Clustering in Crystal ECAL with Arbor PFA: tuning parameters

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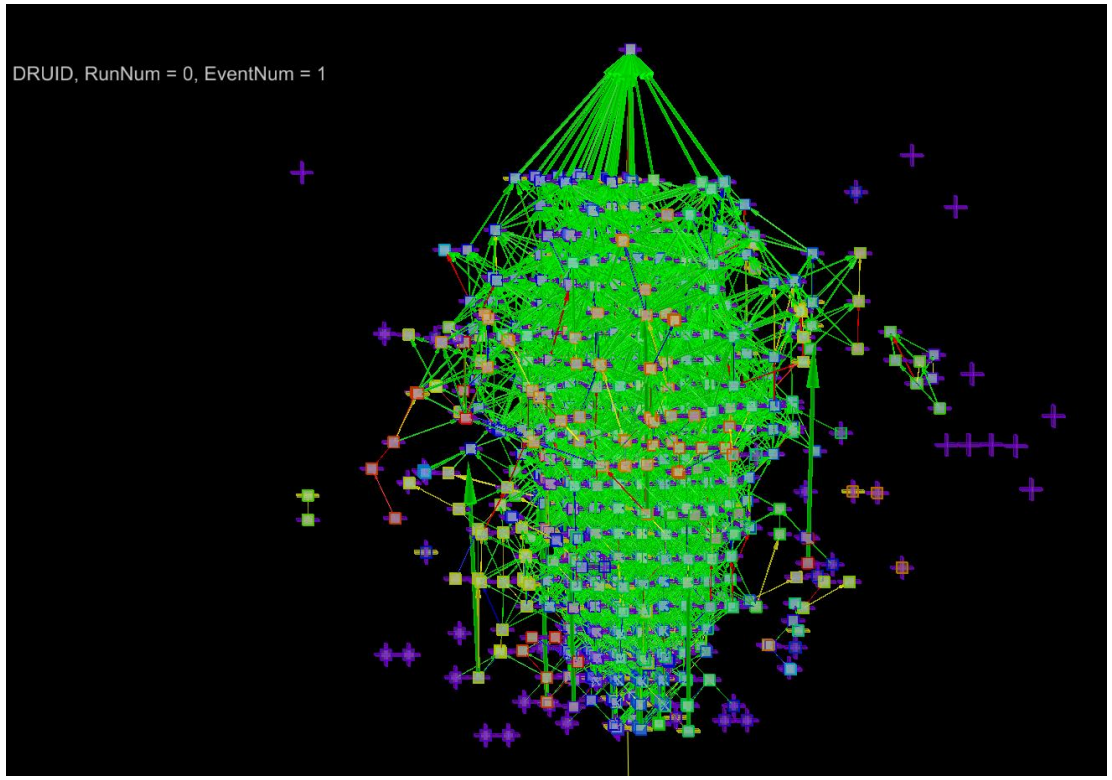
Crystal ECAL: clustering

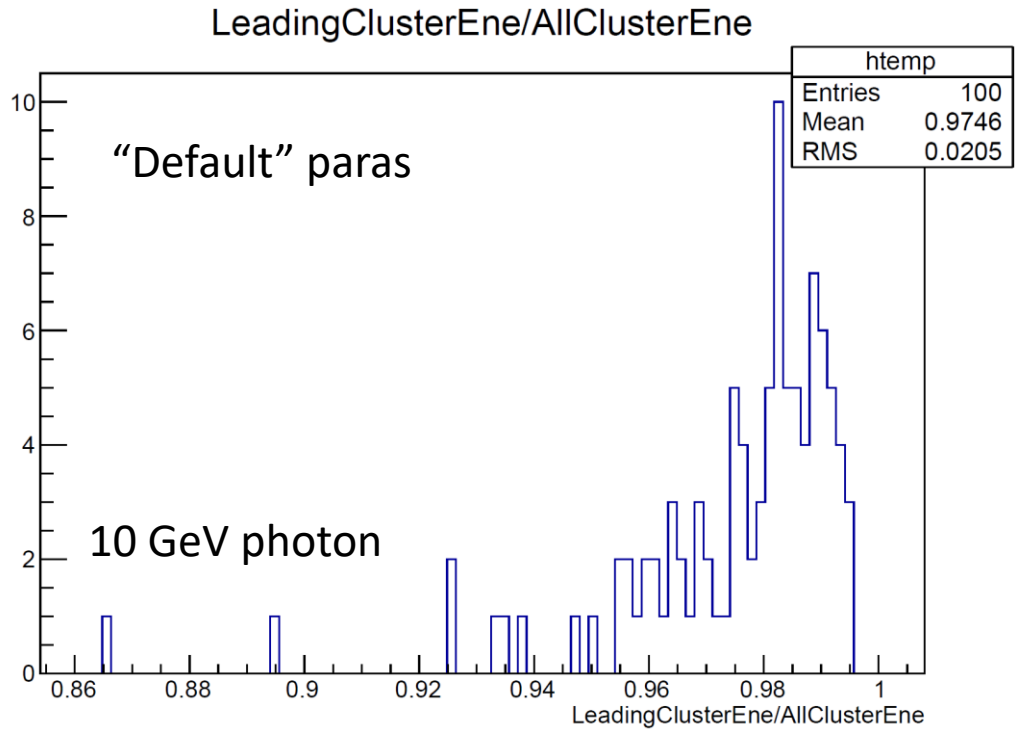
- Motivation
  - Check the PFA performance with crystal calorimeter
- Key questions at this stage
  - Clustering efficiency: e.g. single photons
  - Separation power: e.g. two photons
- CEPCsoft
  - Geometry crystal cubes
  - Digitiser: calibration constant = 1.0
- Parameters in ArborPFA: to be tuned
  - “BushConnect”
  - “Default” paras tuned for SiW ECAL

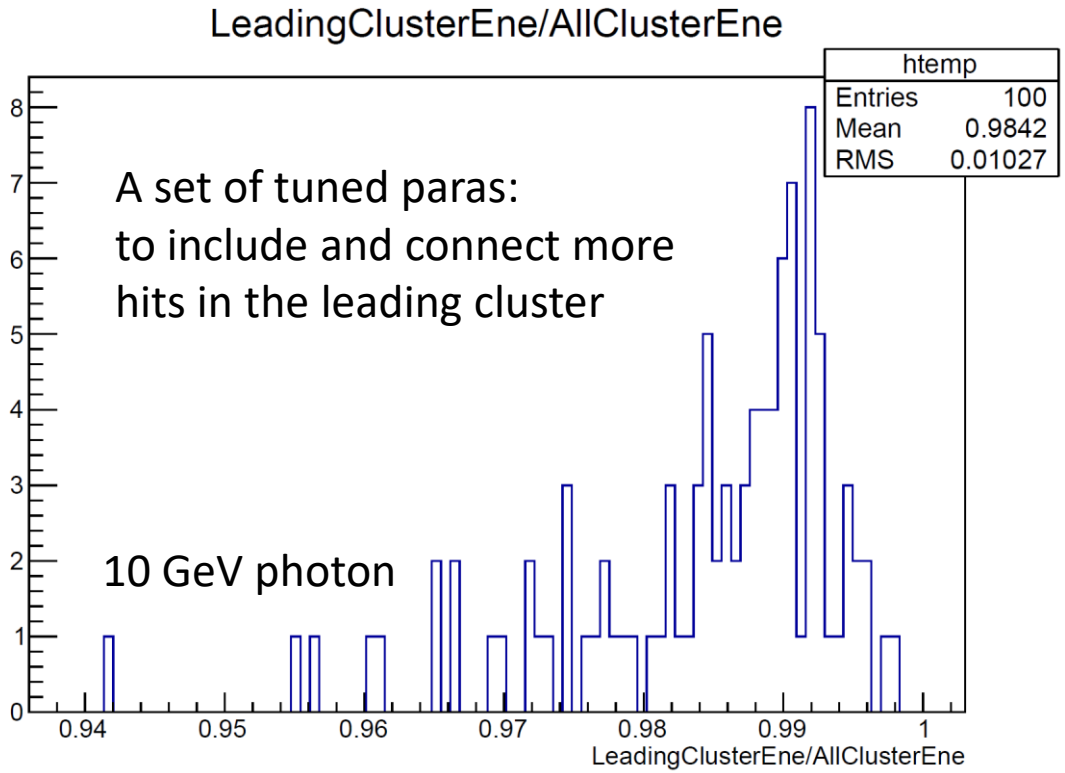


10 GeV photons after Arbor reconstruction

Clustering efficiency: first studies

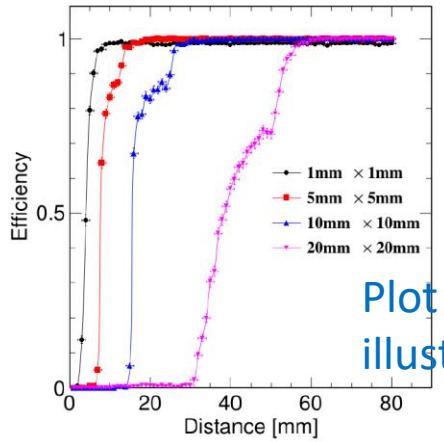
- Single photons: clustering efficiency
  - Tune Arbor BushConnect parameters
  - Efficiency definition: energy ratio of the leading cluster and all clusters





Separation power: to be done

- Separation power
  - Will use two photons, varying incident positions
- Clustering efficiency and separation power
  - “Too high” clustering efficiency may lead to lower separation power
  - Need to optimize in the 2 dimensions



Plot in CEPC CDR: illustration only

Figure 3: Reconstruction efficiency of di-photon samples at different cell size. The distance of the photons is scanned from 1 to 80 mm.