Status of Software for Physics TDR

Atlas Software Week

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Outline

- Simulation & Reconstruction for the Physics TDR
  - geometry
  - reconstruction
  - combined reconstruction
  - status of the code
- Production
- Summary

Status of geometry description

- Inner Detector & Calorimeters
  - ~ stable since February 1998
    - digitization routine for the COIL
    - bug fix to crack scintillator position
  - new digitization for the TILE calorimeter implemented

- Muon
  - M 2.8 database in October
    - new matter
    - new digitization

- All productions based on ‘cmz’ version

Reconstruction (1)

- Calorimeters
  - clunpk few modifications
  - Ecal Em- cluster reconstruction
    - em-shower identification, combined matrices
  - Hcal Jet reconstruction
    - modifications in JetFinder
  - Emis Missing energy

Reconstruction (2)

- Inner Detector
  - iPatRec Inner detector Pattern Recognition & Reconstruction
    - lot of work for combined reconstruction
  - PixlRec Reconstruction starting with pixels
  - xKalMan Kalman filtering
    - minor modifications

Reconstruction (3)

- Muon Spectrometer
  - Muonbox Reconstruction in the Muon Spectrometer
    - E-loss in muon spectrometer taken into account in fits
    - back tracking through calorimeters (with E-loss)
    - correction of E-loss with energy of calorimeter cells
    - Error matrix provided at the entrance of the Inner Detector

Combined Reconstruction (1)

- e/γ reconstruction
  - calorimetry + tracker
  - cluster + tracks ---> electrons, photons
  - final PID
  - best E and position
  - produce banks
    - PHOT
    - ELEC
- conversions
  - xconver
  - xhourec

Combined Reconstruction (2)

- Muon “identification”

  Track (Muon spect.) + Track (Inner Det). ---> muons

  muonbox iPatRec

  MuonboxInterface

  MuonIdentification

  - tables describe the inactive material
  - re-fit at beam-line to muon-hits + E-loss
  - match to tracks in corresponding InDet road
  - combined fit to all matched combinations

  – good at high Pt
  – had poor efficiency at low Pt (should be improved now)

Combined Reconstruction (3)

- Muon “identification”

  new ‘statistical’ approach combining covariance matrices
  – muonbox
  – xkalman

  work going on
  improved efficiency at low Pt

Combined Reconstruction (4)

- Other work(private basis)
  - e/gamma identification
  - conversions
  - soft electron identification
  - muon identification
  - soft muons
  - tilecal cells
  - primary vertex
  - vertex b-tag
  - overall b-tagging (when soft e/mu available)
  - mu-id with COBRA (geane)

Combined Reconstruction (5)

- Combined Ntuple is provided in Atrecon (cbnt)
  - Ntuple is filled from output Zebra banks of atrecon (RECB chain)
  - possibility to fill in from DST (if any)

Status of the code

- All code now in srt/cvs
  - dice not fully tested
  - not yet an ‘official’ release

- Applications
  - DiceMain
  - DicePytMain
  - AtreconMain
- not all platforms

Production

- Simulation
  - refer to Production Web page :
  - http://www.cern.ch/Atlas/GROUPS/SOFTWARE/HELP/productions.html

- Reconstruction
  - mostly done on private basis
  - non exhaustive list
  - http://nicewww.cern.ch/~poulard/workshop/march_99/prod_1.html
  - http://nicewww.cern.ch/~poulard/workshop/march_99/prod_2.html
  - http://nicewww.cern.ch/~poulard/workshop/march_99/prod_3.html

Summary

- Code for the Physics TDR is there
  - major reconstruction programs have evolved
  - combined reconstruction is still being improved
- High effort to meet the dead-line

Next

- Evolution of the geometry
  - Is-it needed ?
  - Time scale
  - reference version for Geant4 ?
- Evolution of the Reconstruction
- Do we want a comparison in 200?
- Analysis in new framework of produced data ?
- Effort to maintain a running software !