Offline

Durga Rajaram

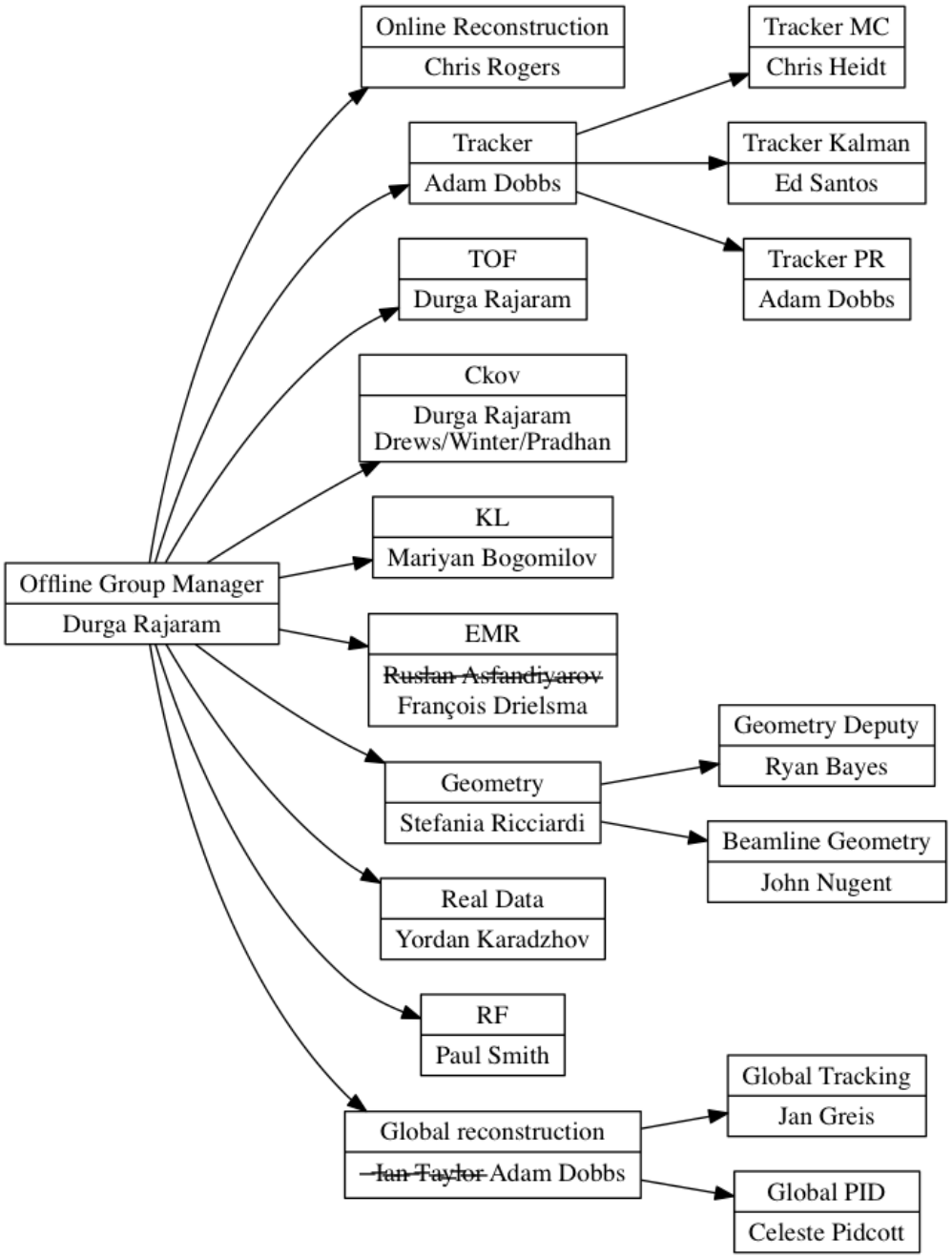
MICE CM39

June 27 2014

OVERVIEW

- Updates since previous CM
- Issues
- CM39 wrap-up
- Status
- Risks & Priorities

ORGANIZATION



Changes since CM38

- EMR
  - François Drielsma replaced Asfandiyarov
- Ckov
  - Winter, Drews, Pradhan Undergraduate students at IIT and UMiss
- Global
  - Jan Greis replaced Peter Lane
  - Adam Dobbs replaced Ian Taylor as head

SINCE CM38

- Progress:
  - KL Digitizer has been added
  - EMR geometry finalized & true hits added
  - G4BL added as an third party option to generate MC beam
  - Major API changes for data type conversions
  - Tracker updates & improvements
  - Progress on Global PID framework
  - Geometry updates & improvements
  - Progress on EMR reconstruction, Digitization
  - Progress on Ckov calibration

Issues

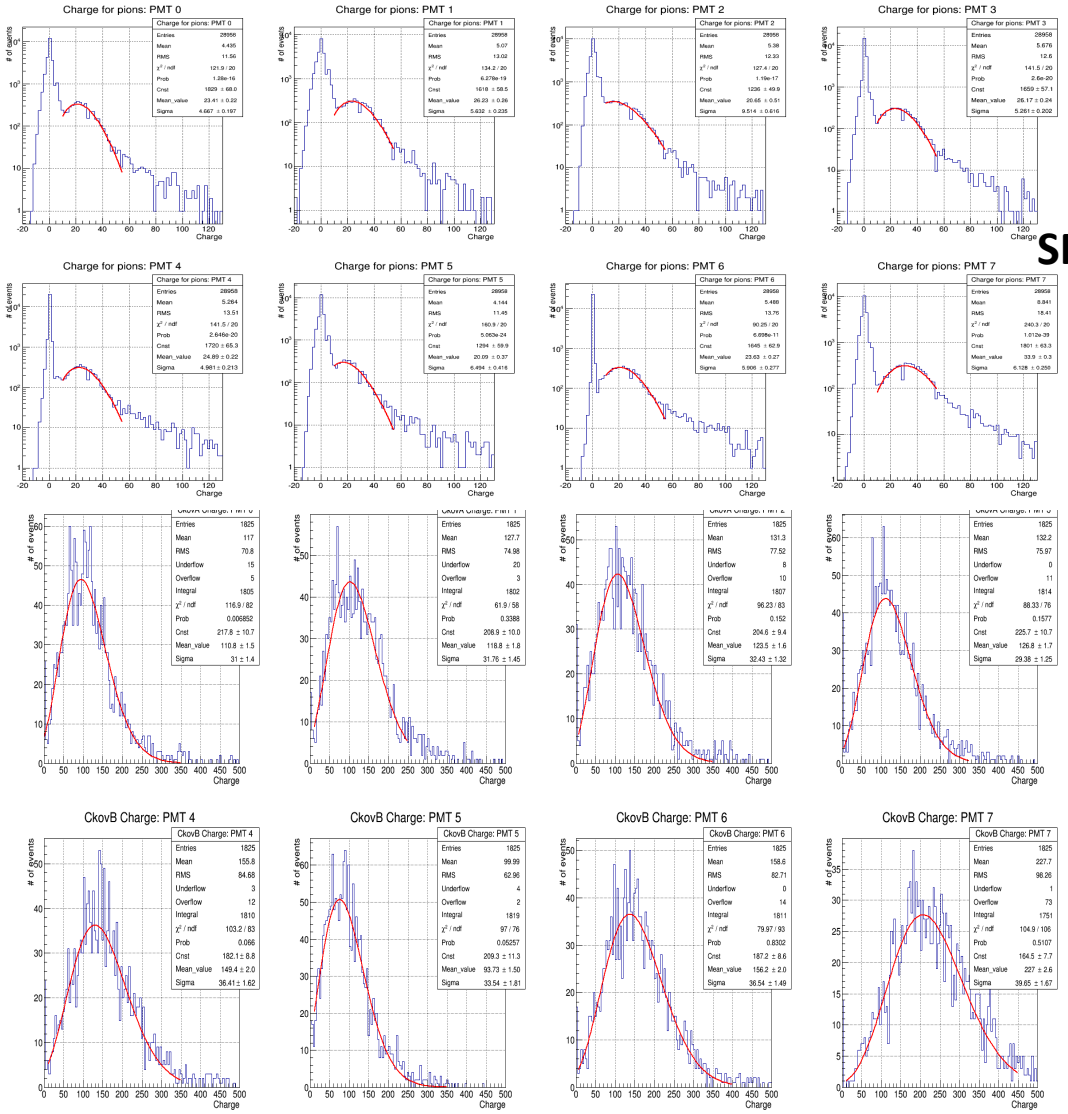
- Memory leak
  - Urgent
  - This is holding up batch reconstruction and likely affects online reconstruction as well
- Python code coverage has dropped a little, need to get this back up

WORK IN PROGRESS (WRAP-UP)

- At this CM we heard from
  - TOF
  - Ckov
  - Tracker
  - EMR
  - Global
  - Geometry
  - G4BL-MAUS
  - Batch & CDB

CKOV (CREMALDI)

- Progress on calibrations
- Found some PMTs are not balanced
  - HV & momentum scan part of this weekend's run plan
  - Need to get calibrations into CDB once final, so reconstruction can use them
- Efficiency studies in progress
- MC Geometry description has been revised.
  - Need hit collection and digitization
  - Will fill the last hole in MC detector simulation



KL (Bogomilov/Nugent)

- KL Digitizer now available
- Tuning in progress

KL Product Spectrum

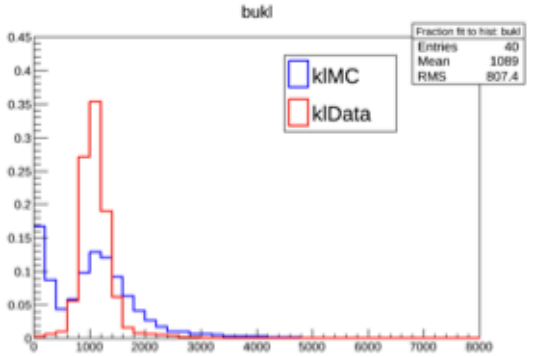


Figure : Data & MC (smear factor 3) (6, 200) μ^+ beam

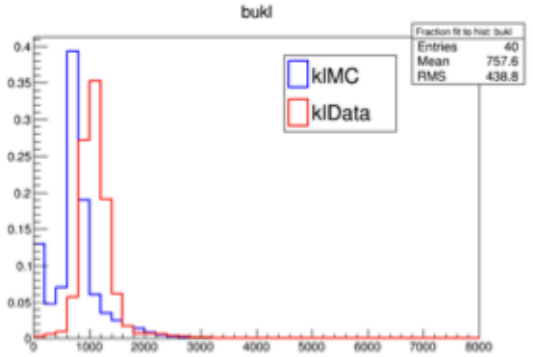
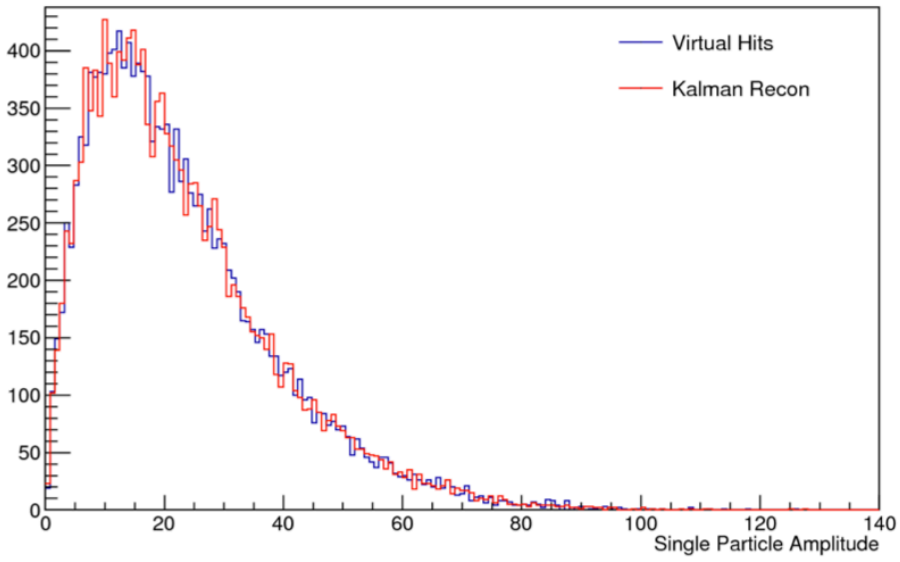


Figure : Data & MC (smear factor 1) (6, 200) μ^+ beam

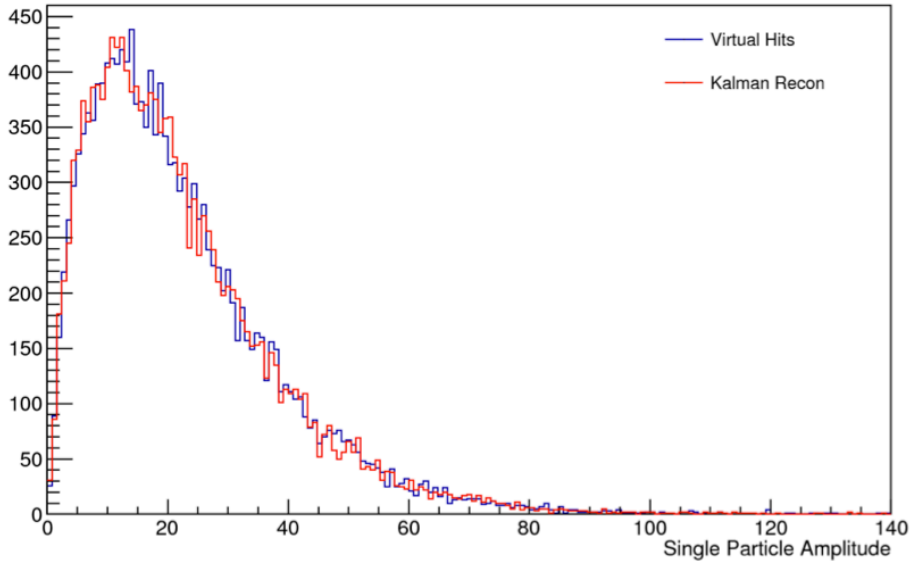
- Converging on correct tune for digitizer. To simulate lower thresholds will have to define KL volume as special Geant volume - to avoid memory crash.

TRACKER (DOBBS//HUNT)

- Reconstruction complete
- Optimizations and improvements ongoing
- Data structure updated to handle DAQ input
- Improved test coverage
- MC emittance reconstruction shows excellent agreement
- To do: efficiency studies, online reconstruction plots, calib/geometry-CDB interfaces



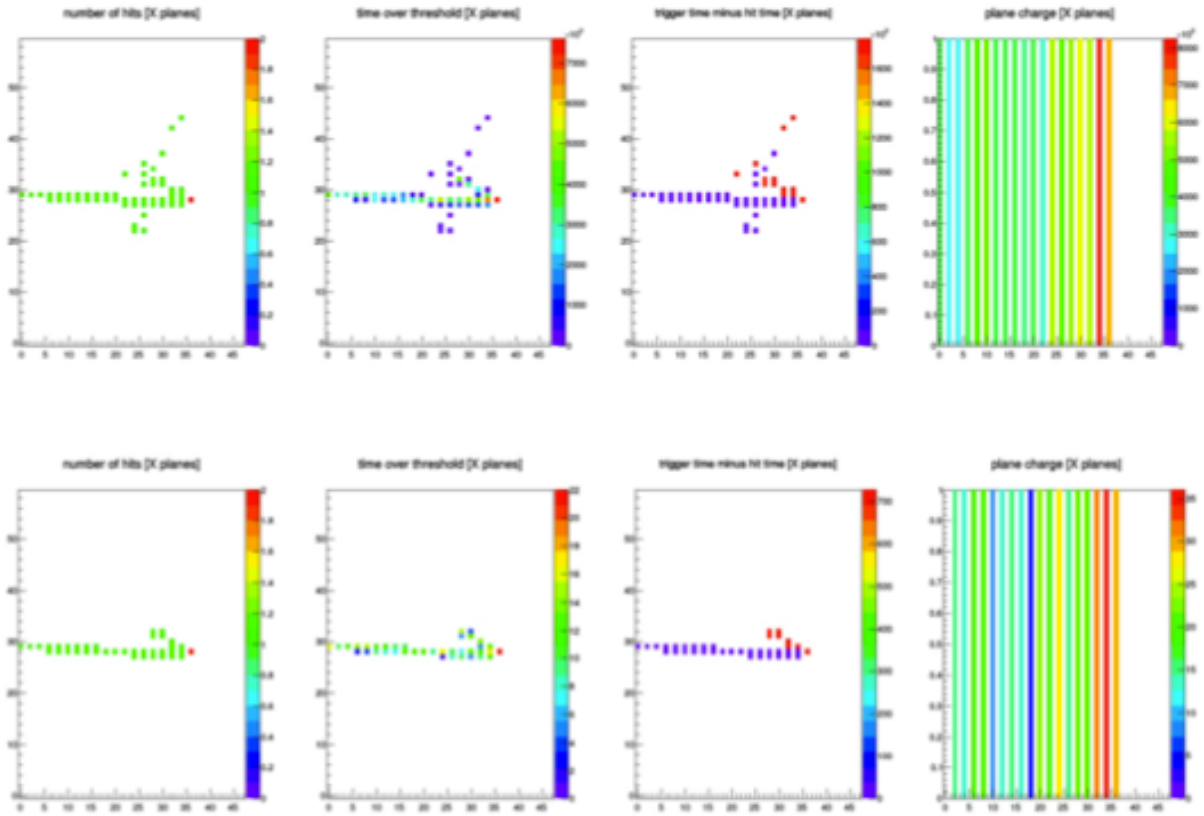
Upstream tracker



Downstream tracker

EMR (DRIELSMA)

- Digitization complete, pending review and integration with MAUS
- Track reconstruction progressing, anticipate integration before next CM



GLOBAL (GREIS/PIDCOTT)

Tracking (Greis)

- Jan Greis at Warwick has taken over from Peter Lane
- Getting up to speed
- Code refactoring, and transfer map based track matching in progress
- To be followed by fitting, Kalman filtering

Particle Identification (Pidcott)

- PID framework updated to handle tracker (momentum) and TOF (time)
- Expanding framework to add KL, Ckov, EMR
- Will need to integrate with global track when they come along

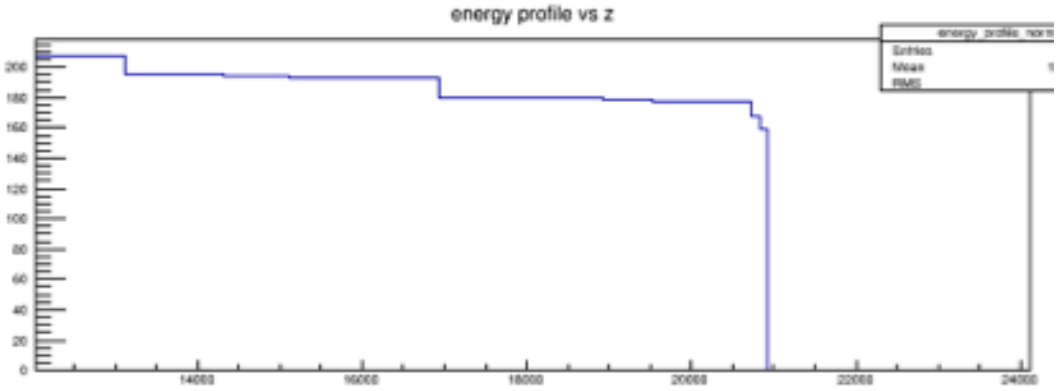
- Globals group now headed by Adam Dobbs holds bi-weekly meetings

MC Beam (Nugent)

- G4BL now shipped with MAUS to generate beam input
- Generates beam up to GVA1
- Decks validated against Step I data
- Initial beam library now available
  - MC production can start with what's available, but should optimize beamline and decide on a nominal set of beam templates

GEOMETRY (BAYES/RICCIARDI)

- Detector descriptions now in CDB
  - Pending Ckov confirmation
  - *Need nests→detector translation from detector groups*
- Absorber, diffuser irises added
  - Not yet in CDB
- Detailed validations in progress (material, energy loss, transmission…)
- Speed improvement attempts underway
  - Using GDML parser in MAUS
  - Decision point in mid-July to decide whether this is feasible, or find alternate implementation

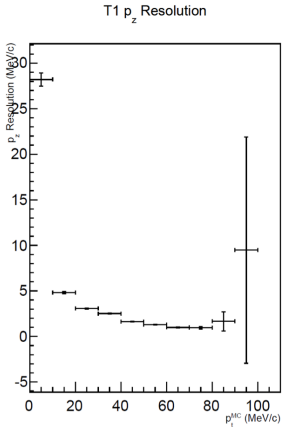


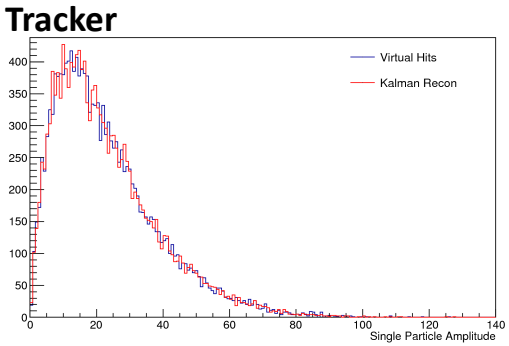
SUMMARY

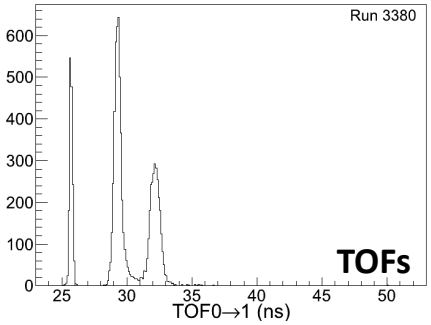
- Detector reconstruction
  - Have: TOF, Tracker, KL, Ckov, EMR (hit)
  - Don't have: EMR track reconstruction (coming soon)
- Global
  - Don't have: Global Tracking
  - Have: Global PID framework
- MC
  - Have: digitizers for TOF, KL, SciFi
  - Don't have: digitizers for Ckov, EMR (pending tests)
- Geometry
  - Need to resolve soon whether the speed-up implementation will work so we can move ahead
- Plans
  - Resolve memory issues and go ahead with batch reconstruction
  - Decide on beams, plans for batch MC production
- Need to start using the software for analyses (and complaining about missing features, bugs, etc…we'd like to find out sooner than later)

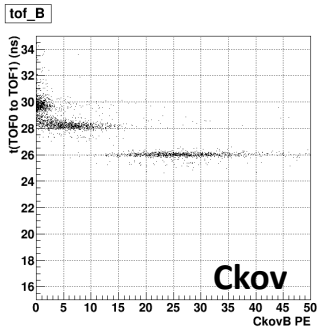
Step IV

Upstream









Downstream