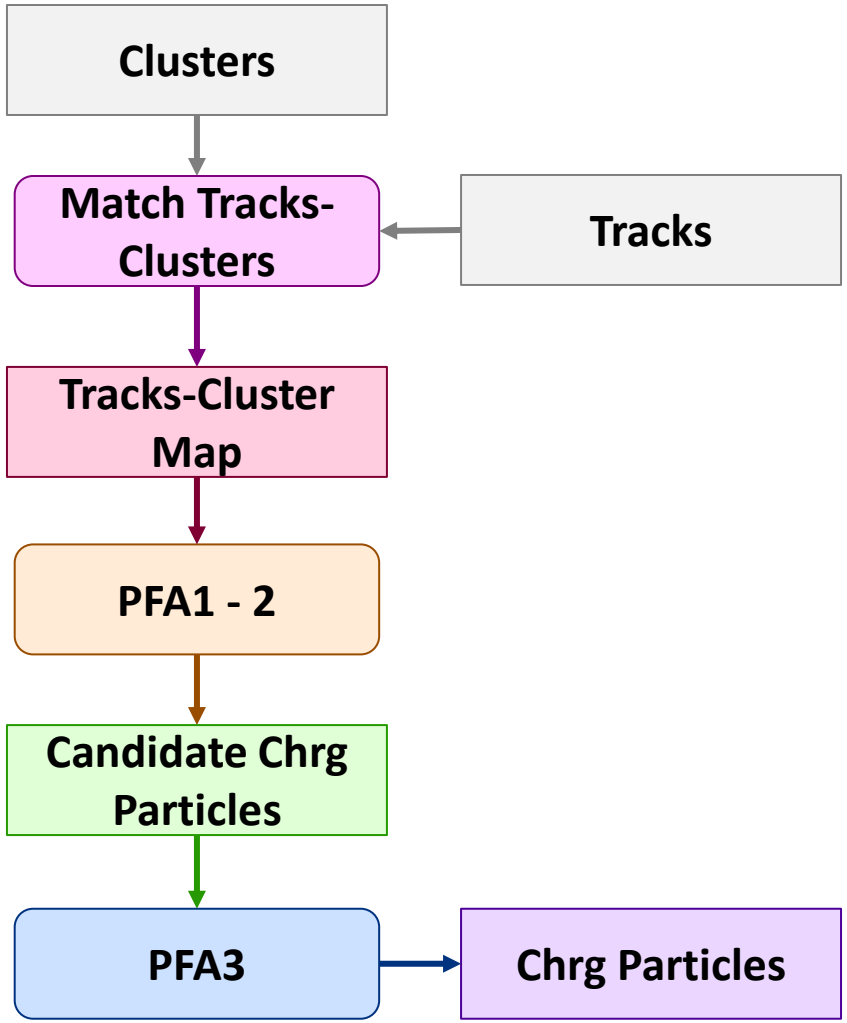
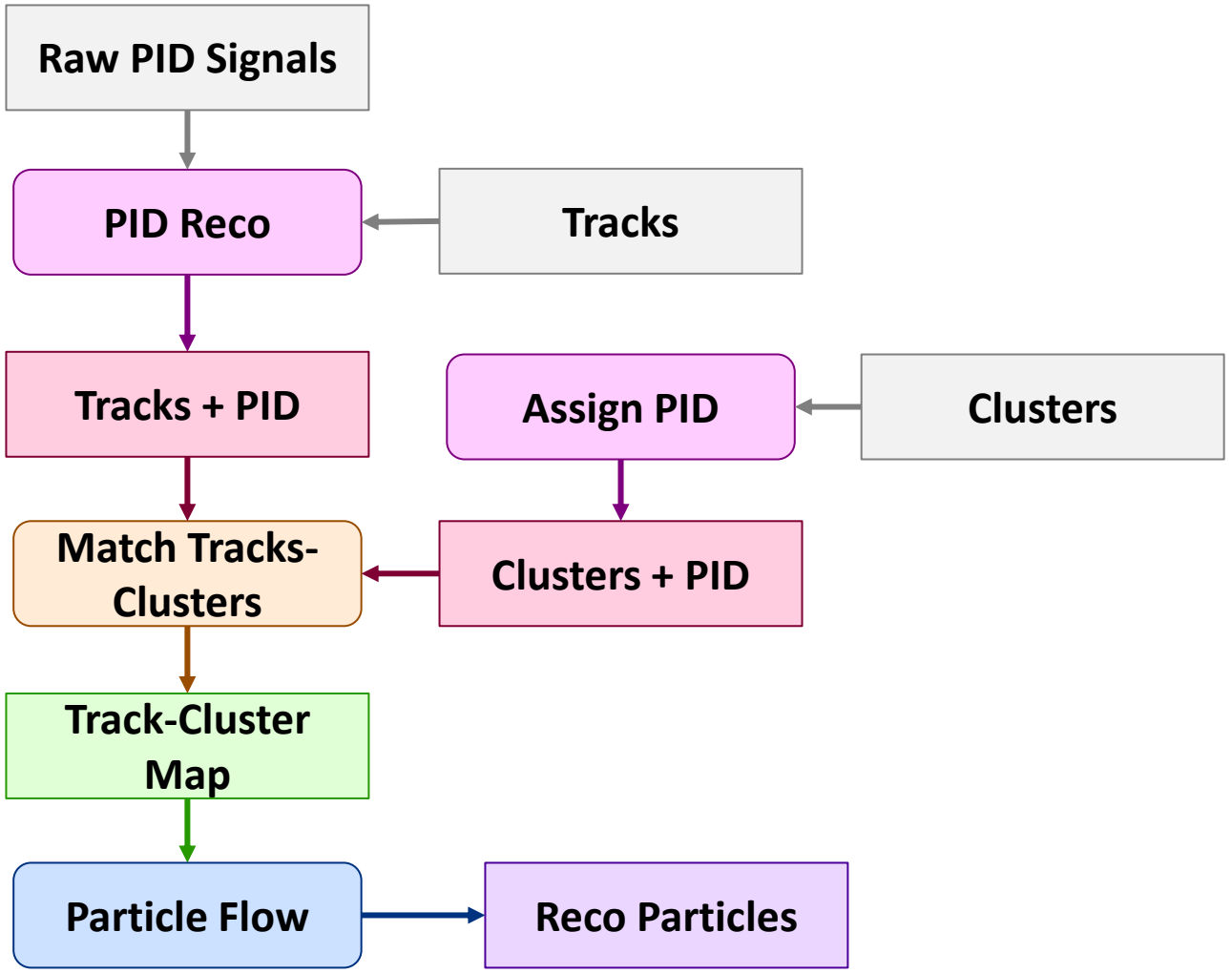
Track-PID Links | For PFA3

- **PFA3:** converts particle candidates to reco particles
  - Applies (rough) PID to particles based on info present
  - ⇒ Input is *tracks* (not *Charged Particles*!) + clusters
  - ∴ **PID hypotheses from LUTs not available**, see discussion on PR here
- **Two Options:**
  a) Route existing charged particles into PFA3
  b) Or introduce links to transport PID hypotheses along with tracks
- Former necessarily a stopgap (should have only particle candidates going in), **but latter may help w/ holistic PID (next slide)**



Track-PID Links | For Holistic PID

- **Right:** updated diagram from Reco WG-PID CCWG workfest
  - PID reco needs tracks as input, will output PID hypotheses (log likelihoods)
- Necessarily occurs upstream of any conversion from tracks to particles
  - ⇒ Also will need to transport tracks + PID hypotheses to holistic reco
  - ∴ **Track-PID links would also fill this need**
- **Alternative:** form (candidate) charged particles in PID reco
  - Seems awkward… Need extra steps to translate b/n charged particles & tracks when matching…



Track-PID Links | Possible Rollout

- **Right:** the proposed link
  - Ahead of full PID reco, could use LUTs to test machinery
  - ☞ I.e. modify *PIDLookup* algo to also output track-PID links

- **Currently not sure on timeline:**
  - Would be *nice* to have for PFA3, but can likely get by w/o for initial implementation
  - So could always put in as a follow-up later this year **(& take care of work already on our plates)**

☞ **Thoughts?**

edm4eic::TrackParticleIDLink:
Description: "Links a track to generated PID"
Author: T. P. Link
From: edm4eic::Track
To: edm4hep::ParticleID