- Recently taken on responsibility for co-ordinating ECal reconstruction software

- Initially as the link between Italy and the rest of the ECal software group, the role has now expanded to encompass the wider reconstruction and calibration effort for the calorimeter

- This role may change with time, as other new members find their place in HPS, or should the work naturally overlap with other areas, but at the very least will involve these two areas

- Looking to get stuck in by identifying tasks and available people, and defining an initial work plan as quickly as is practical

Reconstruction

- Reliable reconstruction is required to perform meaningful analysis and realise the full potential of the experiment

- Some of the tools already exist (but not all bespoke for HPS...?)

- Not looking to re-invent the wheel if suitable tools are in place

- Gaps must be identified and filled

- A list of general ECal software tasks was recently defined, including reconstruction and calibration tasks

- Full list on confluence, but by no means comprehensive
  https://confluence.slac.stanford.edu/display/hpsg/Ecal+Software+tasks

- Reconstruction: Testing cluster algorithms, evaluate sampling fraction

- Calibration: Track based calibration, Pi0 reconstruction, Cosmics, Single electron scattering

- Tightly integrated with calibration and analysis, reconstruction takes the raw ADC values from events satisfying the trigger conditions and converts this information into the physical quantities used in analysis

- To do this, several things are required, such as

  - Clustering algorithms

  - Interpretation of clusters as particles

  - Calibration constants

  - ...

- Particles interacting in the ECal will generally deposit energy in several adjacent crystals, forming clusters
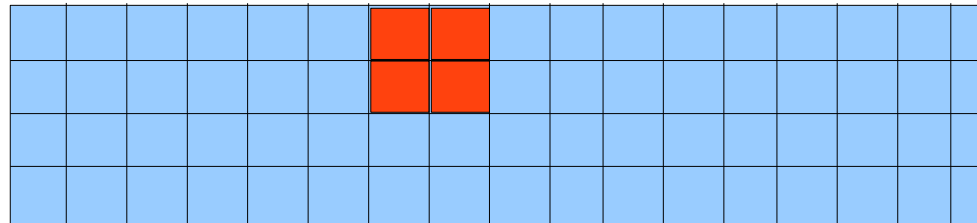
- Different particles will produce distinct cluster signatures, with differing energy spreads and different numbers of crystals in the cluster

- Clustering algorithm will be used to interpret these clusters as particular particles in ECal reconstruction

- Tasks: Verify what we have, fill in gaps, reimplement something more comprehensive if necessary

- Clustering can only take us so far, full event reconstruction requires reliable calibration
- With the online monitoring, a first-order calibration will already be in place, allowing clusters to to be identified as candidate particles
- Full offline calibration on well-known processes (e.g. neutral pions, electron scattering, cosmic rays) will allow raw ECal data to be interpreted in physics analyses
- This may be split into parallel efforts for each channel, or taken on by one person, but should decide soon and assign the work

- I will be attending the upcoming software workshop after the next collaboration meeting, and will try my hardest to persuade as many of the people involved in ECal reconstruction as I can to attend too

- Hoping to use the time as effectively as possible to push the effort on

- This means getting newcomers (myself included) up to speed on HPS software ahead of time, to minimise the time spent on basics

- Would also hope to start people working with some simple examples with test data/simulation and have definite goals for the week