Status of Zero Degree Calorimeter

Michael Murray, Jan 24th 2000

The ZDCs are the primary detectors to setup and tune collisions. They must be operated (and analysed) as closely as possible for all experiments. Last summer the ZDCs were able to detect neutrons and to give feed-back to RHIC. We even saw "coincidences" produced by beam scraping far upstream from BRAHMS and hitting one ZDC backwards and the other forwards. The time difference between the calorimeters implied $v \approx c$. The ZDCs suffered a radiation dose of 7rad which is negligible compared to their measured hardness of 100Krad. We implimented RHIC software for setting HV and tracking scaler rates. The Monte Carlo was integrated into GBRAHMS, thanks [FV]

What needs to be done?

- RHIC clock must be made to work MM/FV
- Configure electronics as agreed with RHIC. MM
- Improve Cabeling MM
  - Take TDC-delay cables off wooden spools.
  - Redo LIMO cables in FE HUT.
  - Improve cable run in IR.
- Random triggers would be very useful.
- Write Operating Procedures for shift crew. MM
- Monitoring AM is adapting code to Kris's format.

- **Calibration Software** MM
  - **Pedestals**, derived from "random" triggers
  - **Energy Scale** will be based on CERN proton and muon tests as well as cosmic ray calibrations. This will be done in collaboration with other experiments.
  - **Time Scale** from "picket fence" pulser runs
  - **Time offset** can be deduced from "backward/forward" coincidences mentioned above. We need to record some of these "bad" coincidences which will require two coincidence gates.
- **Offline Code** MM
  - **Z of Vertex** from $T_{left} - T_{right}$
  - **Luminosity**
  - $E_{forward}$ **vs Central Multiplicity**
- **Monte Carlo** MM with other experiments.
  - **Time information** must be added to hit structure
  - **DX magnet and beam-pipe**, improve description
  - **Clusters** should be produced by coalescence and tracked. They may produce extra background.

I will prepare ZDCs by the end of February and concentrate on software after that.