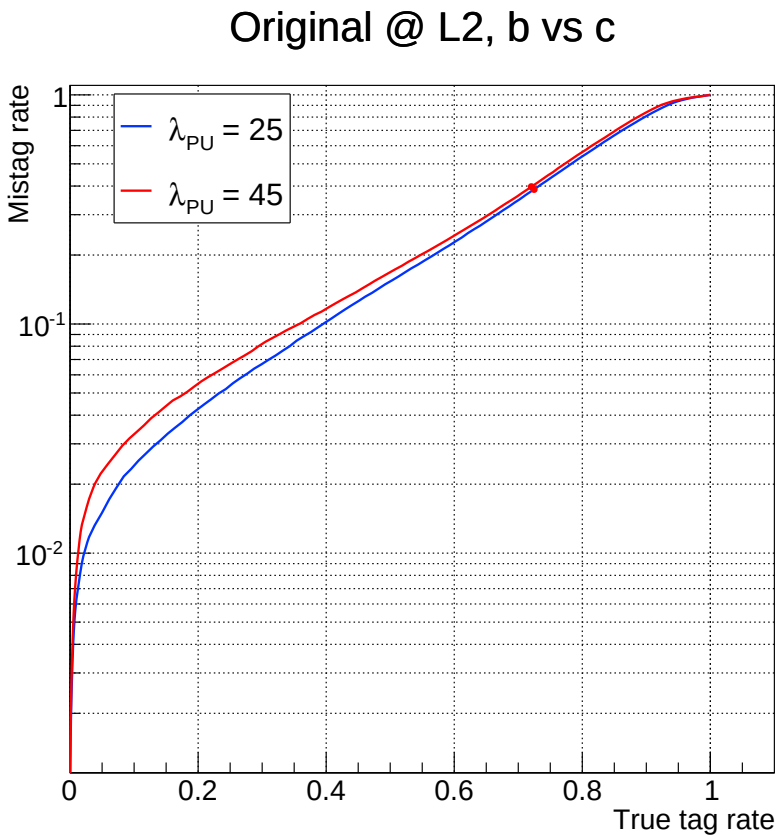
b vs g at L2

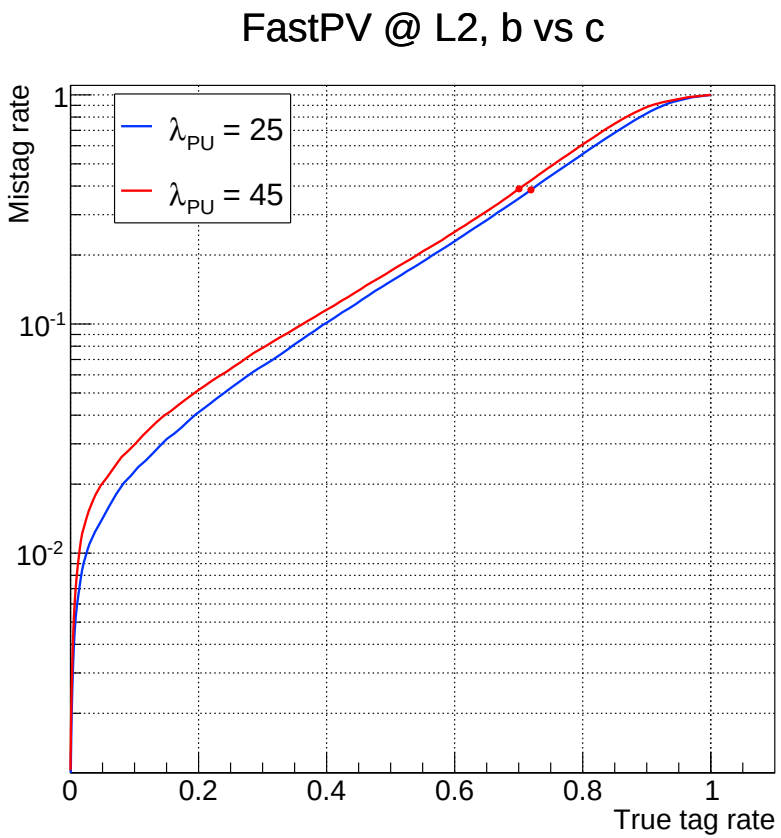




Marked working point corresponds to discriminator value of 2.5

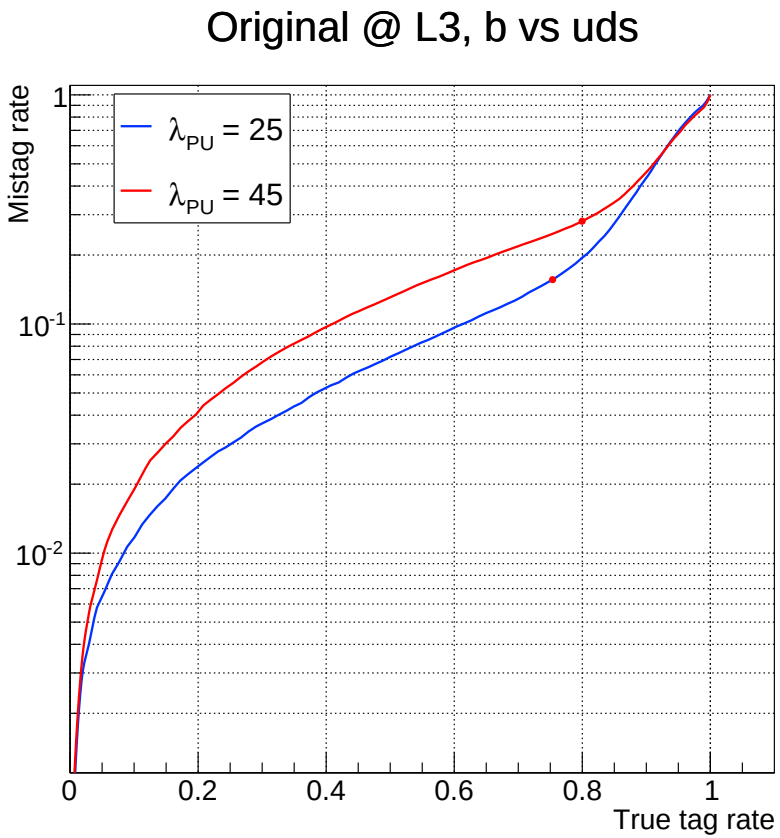
b vs *c* at L2

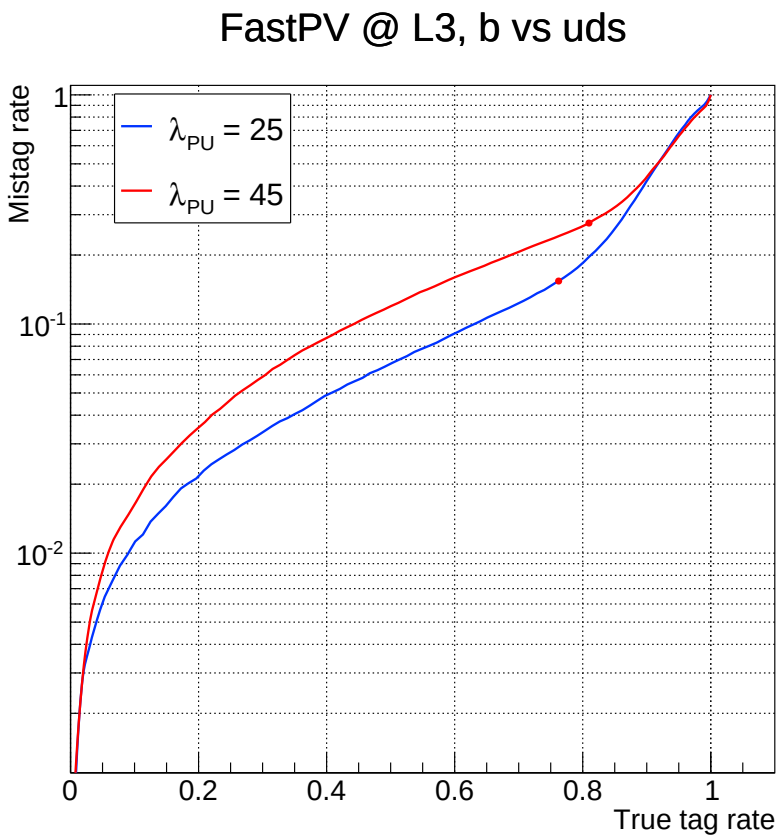




Marked working point corresponds to discriminator value of 2.5

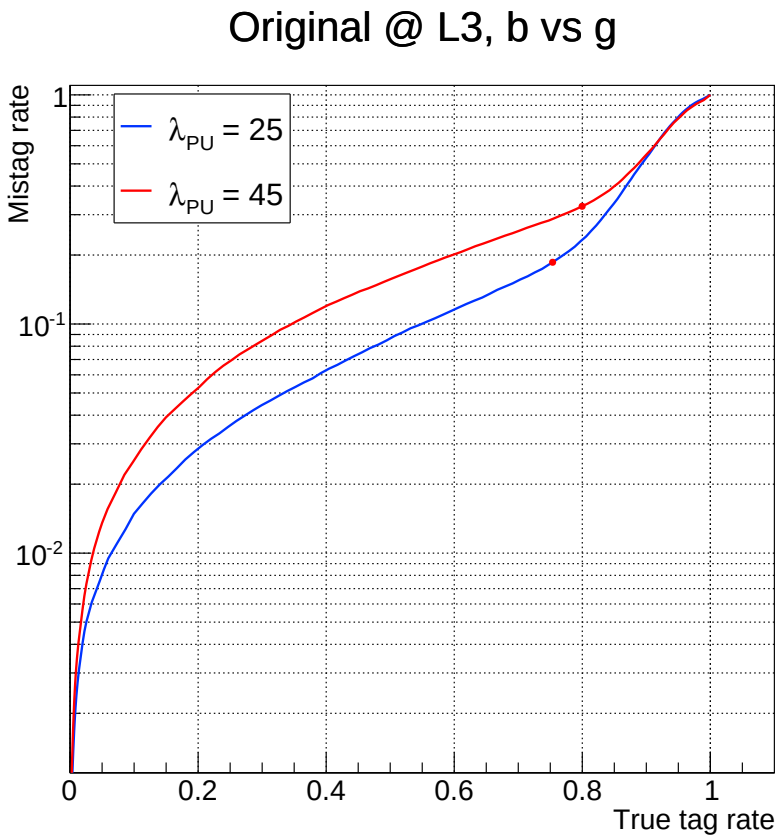
b vs *uds* at L3

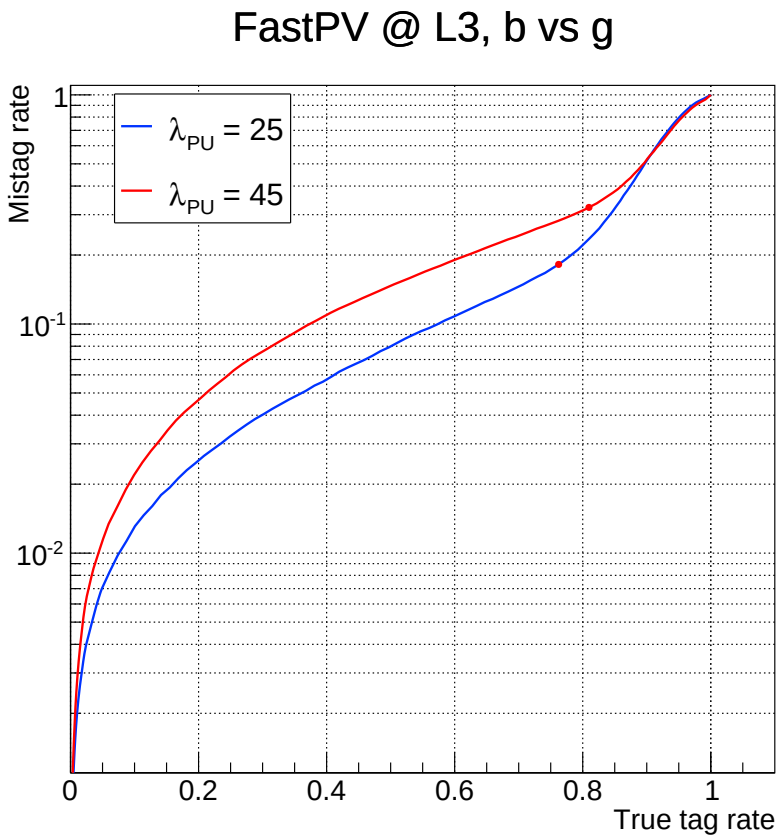




Marked working point corresponds to discriminator value of 3.5

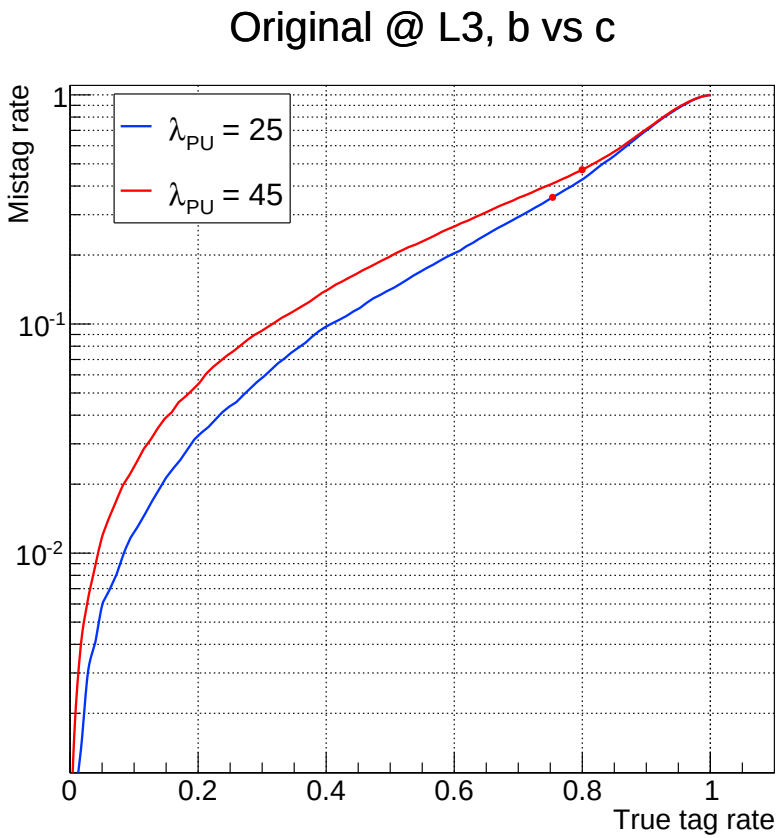
b vs g at L3

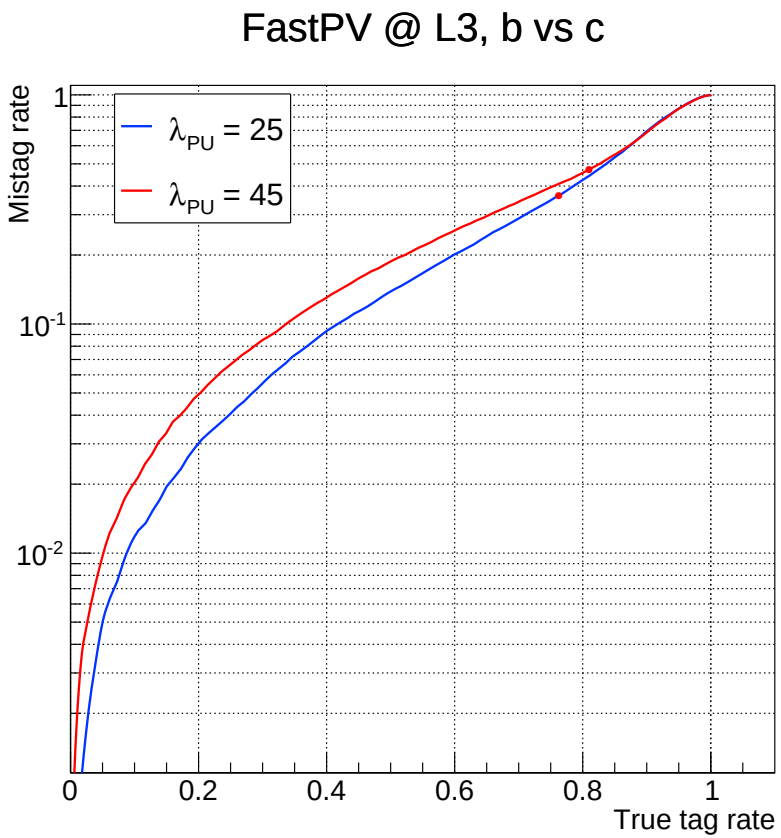




Marked working point corresponds to discriminator value of 3.5

b vs *c* at L3





Marked working point corresponds to discriminator value of 3.5

Summary

- Both the original trigger path (with "z gap" clustering) and the FastPV version demonstrate very similar performance and similar degradation at larger pile-up.