

Changes to photon detector reconstruction

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Photon detector reconstruction

- `OpFlashFinder_module.cc` – creates `OpHits` and `OpFlashes`
- `OpFlashAlg.{h, cxx}` – contains functions that construct `OpHits` and `OpFlashes`
- `OpHitFinder` – folder containing pedestal and hit finding algorithms

Motivations to split OpFlashFinder_module

- Constructing OpHits and OpFlashes should be two separate steps in reconstruction
- We need it for DUNE 35t:
 - Our PD electronics (SSPs) output hit-like information (pulse area, time, etc.) in addition to waveforms
 - Expected rates make it impossible to record waveforms during continuous readout
 - We plan to write a module that will construct OpHits directly from information provided by SSPs

Suggested changes

- Create `OpHitFinder_module.cc` and move there code for constructing `OpHits` from `OpFlashFinder_module.cc`
- Create `OpHitFinder/OpHitAlg.{h, cxx}` and move there code from `OpFlashAlg.{h, cxx}`
- Create an entry for the new module in `opticaldetectormodules.fcl`

Changes in results

- Results may slightly change, because some information for `OpFlash` was obtained from the `OpHit` loop
- I obtained identical time distributions from a quick DUNE simulation (further testing required)

Breaking changes

- FHiCL files need to have the new module (`ophit`) added to them, and `opflash` parameters adjusted
- I've done that for `dunetpc`
- Not sure what to do with `uboonecode` (they have a separate photon detector reconstruction system that may conflict with my changes)

Feature branches

- larana
 - feature/gvsinev_SplitOpFlashFinder
- dunetpc
 - feature/gvsinev_SplitOpFlashFinder
- uboonecode
 - No branch yet, need to make one
 - Have a conflict: OpHitFinder_module.cc already exists in uboonecode