

EFZero | Removing Truth Info from MatchClusters



- **MatchClusters**: current source of *ReconstructedParticles*, and one of our biggest truth info leaks!
 - Uses truth info to link tracks to clusters (cf. summary below)
 - Patching this leak is important for eID, jet reco, and *a lot* more!
 - ☞ See discussion at [2026 EIC UGM tracking workfest](#)
- *MatchClusters* is ambiguous, so will refer to this workflow as **EFZero (Energy-Flow Zero)**
 - Since this is an energy-flow-style algorithm, and it's "0th order" in terms of complexity
- ☞ **Luckily**: replacing truth info in EFZero is straightforward!

EFZero (A): with truth and reco info

1. Identify clusters linked to tracks (charged particles) with **mc-reco associations**
2. Remove any clusters linked to tracks
3. Convert remaining clusters into neutral particles
4. Save charged, neutral particles to output collection

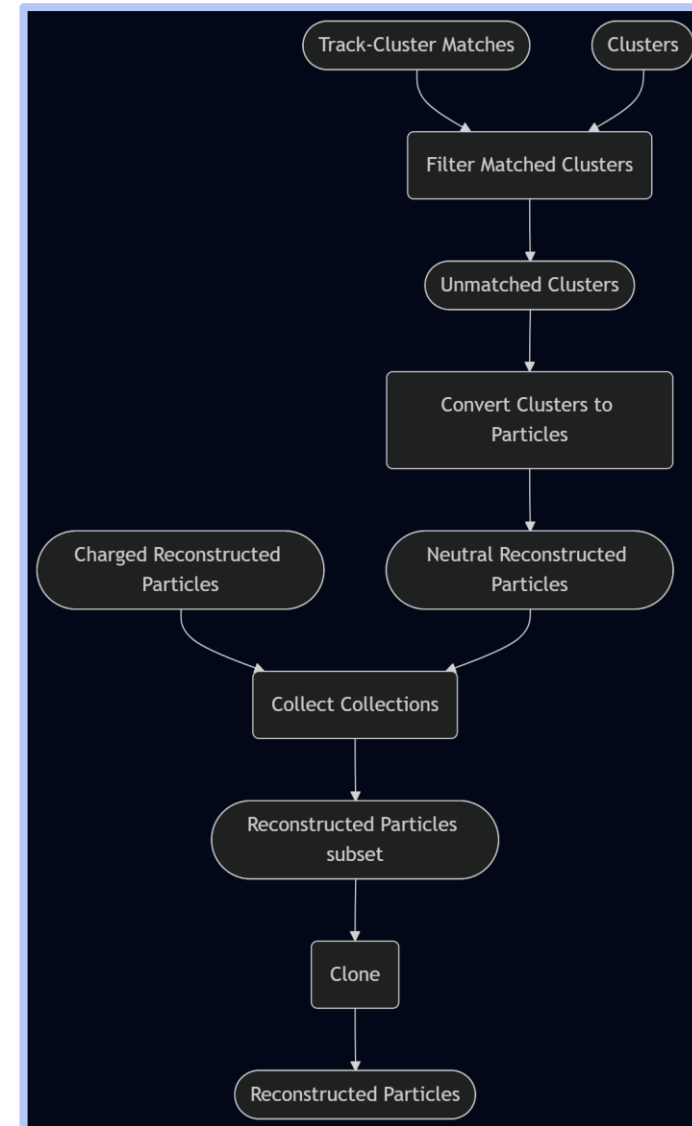
EFZero (B): with only reco info

1. Identify clusters linked to tracks with **track-cluster matches**
2. Remove any clusters linked to tracks
3. Convert remaining clusters into neutral particles
4. Save charged, neutral particles to output collection

EFZero | Reco-Only Version



- [EICrecon#2937](#) implements **EFZero (B)** in a sequence of algorithms (cf. right)
 - *ReconstructedChargedParticles* formed prior, so key part of EFZero is identifying neutrals
 - All necessary algorithms already implemented:
 - 1) Step 1 already handled by [TrackClusterMatch](#) (Tristan)
 - 2) Step 2 can be handled by [FilterMatching](#) (Simon)
 - 3) Step 3 can be handled by [ClustersToParticles](#) (Dima, Akio)
 - Since *CollectionCollector* returns a subset collection, can “upgrade” output to real collection with [Cloner](#) (Wouter)
- Next step will be comparing **EFZero (A)** vs. **(B)** outputs
 - In PR, EFZero outputs are labeled with a **Zero** in their name
 - ☞ **Note:** will *not* replace default *ReconstructedParticles* until absolutely ready!!



EFZero | Truth-And-Reco Version



- **EFZero (A)** already exists as *MatchClusters*, but may want to consider an intermediate step towards its deprecation
 - ∴ Its truth-based track-cluster matching is unique, would be good to preserve this functionality
 - ⇒ Can split *MatchClusters* into a sequence of algorithms similar to **EFZero (B)** (cf. right)
 - ⇒ Truth-based track-cluster matching would be split out as new algorithm
- Summarized this in issue [EICrecon#2936](#)
 - **Note:** change *should* (🙌) be completely transparent to the user, so can do ASAP
 - But could also do it in two steps
 - 1) Add new algorithm, outputs
 - 2) Remove existing after confirmation

