MAUS Status

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MICE CM 40

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AT THIS CM

- Tracker (Dobbs)
- Global
  - Tracking (Greis)
  - PID (Pidcott)
- Ckov (Cremaldi)
- EMR (Drielsma)
- Grid & CDB (Martyniak)
- Joint Analysis/Software parallel
  - Tracker Emittance Reconstruction (Hunt)
  - KL MC (Nugent)
  - Geometry (Bayes, Rogers)
  - Reconstruction quality (Rogers)

SINCE CM 39

- KL MC tuning and updates (Nugent/Bogomilov)
  - Updated calibrations and smearing, calibrations now in CDB
  - Mismatch on the tails has vastly reduced
- EMR MC & Reconstruction (Drielsma)
  - MC Digitizer and Track reconstruction nearly ready for release
  - Issue with memory access resolved (yesterday)
  - Includes first version of track & range reconstruction
- Tracker optimization (Dobbs/Santos)
  - Improvements to Kalman
- Global PID framework updates (Pidcott)
  - Added Ckov and KL as PID inputs
- Ckov Reconstruction (Drews/Winter)
  - Several bug fixes
  - Improved pedestal estimation, new & better pulse-finding algorithm
- Improvements to TOF calibration interface (Rajaram)
  - Retrieve calibrations by run-number
  - TOF calibrations from recent run with FPGA trigger now in DB

Since CM 39

- GEANT
  - Added ability to set production threshold by region/volume
  - Added LiH material defitnition
- Geometry
  - Decision on geometry implementation – GDML modules (talks by Bayes, Rogers)
- Fixed memory leaks
  - Was holding up batch processing. GRID seems happy so far

ISSUES

- Tracker
  - Real data reconstruction broke at some point, likely in the unpacking of DAQ data. Need this resolved for cosmics/ testing.
- Ckov
  - MC simulation missing, getting pushed back due to lack of resources
- GEANT
  - LiH density = ?
- Infrastructure
  - CDB missing chunks of runs, someone needs to populate it from the Run Plan Spreadsheet

STATUS & PLANS

- MAUS paper in preparation
  - Scope is description of architecture, simulation and reconstruction functionalities.
  - Batch processing framework, computing infrastructure are not included
  - Some detector software sections need revisions and inputs from detector groups
- Starting to think about MAUS from an analysis viewpoint
  - Physics Block Challenge (Bayes)
  - Reconstruction quality – is this reconstruction "analyzable"? (Rogers)

Test Coverage (Python)

Module	Coverage
CallG4BL	6%
MapPyBeamLineSimulation	5%
MapPyScalersDump	45%
ReducePyCkovPlot	61%
ReducePyKLPlot	54%
ReducePyTofCalib	54%
ReducePyTOFPlot	3%
docstore.MongoDBDocumentStore	41%
framework.input_transform	23%
framework.merge_output	65%
geometry.CADImport	65%
geometry.LocationFit	54%

- Overall line coverage: 68%

Test Coverage (C++)

Module	Coverage
common_cpp/API	33%
common_cpp/DataStructure	27%
common_cpp/DetModel/EMR	2%
common_cpp/DetModel/SciFi	62%
common_cpp/JsonCppStreamer	57%
common_cpp/Recon/Bayes	52%
common_cpp/Utils	67%
input/InputCppDAQData	57%
input/InputCppDAQOnlineData	2%
map/MapCppTrackerDigits	48%
map/MapCppGlobalReconImport	37%
reduce/ReduceCppPatternRecognition	67%

- Overall line coverage for non-legacy: 79% has gone up (was 75%)

SCHEDULE
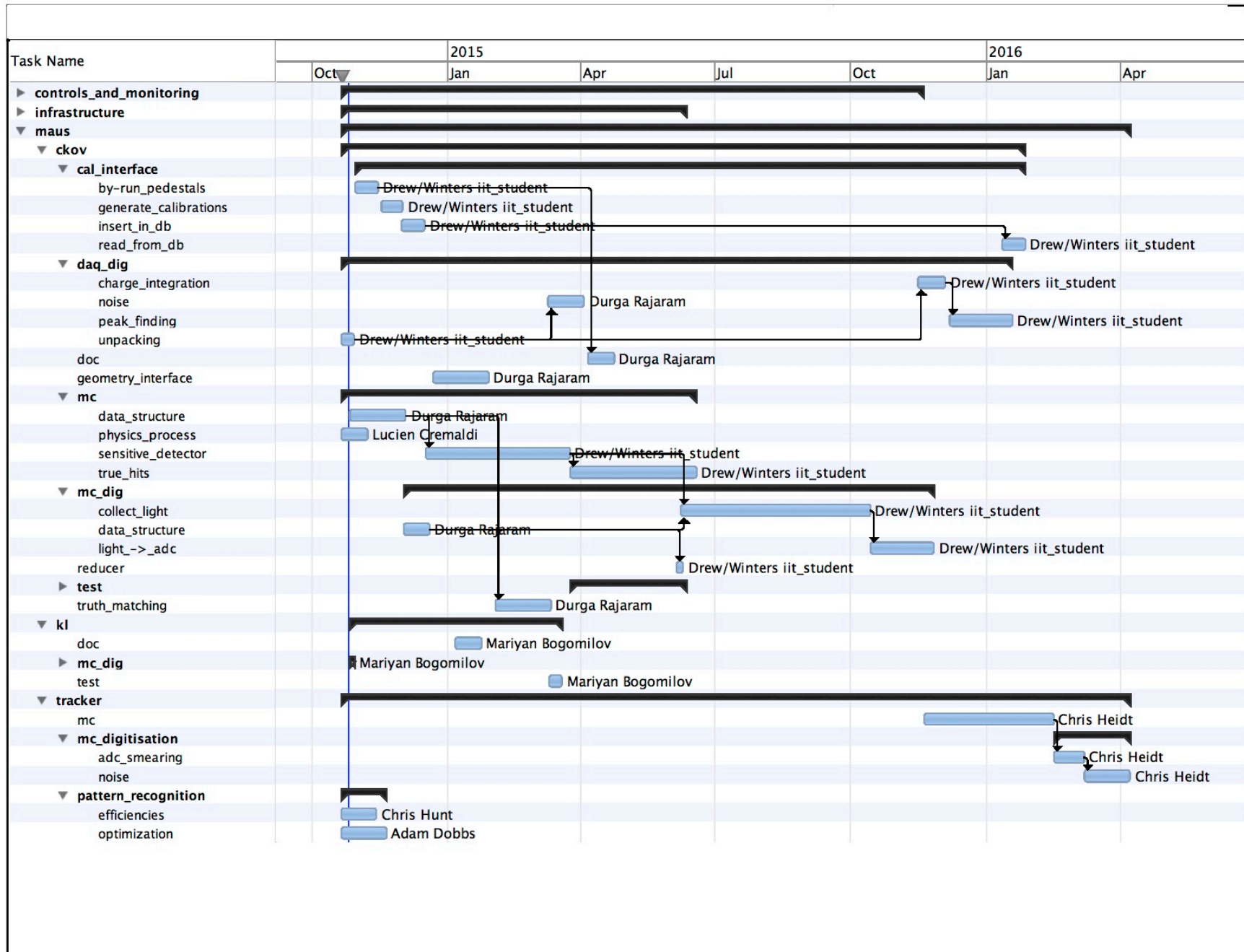
Summary

- Overall the reconstruction is in good shape
  - \+ EMR digitization & range reconstruction
    - ✓ Can reconstruct all detectors
  - \+ Improved Ckov reconstruction
  - \+ Improvements to tracking
- Resolution on geometry implementation
- – Some remaining issues
  - – Real data SciFi reconstruction
  - – Ckov MC
- MAUS paper in draft
- Can we do real physics with MAUS?
  - – "Physics Block Challenge" – see talk by Ryan Bayes