



Institute of High Energy Physics
Chinese Academy of Sciences



Weekly Report on Dataset for BESIII ML

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DATASET FOR TRACK RECONSTRUCTION

✓ Start from simplest MC data

(1) single particle: $e^\pm, \mu^\pm, \pi^\pm, K^\pm, p^\pm$

p : 0.1~1.5(GeV) $\cos\theta$: -1.0 ~ 1.0 Φ : $-\pi \sim \pi$

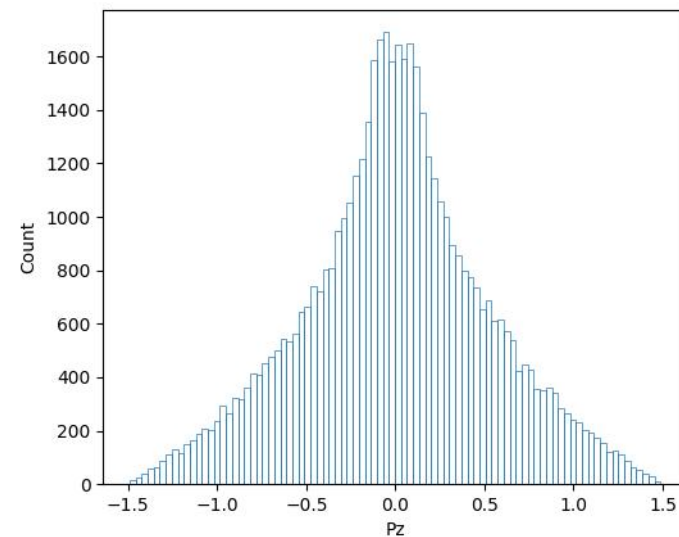
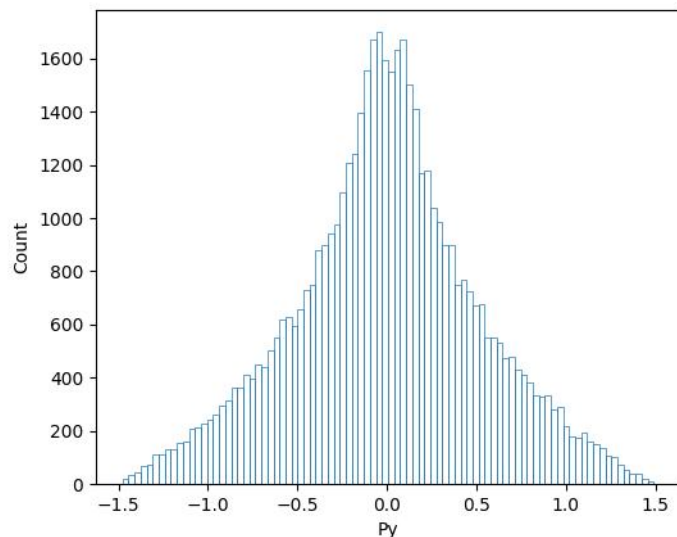
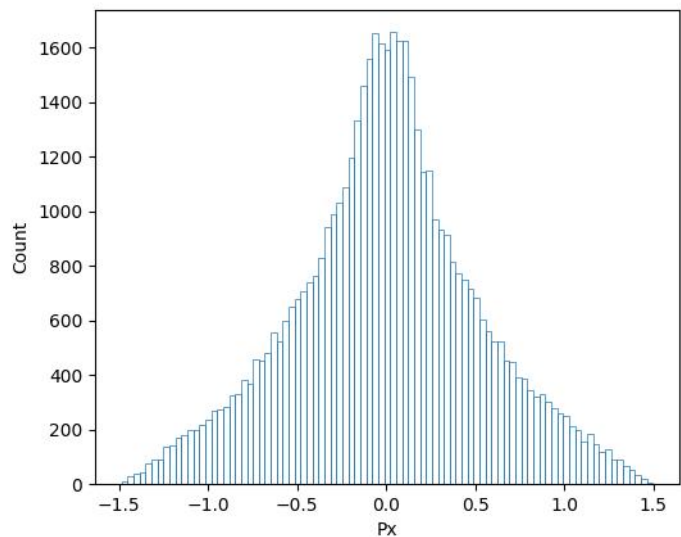
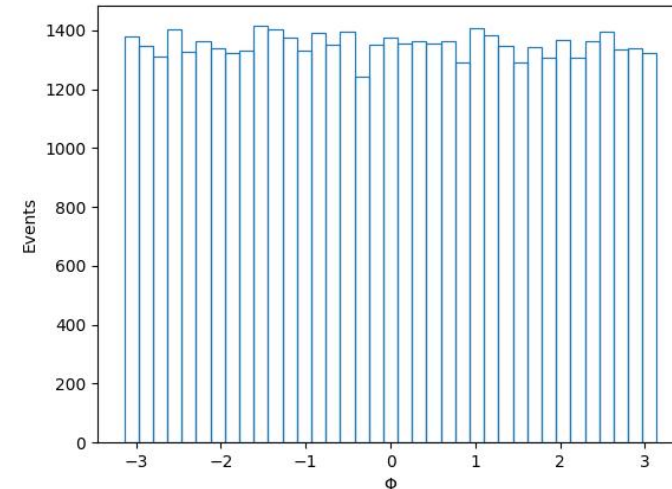
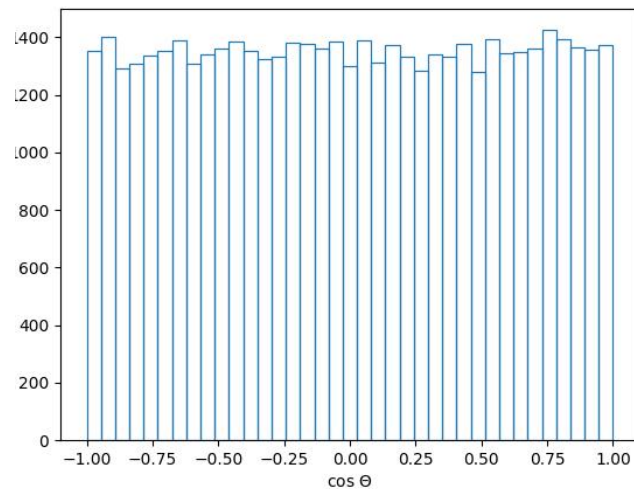
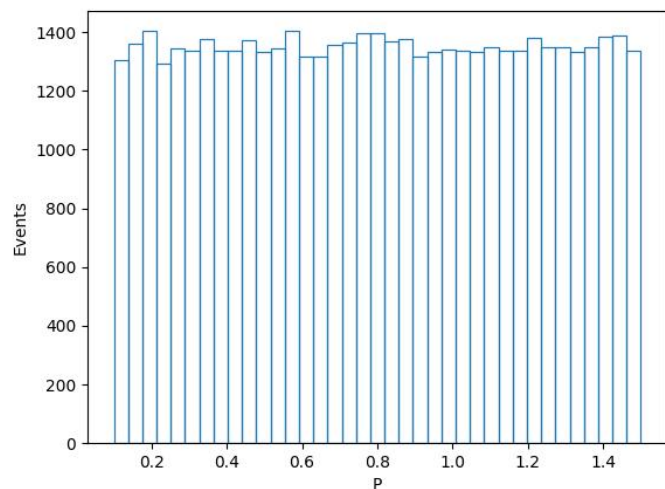
requirements: Uniform Distribution

(2) two particles: 2 single particles, bhabha events

(3) multiple particles: $J/\psi, \psi(2S)$

DATASET FOR TRACK RECONSTRUCTION

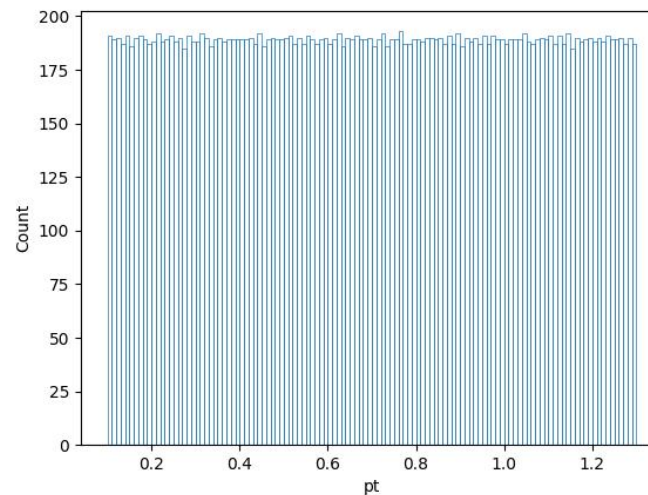
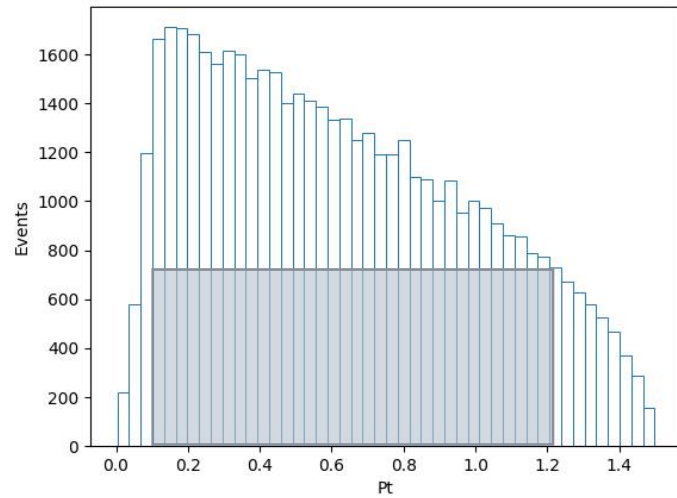
e^+ : 50k events for a look p : 0.1~1.5(GeV) $\cos\theta$: -1.0 ~ 1.0 Φ : $-\pi \sim \pi$



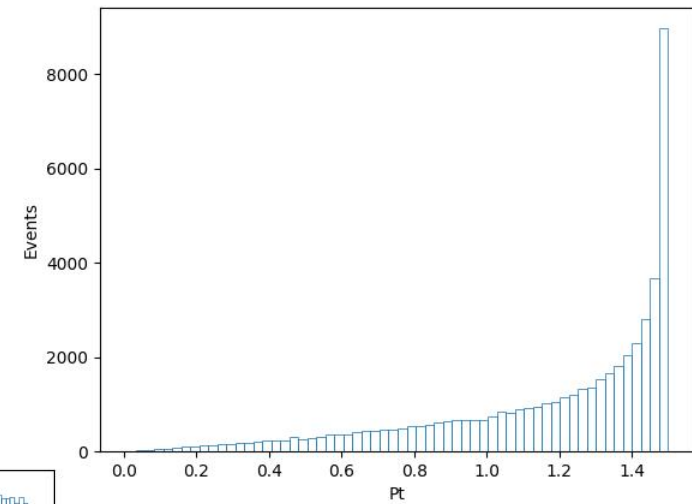
DATASET FOR TRACK RECONSTRUCTION

e^+ : 50k events for a look

p : 0.1~1.5(GeV)

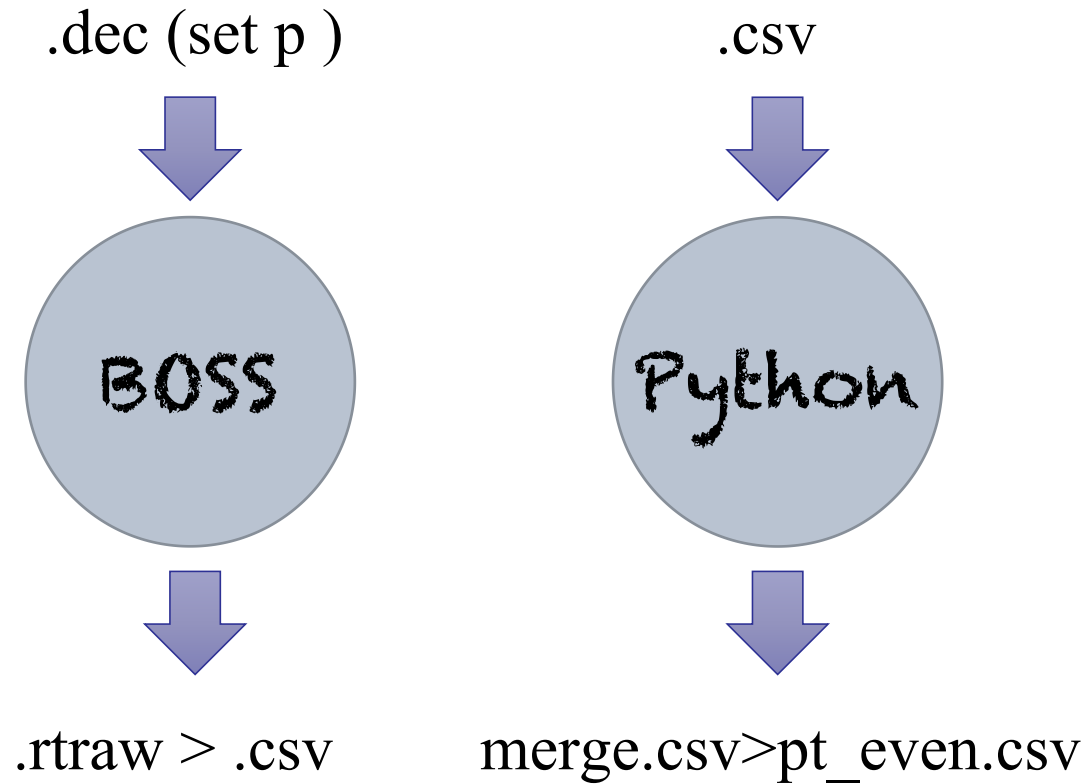


$p=1.5(\text{GeV})$

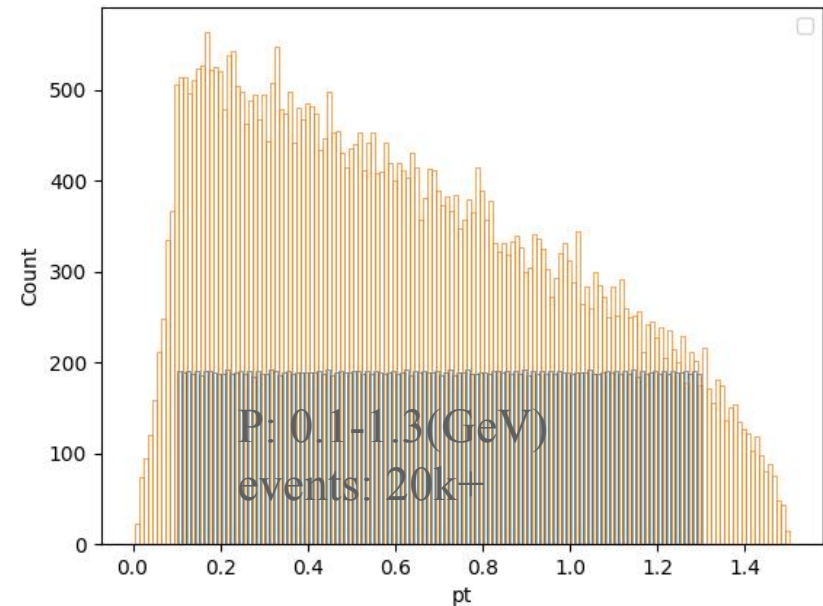


DATASET FOR TRACK RECONSTRUCTION

✓ Dataset generation process:



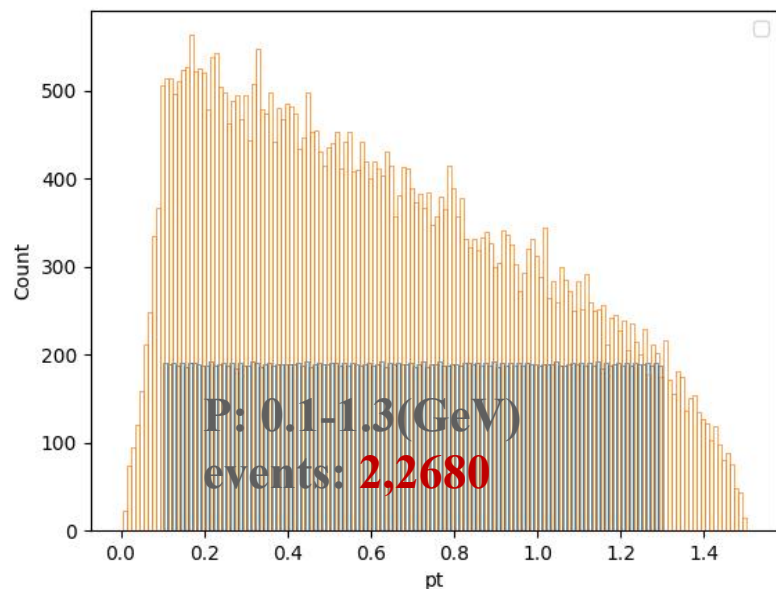
?leading to: reduced pt range;
decreased event numbers



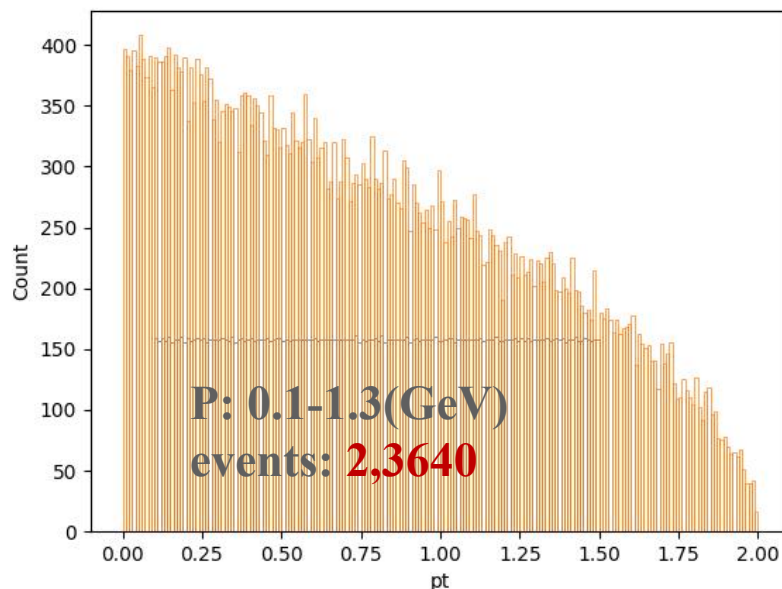
P: 0.1-1.5(GeV)
events: 50k

DATASET FOR TRACK RECONSTRUCTION

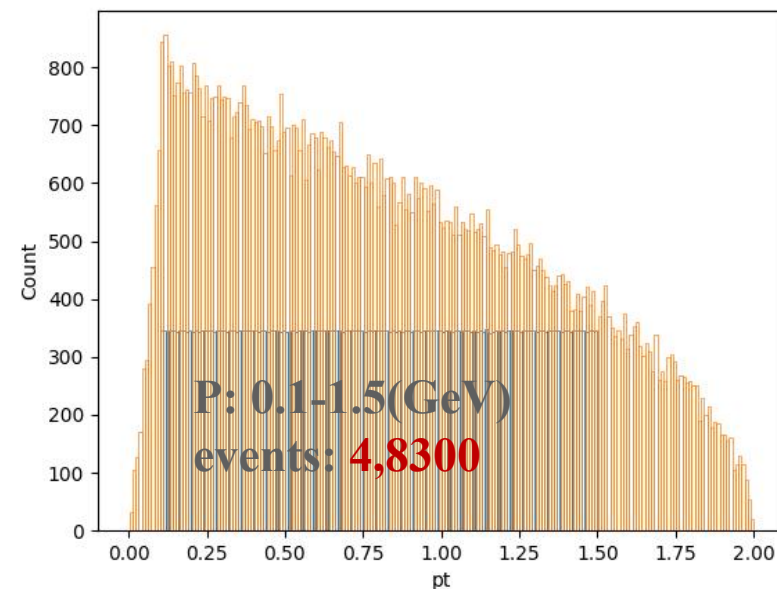
✓ To increase the number of events



P: 0.1-1.5(GeV)
events: 50k



P: 0.0-2.0(GeV)
events: 50k (actually <50k)



P: 0.1-2.0(GeV)
events: 100k

DATASET FOR TRACK RECONSTRUCTION

Later plans:

- (1) Create complete single particle dataset.
- (2) To see bhabha event, its space and momentum distribution.

code&csv files

<https://code.ihep.ac.cn/ai4hep/bes-tracking-datasets/-/tree/dev/display>