Pandora and CAFs
ND-LAr and 2x2

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Pandora Status

- Currently not producing CAFs as major output.
  - Comparatively limited development occurred while missing key information in input files to actually make use of them.
- Practically, our original CAF making design worked through LArSoft objects.
  - We've now moved to an independent intermediate, simple ROOT format.
- Intention:
  - Pandora developers use large, high information intermediate format to quantify performance and optimise.
  - Production produces CAFs from the intermediate format.
  - Analysers use CAFs for high-level work.

Pandora Intermediate Format

- Intermediate ROOT reconstruction format currently contains:
  - All hits.
  - List of tracks.
    - With links to hits.
    - Properties: start, end, energy etc.
  - List of showers.
    - With links to hits.
    - Properties: start, end, energy etc.
  - Neutrino vertex candidates.
- Does not currently contain, but will:
  - Truth information.
    - GENIE and GEANT.
  - Particle hierarchy.

Pandora CAF Outputs

- Currently fill:
  - List of tracks.
  - List of showers.
  - Nothing else.
- Need to add:
  - Neutrino “life story” information.
    - Slicing.
    - Vertex locations, parent particles, daughter particles,
  - MINErVA/TMS (at some point).
- Analysers can choose to use our neutrino “biographies” or build their own.
- Currently neutrino slicing is optional.
  - Can write a single spill/event as one total tree entry, or as one tree entry per neutrino.

Going forward.

- Flow files with all relevant information now available(ish).
- This brings the CAF production back to the top of the priority list.
  - But also a lot of other things.
- First goal:
  - Integrating and testing truth information, quantifying reconstruction performance at hit level (using intermediate file format).
- Second goal:
  - Producing CAFs that can be provided to analysers.
    - Following StandardRecord updates.