Pattern Finding Update

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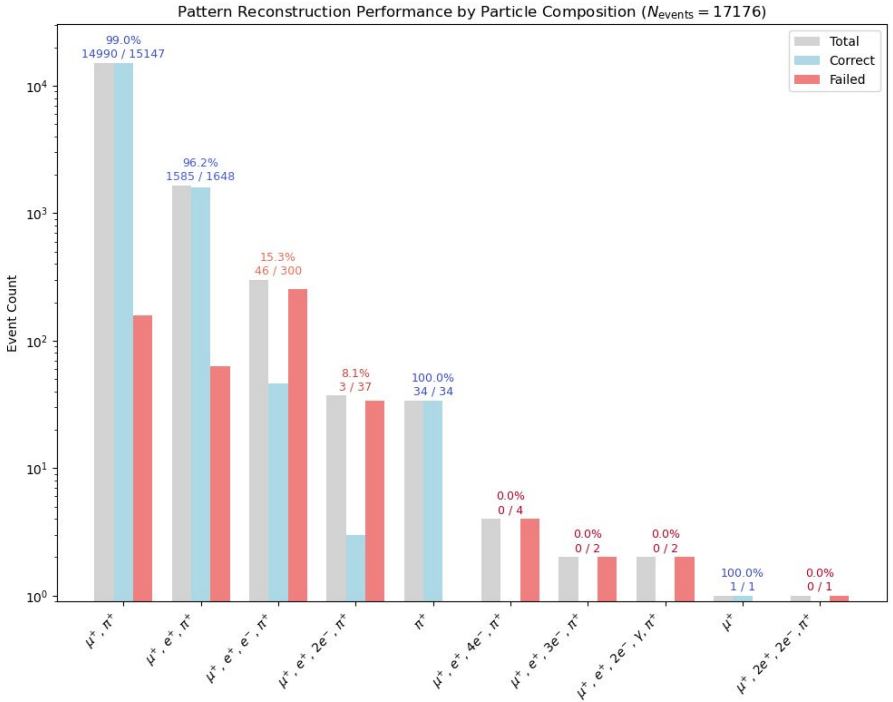
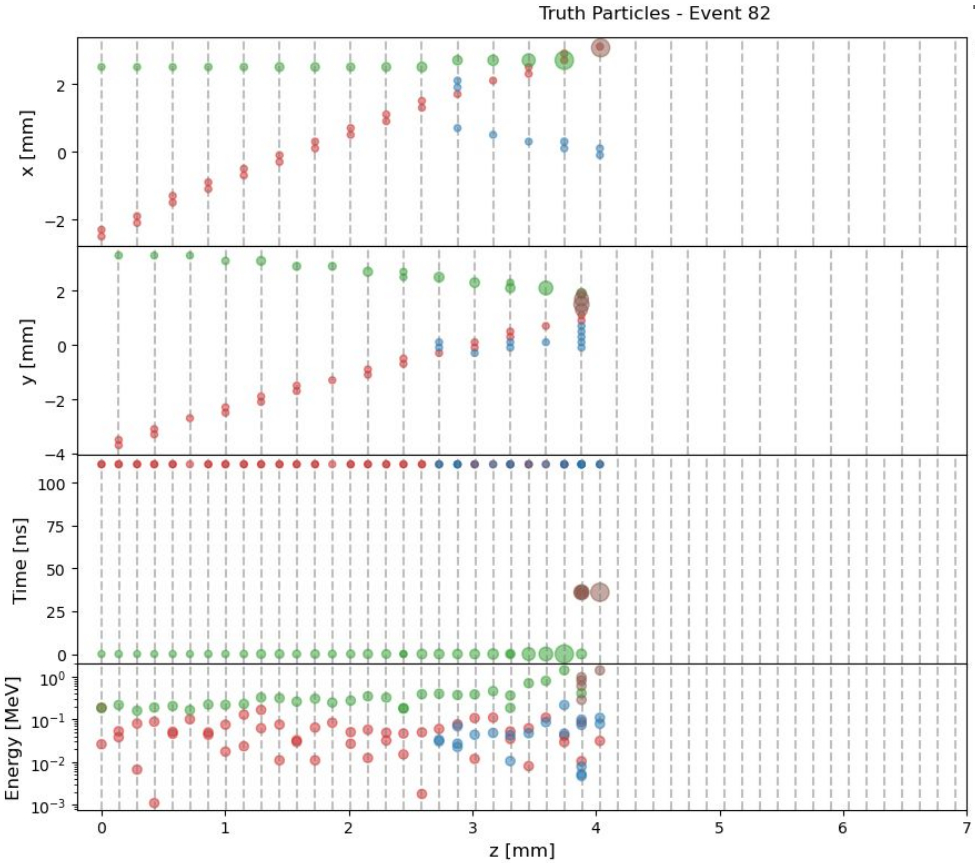
Pattern Finding performance by Particles in ATAR

- First order failure modes are:
  - Events with an electron
  - Large spatial “jumps” in tracklets(?)
- No event mixing
  - TODO: test performance on mixed event
- Idea to solve electron events:
  - Need pattern finder to look for particles branching off middle of tracklets (not just ends)
- ~~Idea to solve spatial jumps:~~
  - ~~Use timing information to try to group muon hits, not just spatial data~~
    - ~~Could be problematic for mixed events?~~



Example Failure: Electron Event



Truth:

Pattern 0: 4 tracklets
- Tracklet 0: EID=3473, PID=-11, Hits=52
- Tracklet 1: EID=3473, PID=211, Hits=31
- Tracklet 2: EID=3473, PID=11, Hits=20
- Tracklet 3: EID=3473, PID=-13, Hits=5

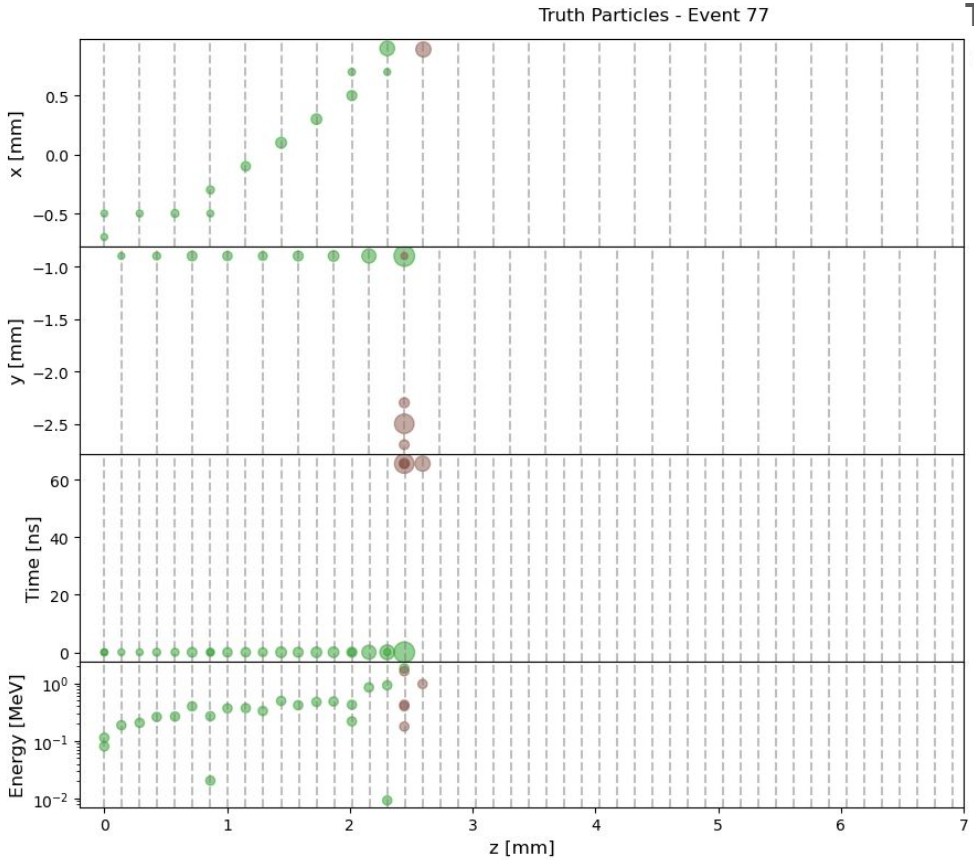
Reco:

Pattern 0: 3 tracklets
- Tracklet 0: EID=3473, PID=-11, Hits=52
- Tracklet 1: EID=3473, PID=211, Hits=31
- Tracklet 3: EID=3473, PID=-13, Hits=5

Pattern 1: 1 tracklets
- Tracklet 2: EID=3473, PID=11, Hits=20

Particle Types
- e^+
- e^-
- π^+
- μ^+

Example Failure: Large spatial Jumps



Truth:

Pattern 0: 2 tracklets
  Tracklet 0: EID=3453, PID=211, Hits=23
  Tracklet 1: EID=3453, PID=-13, Hits=5

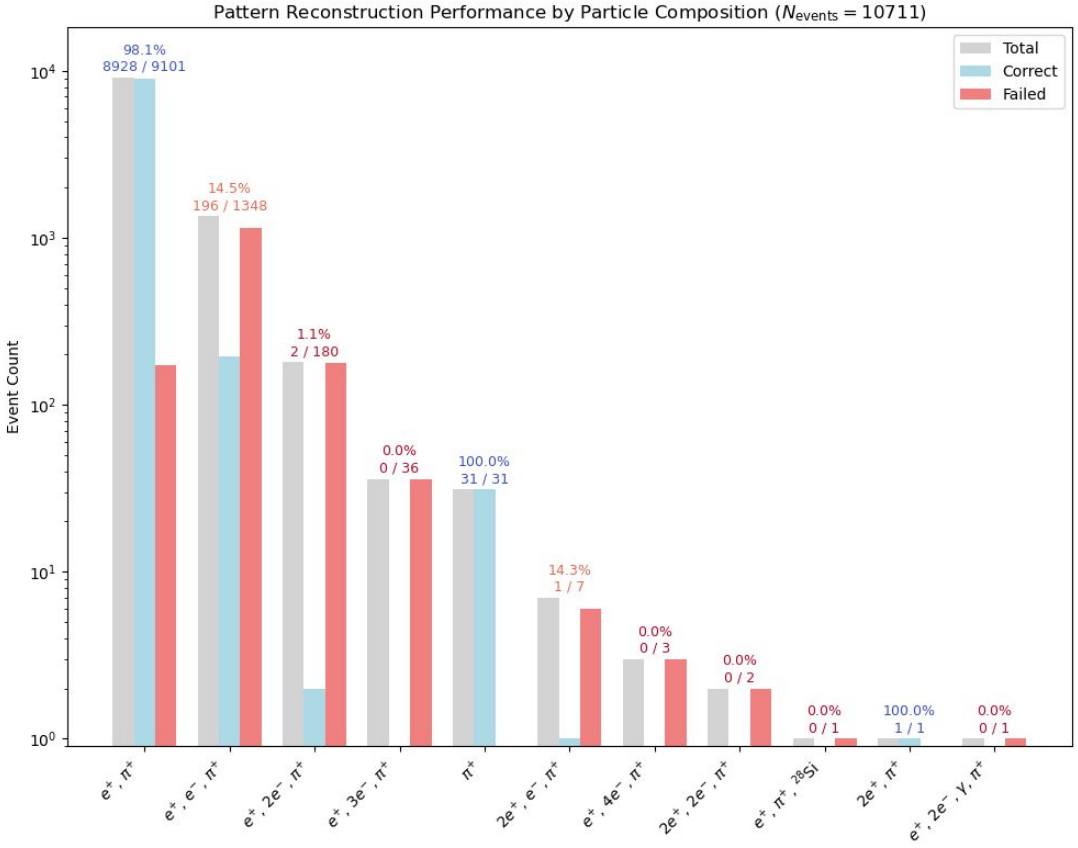
Reco:

Pattern 0: 1 tracklets
  Tracklet 0: EID=3453, PID=211, Hits=23
Pattern 1: 1 tracklets
  Tracklet 1: EID=3453, PID=-13, Hits=5

Particle Types
π^+
μ^+

Backups

Pienu decays



Pattern finding on electron events