dRICH Benchmarks

General notes

- All benchmarks should be done for electrons, pions, kaons, and protons.
- Many of these are independent “analysis algorithms” in our PR for IRT in EICrecon

Plots

- General PID, each with: 1D distributions, 2D vs. momentum, and 2D vs. eta:
  - Number of incident photons (before digitization and QE)
  - Number of photoelectrons (after digitization)
  - Reconstructed Cherenkov angle (theta)
  - Theta residual
  - Highest PID likelihood
- Reconstructed 2D distribution of photon theta vs. phi
- MC truth info:
  - MC photon wavelength
  - MC photon refractive index (at vertex)
- Digitization
  - ADC
  - TDC
  - TDC vs. ADC
  - Need to implement Time-over-Threshold (ToT)
- Track projections
  - projected `TrackPoints` in dRICH radiators
  - TODO: compare to “true” tracks (from photon vertices)
- TODO: Performance plots (vs. momentum, eta, etc.)
  - single photon RMS
  - Nsigma vs. p