Report on Reconstruction Meeting

Wednesday December 9th 1998

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ATLAS Reconstruction meeting, 9 December 1998

- Introduction
- Reconstruction software for Physics TDR
  - combined reconstruction
  - mu-id with GEANE
  - mu-id with iPatRec (was not on the agenda)
- Reconstruction code under development
  - Inner Detector
    - iPatRec, xKalman++
    - clustering
    - space points
    - Track classes
  - Lar calorimetry
  - Muon Spectrometer
  - Track fitting in magnetic field
- AOB

Software for Physics TDR

- Software for Physics TDR (David Rousseau)
  - combined reconstruction
  - e/gamma identification
  - conversions
  - combined ntuple
- mu-id
  - GEANE (Wim Lavrijsen)
    - some problems
  - iPatRec (Alan Poppleton)

for most of the things to be added to the combined ntuple code exists
for b-physics Dario Barberis estimates 1 month needed for production

DEAD LINE : mid January

Track Fitting in Magnetic field
(Kors Bos & Patrick Hendriks)

- Requirements
- Design Report
  - version 0.1 on the web
  - no major changes
  - 2 OIG's with annotation
  - is still too much in flux to be reviewed

Track Fitting in Magnetic field

- Classes :
  - TrackingInMagneticField
    - does the actual work, the stepping through the fiels
  - MagneticField
    - abstract base class
    - Implementations : ConstantMagneticField, MagneticFieldMap
  - Interceptor
    - interface class
    - VolumeInterceptor, SurfaceInterceptor
  - LocalTrackParameters
    - {position- & momemtum- vector and Q}

Track Fitting in Magnetic field

- Still to be done :
  - Load fieldmap from Objy
  - implementation for stepsize
  - re-engineer latest code again
  - finalise design document
  - relation with Track (eg. Track in ID)
  - check into cvs
- Discussion
  - release
  - irregular grid
  - accuracy in the regions of wildly varying field region

Muon spectrometer reconstruction

- new Muon reconstruction code (Patrick Hendriks)
  - in Arve in April 99

- Muonbox (++) ?
  - amdb++, Hit++ (not discussed at the meeting)
    - in Arve in April 99
  - magnetic field
    - in Arve in April 99

ID pattern recognition & reconstruction

- iPatRec (Alan Poppleton)
  - still evolving, more C++, less Fortran
  - effort towards combined reconstruction
  - Arve
- xKalMan++ (Igor Gavrilenko)
  - non-uniform magnetic field capability implemented
  - 1.2 time xKalman for uniform magnetic field
  - 1.5 for solenoidal magnetic field
  - tested with single muons and Jets (uniform magn. Field)
  - Plans :
    - interface to the modular TRT barrel geometry
    - Arve
    - consolidation with other reconstruction programs (common cluster, track classes, …)

SiCluster class
(Lee Drage)

- The SiCluster Class
  - a SiCluster is a collection of contiguous SiDigits
  - *methods
  - *error strategy (flat, precise, error)
- Building SiClusters
  - build and add vector of SiClusters to SiDetector
  - ClusterStrategy : how clusters are formed from digits
- Collecting Clusters
- Testing
  - comparison with iPatRec
- Discussion
  - will we keep digits & clusters (pointers ?)

Track classes
(Alan Poppleton)

- Track is a family of classes

  package in component model
- Different types of Track = polymorphism
  - express track quality such as :
    - primary
    - secondary
    - truncated

    by **aggregation**
  - additional features such as :
    - combined tracks
    - additional information from calorimeters
    - special treatment (brem recovery**)**

    by **inheritance**

Track classes

- TrackCandidate belongs to TrackFinder

  Communication via :

  - list<HitOnTrack> :
    - Event Identifier
    - Detector Description
  - TrackParameters :
    - Perigee
    - Surface

Lar Calorimetry
(Srini Rajagopalan)

- Triggered by milestone (1st OO reconstruction end ‘99)
- User Requirement Document
  - being drafted
  - public availability sometime around next Lar week
- design issues being addressed starting with Lassi’s prototype
- need people
- discussion
  - calorec++ ??

Milestones

- Muon new reconstruction code
  - 1st January :
    - working reconstruction
    - start integration : magnetic field,
      detector description, event domain (NT ?)
  - 1st February
    - integration completed
    - alpha-release, start of full testing
  - 1st April
    - beta release
- Muonbox (++) ?
  - 1st April
    - amdb++, Hit++, magnetic field in Arve
  - conversion of muonbox is being considered

Milestones

- Inner Detector
  - xKalMan ++
    - ‘minimum’ documentation required
    - added to repository
    - June ‘99 implementation in Arve
    - new clustering, track classes, etc ... will be considered (consolidation)
  - iPatRec
    - priority is Physics Combined Performance TDR
    - new clustering will be considered after TDR
    - June ‘99 implementation in Arve
    - for “mu-id” needs “muonbox” (++)

Conclusions

- OO reconstruction end ‘99 ?
  - Inner Detector
    - clustering
    - xKalMan ++
    - iPatRec
  - Calorimetry
    - ?
    - better view at the next Software week
  - muon
    - new code
    - muonbox ++ (?)