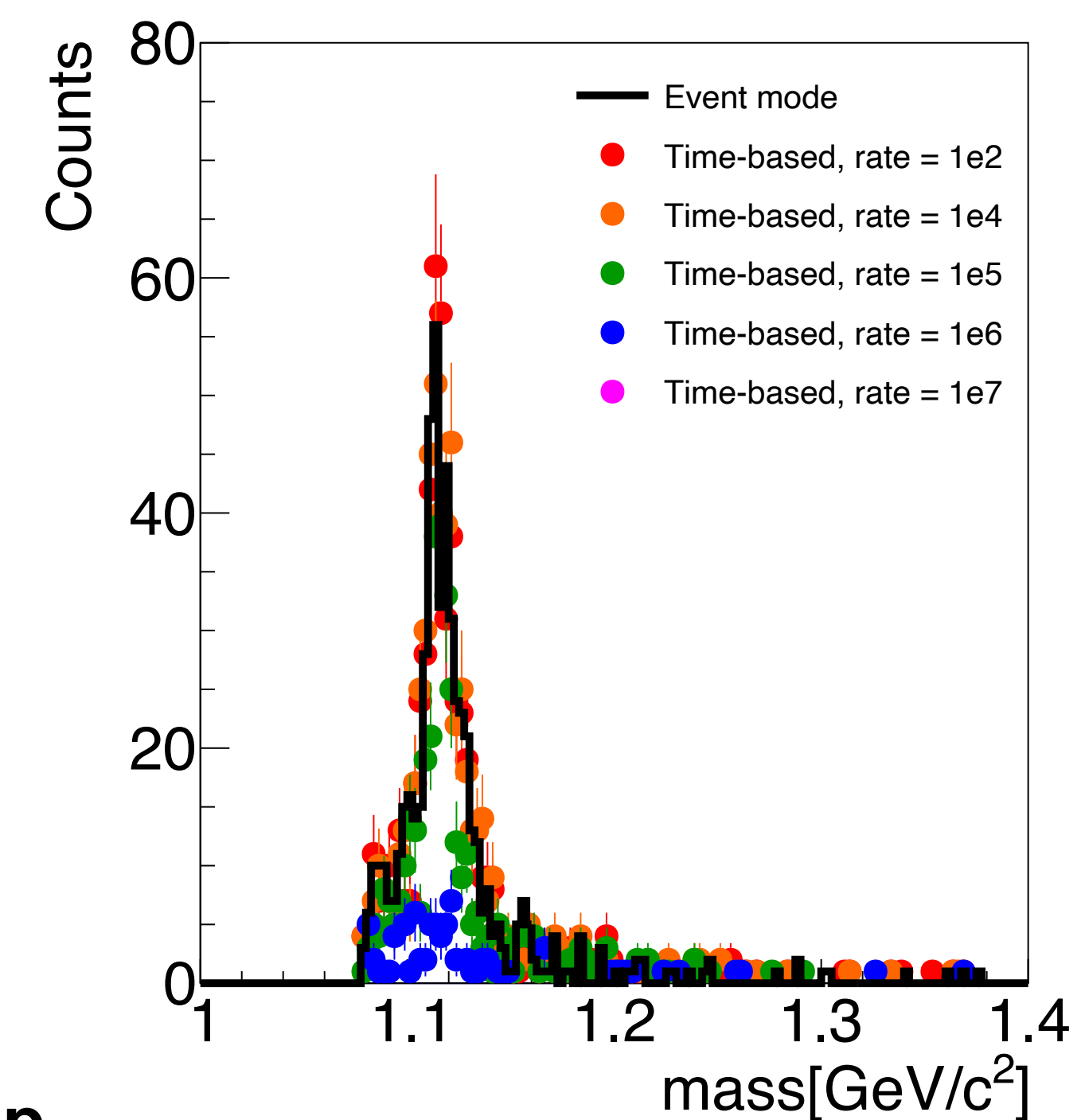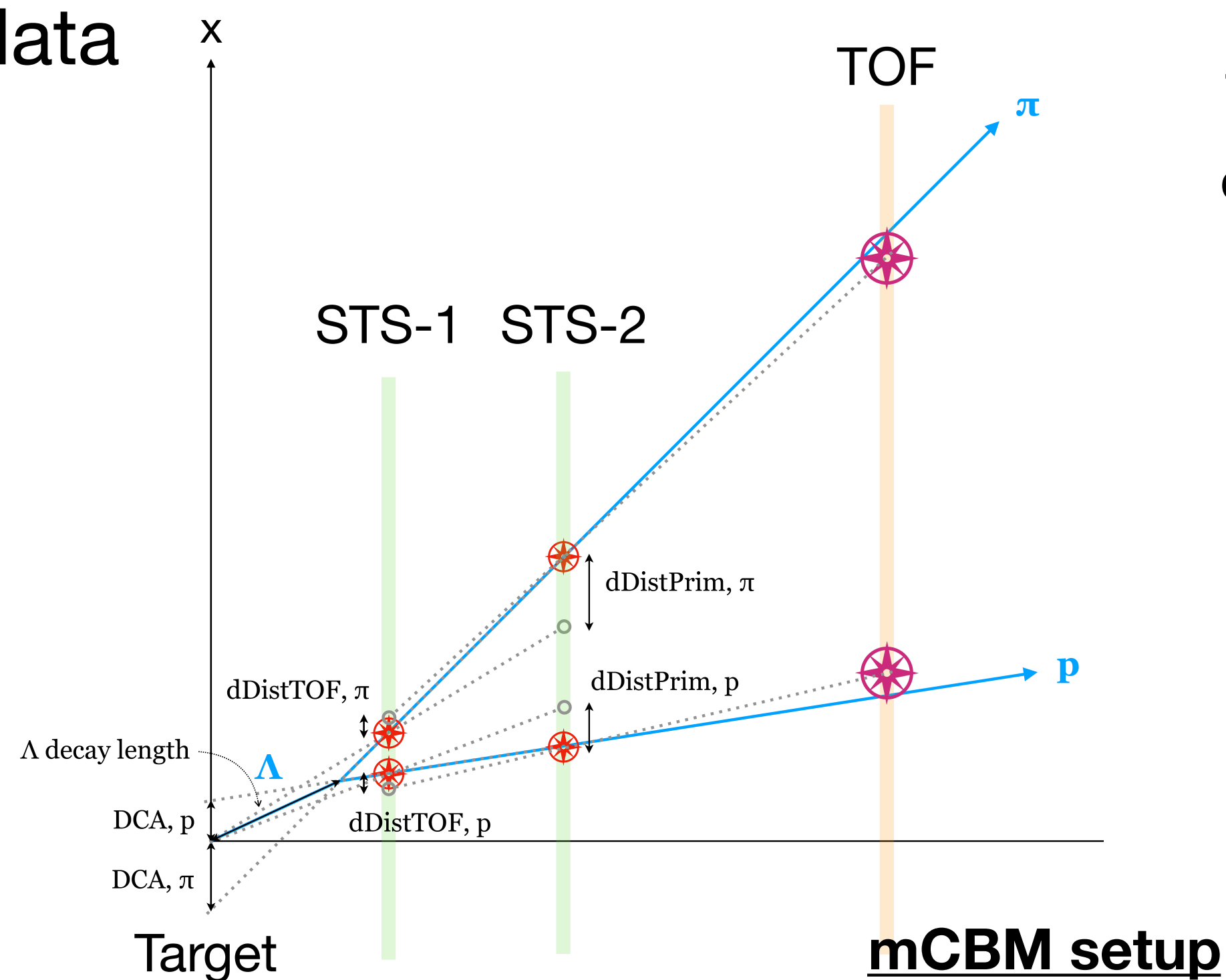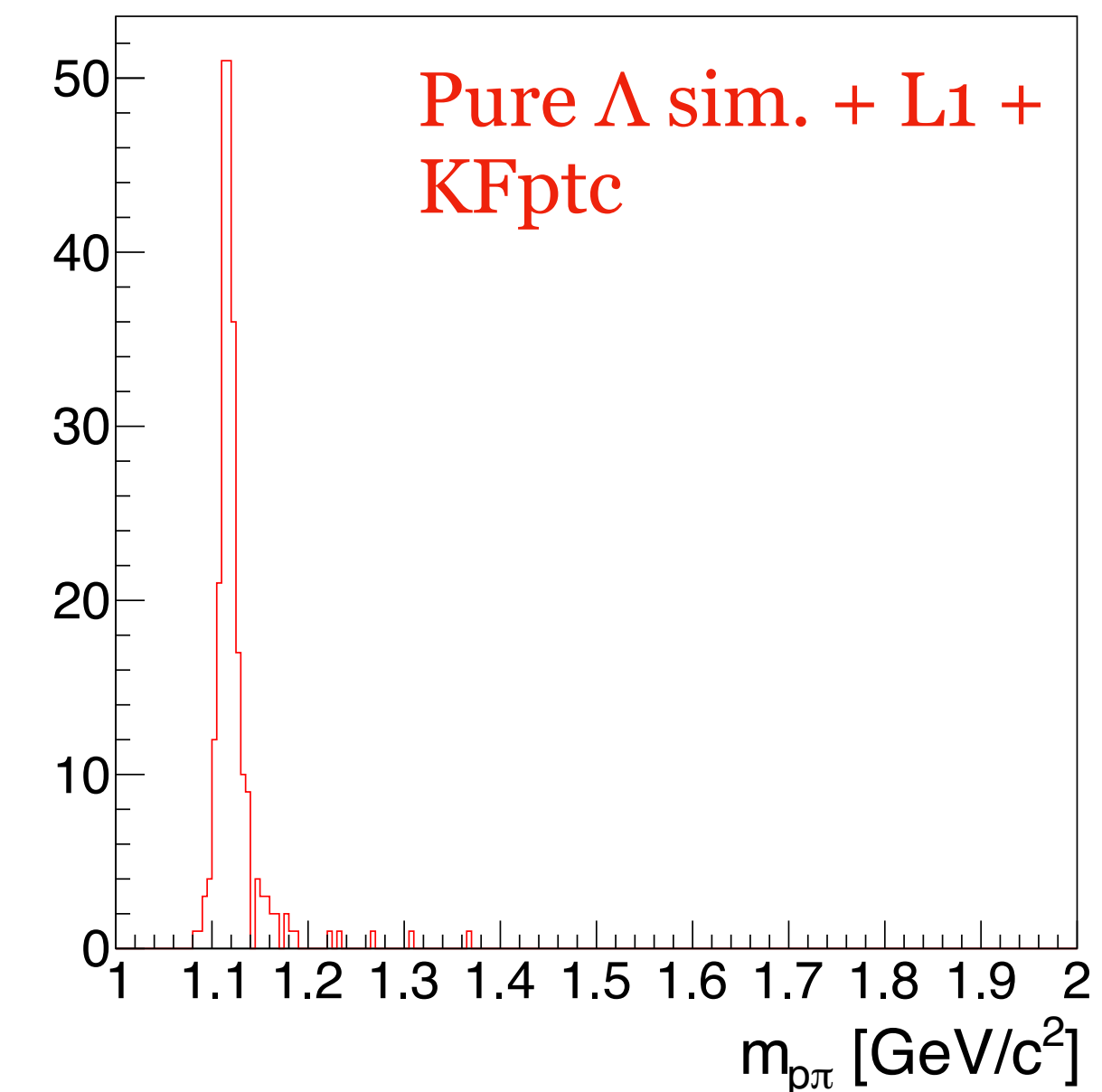# KFParticle application to mCBM

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KFParticle application to mCBM

- **Goal: apply KFparticle to mCBM data (and simulations) for Λ reconstruction**

  ✓ Apply KFparticle to evt-based single Λ sim.

  ✓ Apply KFparticle to time-based URQMD sim.

  ✗ Apply KFparticle to mCBM data

Pure Λ sim. + L1 + KFptc

$m_{p\pi}$ [GeV/c^2]

mCBM setup

Counts

mass[GeV/c^2]

Event mode
Time-based, rate = 1e2
Time-based, rate = 1e4
Time-based, rate = 1e5
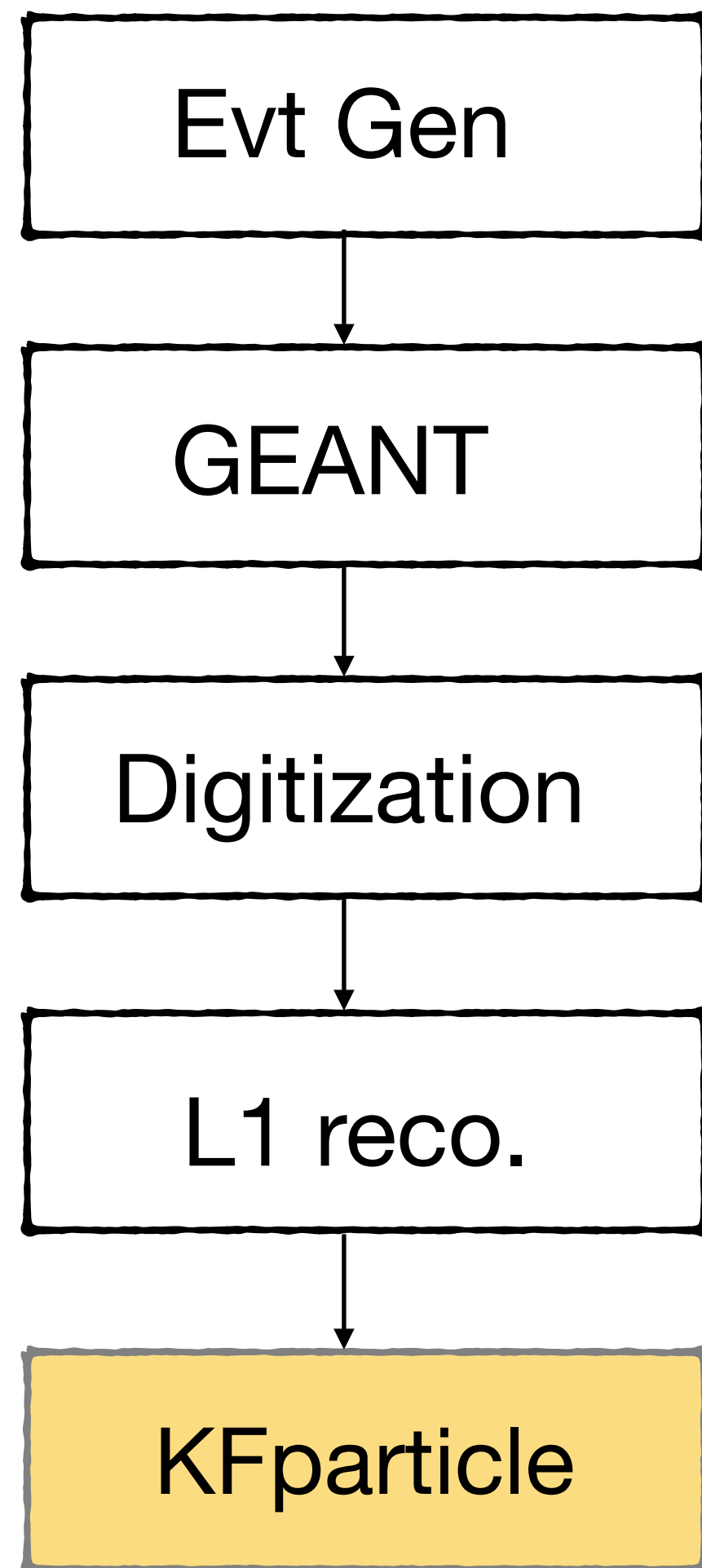Time-based, rate = 1e6
Time-based, rate = 1e7

Work in progress and wishlist

- Work in progress:

  - Implement the event-mixing code (developed for KFParticle @ STAR) for mCBM (ongoing)

  - Remove dependence on simulation info.

- Backup slides follow
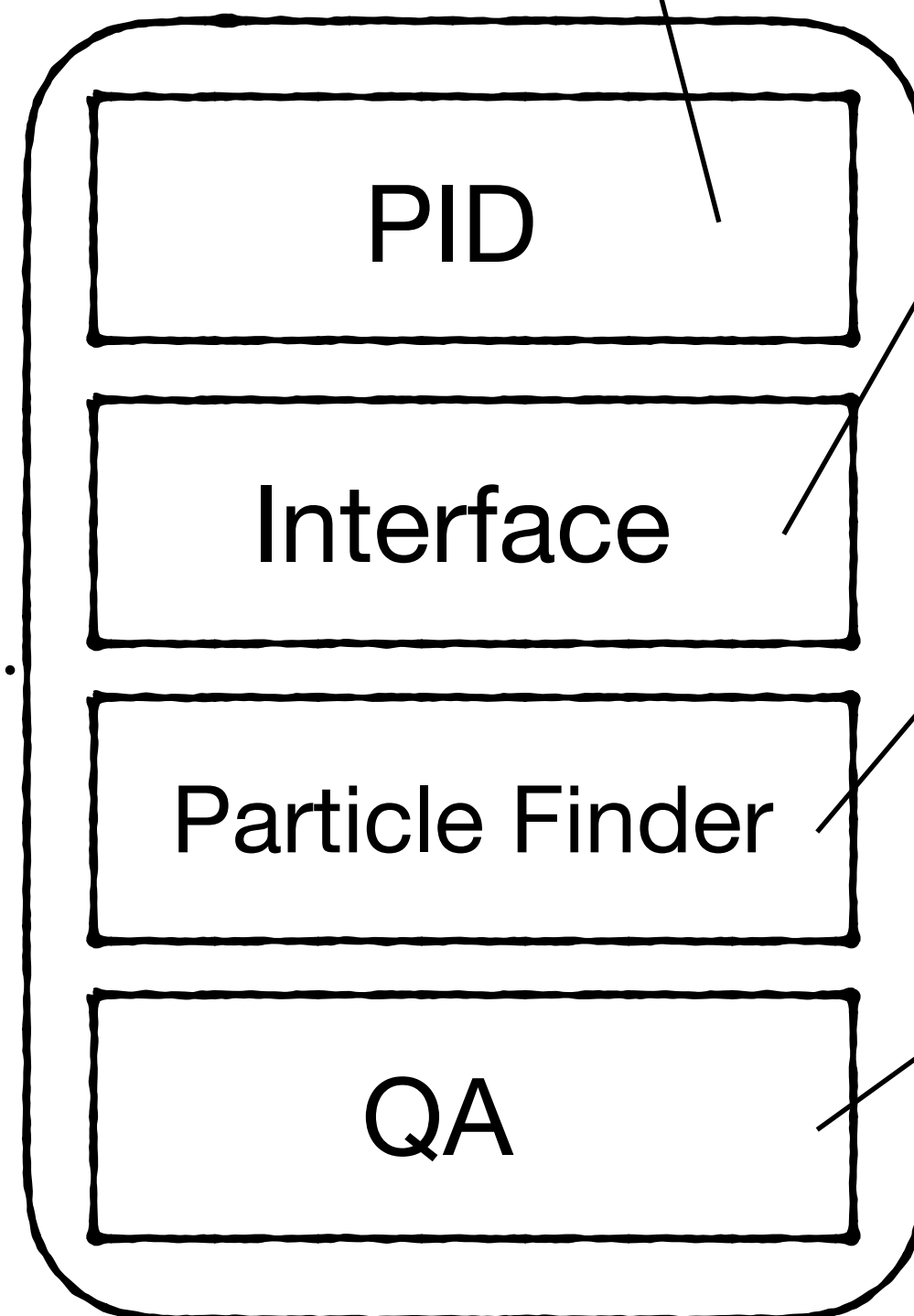
CBM simulation framework

Evt Gen

GEANT

Digitization

L1 reco.

KFparticle

- Truth MC PID
- Detector PID
- Topological PID

PID

Interface

Particle Finder

QA

Reads info. from **STS tracks** save them as **KFparticles** (π, K, p, fragments)

The core algorithm: constructs short-lived particles from their daughter particles

Fills histograms: quality (χ^2) and kinematic variables (m, p_T, opening angle, etc.)

mCBM simulation framework

Evt Gen

GEANT

Digitization

L1 reco.

KFparticle

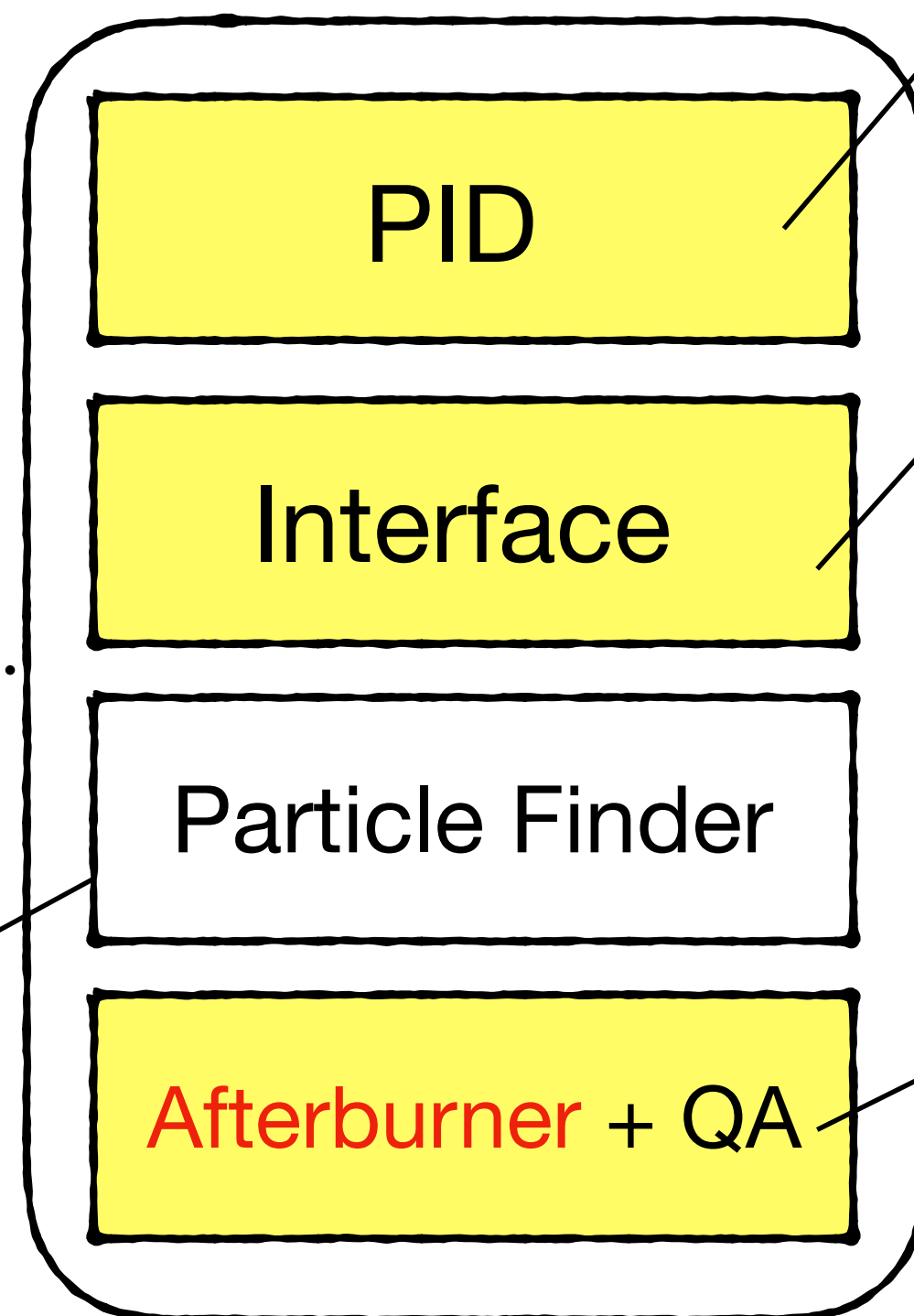Core algorithm **unmodified**

PID

Interface

Particle Finder

Afterburner + QA

- Relax min. no. of hits to be 3
- Require 2 STS hits (for topo. selection) 1+ TOF hit (for velocity measurement)

Topological PID (p or π based on DCA)

- Modify usage of STS Tracks to Global Tracks
- Calculate momentum based on TOF time and PID hypo.

- Momentum was calculated assuming particle travelled from PV to TOF -> not true for secondary particles
  - Afterburner to iteratively calculate true momentum