ECal Software; Set up, Monitoring and Calibration

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Outline

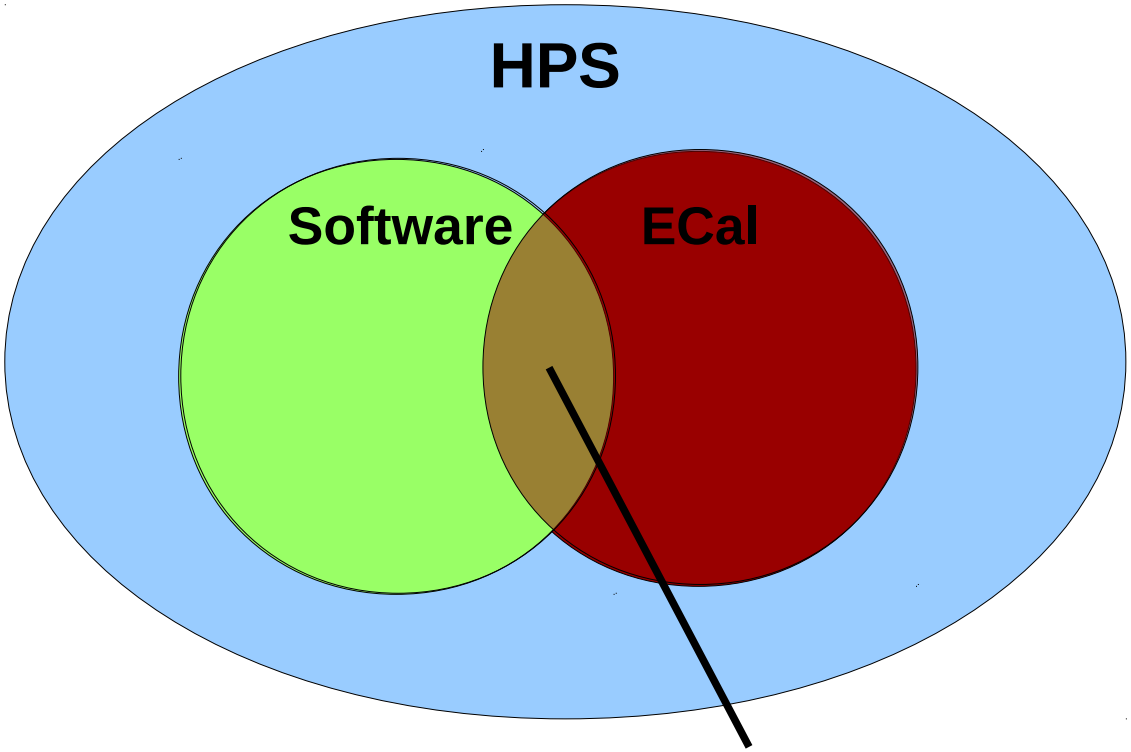
- Introduction
- Software Tasks, Assignments and Schedule
- Monitoring
- Calibration
- Recent Progress
- Summary and Outlook

Introduction

- Significant recent efforts in the organisation of the ECal software project
- Aided by a moderate influx of new collaborators in the final months of 2013
- An ECal software co-ordinator was recently appointed (me), as part of efforts towards the ECal group taking on responsibility for the simulation and reconstruction toolchain
- From these steps, the plan is to have all necessary components in place and tested in time for installation

Scope

- What do we mean by ECal software?



“ECal software” covers software activities relating to the simulation, reconstruction, monitoring, calibration and triggering of the HPS ECal

ECal Software Tasks

- Step 0 – identify tasks coming under the remit of ECal software
- List not exhaustive, shown here for guidance
  - Simulation
    - GEANT4 geometry updates
    - Digitization and electronic noise
    - Production of data for the group
    - Maximum energy in a crystal
  - Reconstruction
    - Testing cluster algorithms
    - Evaluate sampling fraction
    - Cluster position corrections, for electron, photon and positron
    - Cluster timing
    - Cluster pattern
    - Matching with tracking
    - Verify clustering algorithms
    - Study different clustering algorithms

ECal Software Tasks (cont.)

- Monitoring
  - Light monitoring system and software
  - Occupancy and rates
- Calibration
  - Track based calibration
  - π^0 reconstruction
  - Cosmic triggering and calibration
  - Single electron scattering
  - Position corrections
- Trigger Studies
  - Understanding trigger algorithms at board and crate level
  - Rates of physical noise
  - Algorithm optimization
- Online Software
  - Trigger monitoring
  - ECal data quality check

ECal Software Tasks

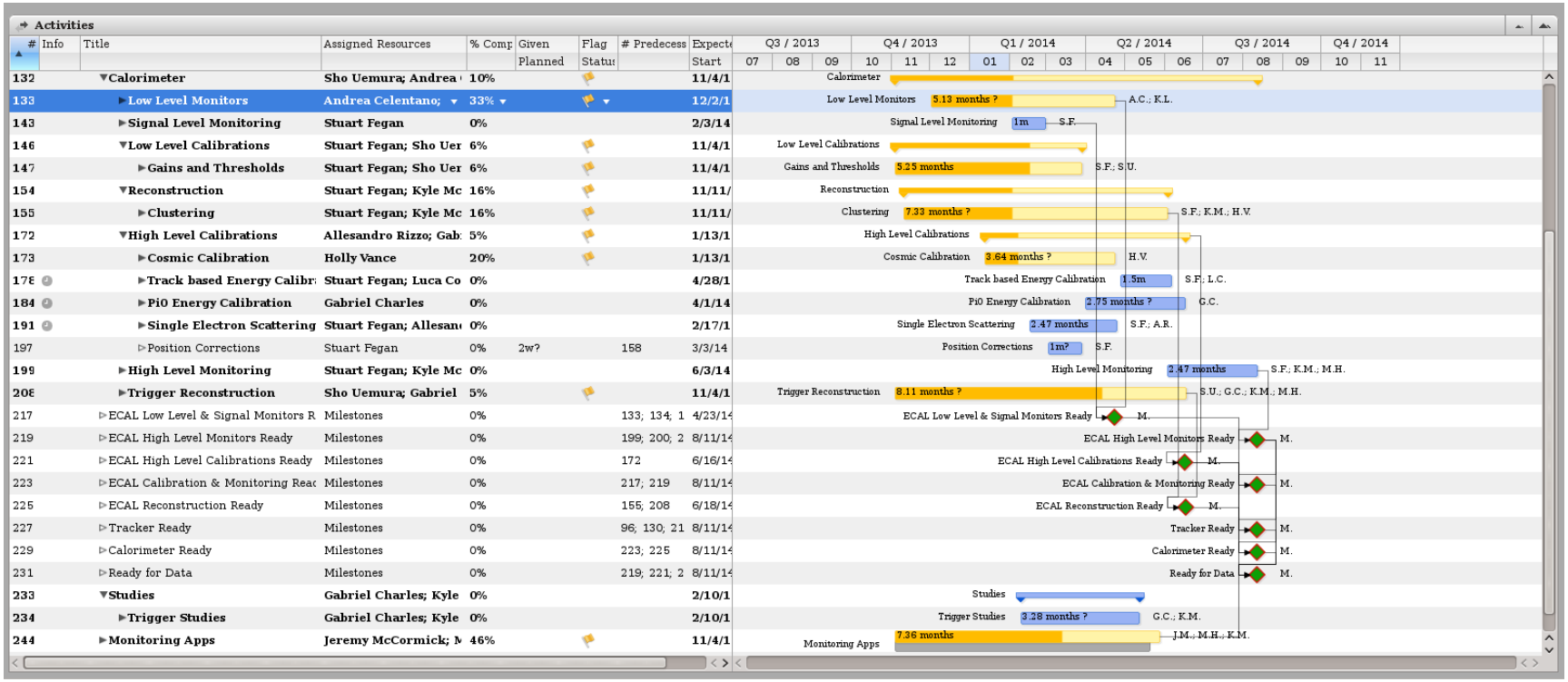
- Step 1 – Task assignments
- Final assignments in progress
  - Simulation
    - GEANT4 geometry updates – Daria Sokhan (Glasgow)
    - Digitization and electronic noise – Gabriel Charles (IPN Orsay)
    - Production of data for the group – Gabriel Charles (IPN Orsay)
    - Maximum energy in a crystal
  - Reconstruction
    - Testing cluster algorithms – Kyle McCarty (UNH)
    - Evaluate sampling fraction – Stuart Fegan (INFN Ge)
    - Cluster position corrections, for electron, photon and positron
    - Cluster timing
    - Cluster pattern
    - Matching with tracking
    - Verify clustering algorithms – Kyle McCarty (UNH)
    - Study different clustering algorithms – Holly Vance

ECal Software Tasks (cont.)

- Monitoring
  - Light monitoring system and software – Andrea Celentano (INFN Ge)
  - Occupancy and rates – Andrea Celentano (INFN Ge)
- Calibration
  - Track based calibration – (INFN Ro2)
  - π^0 reconstruction – Gabriel Charles (IPN Orsay)
  - Cosmic triggering and calibration – Holly Vance
  - Single electron scattering – (INFN Ro2)
  - Position corrections
- Trigger Studies – K. McCarty & G. Charles
  - Understanding trigger algorithms at board and crate level
  - Rates of physical noise
  - Algorithm optimization
- Online Software
  - Trigger monitoring – Kyle McCarty (UNH)
  - ECal data quality check

Schedule

- Several tasks already well under way, or completed
- More details available in the software schedule



Software Workshop

- Several collaborators involved in ECal software are attending the software workshop this week
- An ideal opportunity to push ECal software forward, and disseminate knowledge on HPS software back to our respective groups
- This will be particularly useful for those of us in Europe where the time difference with experts here can be frustrating.

Summary and Outlook

- The attention of the ECal group is now turning to ensuring that the required software will be ready and available in time for experimental running
- The management framework is now in place for effective communication between the ECal software project and the wider HPS software and ECal groups
- Tasks and scheduling are coming together, with a few tasks remaining to be assigned to willing collaborators
- Ready to push on and redouble our efforts for the challenges ahead