On PHOS raw data

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ALICE off-line week

Question from the core off-line team (1)

1. Detailed schedule of the detector commissioning - test-beam, cosmic, calibration data taking.

    - 1st PHOS modules was assembled in CERN in April-May 2006
    - DAQ was tested and tuned in June-July 2006
    - Beam test in June-August 2006 was a part of the PHOS commissioning
    - Aims of the beam test:
        - ✓ Calibrate all the channels with 2-GeV electron beam
        - ✓ Install and test FEE, DAQ, DCS, HV system, cooling system, LED monitor system
    - September-October: fixing the HV and FEE problems found during the beam test
    - Since there is no DAQ in P2, the later PHOS goes down to P2, the more data can be taken from it by cosmic rays and LED monitor system

- List of the persons who are responsible for the DAQ and analysis of the data.
    - DAQ: H.Muller, Yin Z., P.T.Hille, …
    - Data analysis: B.Polichtchouk, M.Bogolyubsky, Yu.Kharlov, …

Question from the core off-line team (4-6)

2. DDL/EquipmentID mapping
   - Done
3. Geometrical mapping (inside a DDL)
   - Done
4. Status of raw-data reconstruction.
   - Done
   - Now raw data are sampled in time (128 samples per amplitude). In aliroot a simple method of the signal amplitude extraction is applied. Needs more sophisticated method of sample fitting, 3 algorithms are available for it but 2 are not implemented in aliroot yet.
   - Later (>2008?) sample fit will be performed in HLT, and raw data stream will contain only amplitude and time. Then raw data reader should be changed.
5. Removal of all the dependencies on gAlice in raw data reconstruction
   - Done

Question from the core off-line team (7-8)

6. Status of raw-data simulation

- Now raw-data simulation is not consistent raw-data reconstruction. The same mapping will be applied (October 2006).

7. Raw-data visualization

- Not studied yet. To be done in October-November.

8. Raw2SDigits method needed for event embedding (raw+simulation)

- Not ready yet. Have to be done by the end of 2006.

More raw data issues

- Source of pedestals
  - Extracting pedestals from raw data would provide the best precision, but we cannot afford storing all the data without zero suppression (5 modules * 3584 channels * 2 gains * 128 samples * 2 bytes = 9 Mbytes/event).
  - Pedestals seem to have to be measured in a special pedestal run and fed back to FEE for subtraction or threshold. How?
- Data compression
  - Sampled data is 100-200 times larger than the physical signal (amplitude and time)
  - Loosless compression (e.g., LZ) can reduce data size only by a factor of 3
  - Loosy compression is inevitable, however at a cost of data quality
  - From two gains, only the best precision one can be stored
  - First pp run with 1-2 PHOS module, low luminosity, and pedestal subtraction would produce not too much data even with sampled signals (2 clusters * 25 cells * 128 samples * 2 bytes = 12 kbytes/event); all sampled data can be stored.
  - Data fitting procedures are being developed by HLT, will be tested on real data. Quality criteria: amplitude and time resolution
  - Next LHC runs (high-luminosity pp and Pb-Pb) will store data with loosy compression only.