MEG Offline status and plans

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Existing software

The existing software for event generation and simulation comes from the merging of codes developed in

- megsim (Pisa)
- japsim (Japan)

The resulting code is under

- gem

The code makes use of

- F77
- GEANT3
- CERNLIB
- HBOOK

The status of the code is

- The GEANT3 simulation of the material distribution is quite detailed
- The simulation of digitization is implemented in some detail only for the argon calorimeter
- It is only at the zero-th order for the other subdetectors
- There is no simulation of trigger and electronics
- GEANT3 graphics is available
- It produces no output

Data format

A key missing requirement of gem is the lack of structured output.
We need a format to transfer data from event generation to simulation and from there to reconstruction as well as from data to reconstruction.
In a Fortran 77 environment the obvious choice is

- ZEBRA

The main problem being the matching between the data from the online DAQ MIDAS in midas format and ZEBRA.

Software distribution

The software is organized in CVS, with the CVS repository in PSI at midas.psi.ch.
The CVS masters will be the three coordinators and single modules (subpackage) will be handled by subcoordinators.
Access in read mode is guaranteed to every member of the collaboration through the common account meg and the usual password.
For accessing in write mode a personal password account must be asked to Stefan Ritt and write permission to CVS must be obtained by the CVS manager Paolo Cattaneo.

Status of the simulation

The status of the merging is the following

- Event generator merging is complete (from Pisa code)
- DCH simulation merging is complete (from Pisa + Tokio code)
- TIC simulation merging is complete (from Pisa code)
- Magnet simulation merging is complete (from Tokio code)
- B field simulation merging is complete (from Tokio code)

Progress beyond merging

- Event generator is being separated in a stand alone package
- Improvement of TIC geometry and new options
- Detailed description of the DCH geometry and material

TODO list

The TODO list is

- Implements the ZEBRA structure at all level
- Merge the code of the Liquid Xenon Calorimeter
- Improvements on the hit formation of all subdetectors (perticularly DCH and TIC)
- Implement the digitazion stage of all subdetectors
- Write a full reconstruction and analysis program, integrating the existing algorithms for the argon calorimeter.

Data Base

Do we need a offline data base ?
Geometry and calibration data must be stored and retrieved by the reconstruction program.
Either these data are available in the online data, or in the online database ODB (somehow) or in a separate database (like MySQL or HEPDB).
The interaction with the ODB must be understood.

Priorities

The most pressing priority is the setting up the ZEBRA structure.
Each sector of the program:

- Event Generator
- Event Simulation
- Event Recostruction

must have the capability of fetching the data from the previous stage, storing the processed data in ZEBRA banks and writing the information to disk.
Each subdetector must define the ZEBRA bank structures for the geometry, the simulated event, the raw data, the hits and the recostructed objects keeping cross reference between reconstructed objects and true Monte Carlo event.
Before developing algorithm for simulation and reconstruction the banks structure must be defined in order to allow the development for each stage of different algorithms dealing with the same input-output formats.
Bank design should be done using the DZEDIT tools that generate code from a bank description suitable also for documentation.