TRAIL in Brunel

Matt Needham

- Participants in the Brunel team
- Timescales for Migration
  - Simulation
  - Digitization and Geometry Description
  - Pattern Recognition and fit
- Boundaries and Responsibilities

(Based on replies I gave to Marco's questions)

Participants in the Brunel Team

- From the outer tracker: Matt Needham
- From the inner tracker: Frederic Ronga

Large overlap in terms of geometry definition / pattern recognition between inner and outer tracker

Timescales:

Timescales set primarily by:

- Inner tracker technology choice (Autumn)
- Inner and outer tracker TDRs (early next year)

But also to get future benefit by re-implementing things in C++ now !

Simulation

Currently very naive:

- Each station simple box No layer structure
- Store entrance and exit point per station
- Get intermediate points by simple circle fit
  - Bad $\Rightarrow$ need particle momentum
  - Only have this information at production vertex
  - Have to assume no energy loss

Re-implement in SICBMC to solve these problems and allow inner tracker to make studies for technology choice:

- Layer structure
- Entrance and exit point per layer
- More realistic treatment of inactive areas, frames, ...
- New CDF files

- Hope to complete by end of July
- Begin move to Geant 4 after TDRs

Digitization and Geometry

New simulation = new digitization procedure

- Makes sense to do this in C++
- Re-use code when move to Geant 4
- For inner tracker will also have clustering algorithm
- Work in progress. Hope to finish by $\sim$ end of August

- Also need access to geometry for digitization.
- Short-term manpower limited.
- Access geometry directly from CDF files/FORTRAN (as now)
- $\Rightarrow$ No immediate plans to start on the XML data description

At this point SICBDST will break

Pattern Recognition and Final Fit

Final Exists almost entirely C++. Plan (next $\sim$ month)

- Finish things off (provide same functionality as SICB):
  - Velo Hits in fit $\Rightarrow$ in progress
  - Electron transport
  - Compile on NT $\Rightarrow$ in progress
  - Repackaging ?
- Public Release
- Parallel running of FORTRAN/C++ fits in Brunel
- Retire FORTRAN fit
- If necessary output of fit converted back to ZEBRA
- Next follows naturally that have a first public release of pattern recognition
- Could also be fed back to FORTRAN $\Rightarrow$ What do about ghosts/references etc

Boundaries and Responsibilities

Definitely need:

Velo information:

- Clusters for use in the kalman filter
- Track candidates for external seeding (building these is not our task)

Particle ID information:

- RICH/Calorimeter info to identify electrons for final fit
- Calorimeter info to try and associate radiated photons to electrons

Maybe:

- Muon/Calorimeter info for external seeding