

# BRAHMS Computing

- BRAT Status
- Summary of December software meeting
- BRAHMS Online Monitoring
- Work to do

# BRAT Status

- BrRawDataInput added in summer
  - Unpack mapped data from event builder and build digitized objects
  - worked reasonably well in test run for detectors implemented at the time
    - **ZDC, BB, MultTiles, H1?**
  - Unpacking for TPC implemented since (FV)
- Work in last months on TPC code to process “real” tracking data. (FV)
  - Presentation Monday showed both that TPC is fundamentally sound as well and that we have software to process the data

# BRAT Directions

- Need to go from a prototype to a functioning system
  - have begun the path
  - beam would help, but what can we do in the meantime
  - automation of many things
    - **need details from detectors**
  - database interfaces
    - **software meeting of 6-10 Dec**

# Software Meeting

## BNL (6-10 Dec-1999)

- BRAHMS Databases (main emphasis)
- Online Monitoring
- HV
  - Changes to underlying framework of HV program (now written in C++)
- Raw Data Format
  - iteration of record id's of raw data
- Code organization
  - online code now moved to same repository as other BRAHMS software

# BRAHMS Databases

- concrete implementation
  - Objectivity
  - MySQL
  - Oracle
  - ROOT
  - Something else
- What goes into data base?
  - A lot of discussion during the December meeting. Working groups established to list what needs to go in on what frequency

# BRAHMS Databases

- Originally assumed to be Objectivity
- Investigation by C. Holm between Aug-Dec, 1999
- loss of interest due to complexity of implementation
- Proposal to use MySQL or ROOT files
- As week progressed, more leaning toward MySQL
- Anders and Christian making some concrete investigations into MySQL. (IAB presentation Tuesday)

# BRAHMS Databases

- Geometry DB
  - Beamline, detectors, magnets
  - local position (x, y) of pads relative to TPC origin for example
  - global position (x,y,z) of TPC on frame
- Field Maps
  - measured Bx, By, Bz on a grid of one-several current settings
  - update frequency: order of years
- Calibration
  - TPC gain and t0 for each channel, dead hot noisy channels
  - TOF
  - DC
  - Update frequency: order of hours or days
- Slow control
  - Rapidly changing data
  - TPC gas (temperature, pressure drift velocity)
  - other detectors? (need input from all detector subsystems)
  - update frequency: seconds, minutes
- Slowly changing data
  - magnet currents, hall probes, HV
  - update frequency: 5 minutes
- Stable data
  - TPC pedestal: mean, RMS, and time bin for each channel
  - update frequency: days
- Run DB: discussed in more detail below

# BRAHMS Online

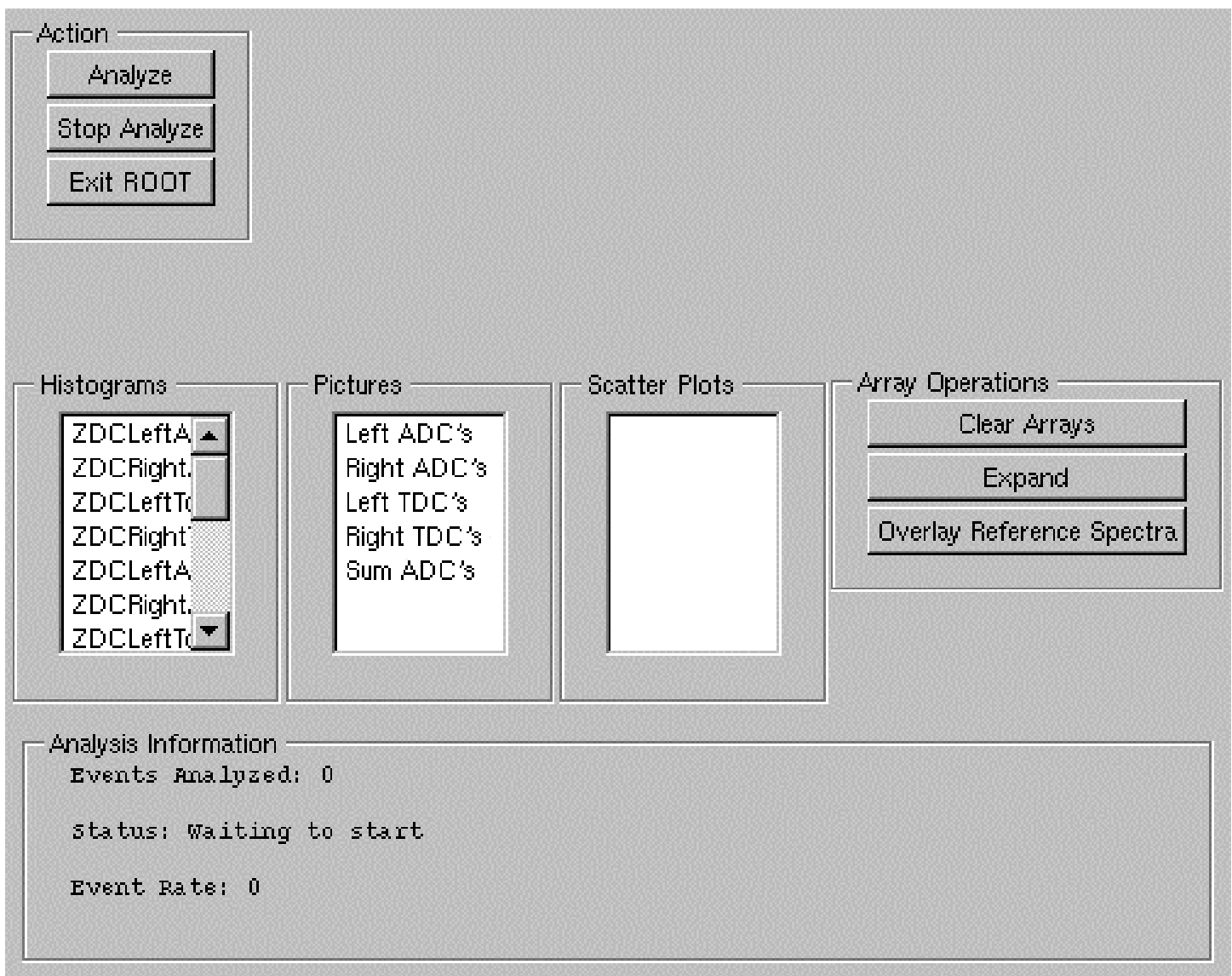
## Monitoring

- Initiated last summer when there was beam
- Individual detectors
  - BrBaseMonitor
    - semi-complex base class called which takes care of complicated graphics (and removes some eccentric ROOT personalities)
    - Different monitors can inherit from this base class.
    - Spectra
    - scatter plots
    - pictures (groups of spectra and/or scatter plots)
    - Methods to add monitoring spectra fairly simple
- Global Monitoring
  - BrSuperMonitor
    - Class to manage individual monitors
    - Add as many or as few as needed
    - Tabs to select detectors to display spectra



# BrMonitorXXX

inherits from BrBaseMonitor



# BrSuperMonitor

The screenshot displays the BrSuperMonitor software interface. At the top, there are two main panels: "Control" with buttons for "Analyze" and "Exit ROOT", and "Global Array Operations" with buttons for "Clear Arrays" and "Overlay Reference Spectra". Below these are four tabs: "Br Monitor ZDC", "Br Monitor BB", "Br Monitor C1", and "Br Monitor Mult". The "Br Monitor ZDC" tab is active, showing four sub-panels: "Histograms" with a list of ZDCLeft and ZDCRight entries, "Pictures" with a list of ADC and TDC data, "Scatter Plots" with an empty plot area, and "Array Operations" with buttons for "Clear Arrays", "Expand", and "Overlay Reference Spectra". At the bottom of the main window is the "Analysis Information" section, which displays "Events Analyzed: 0", "status: Waiting to start", and "Event Rate: 0".

This is a configuration dialog box for a plot. It contains the following fields and controls:

- x-min: 0.000000
- x-max: 4095.000
- y-min: -1111.00
- y-max: -1111.00
- Plot Modes:  Y-log,  X-log
- Frames to select: \*
- Buttons: OK (green), Defaults, Cancel

A red arrow points from the "Array Operations" panel in the main interface to the "OK" button in this dialog box.

# Directions in Online Monitoring

- Is this the right direction to go?
  - preliminary indications in summer where positive (decision in December meeting to proceed this way)
- What else is needed?
  - 2d scatter plots. To be implemented ASAP (implemented in last weeks)
  - remove ROOT eccentricities (continuous exercise)
  - more buttons
  - more status information
  - stability (anomalous hang-ups in summer; not resolved)
  - other items

# Detector Monitoring objects for experiment

- Contributions from detectors
- mail message from Flemming  
7-Dec-1999
  - One response to me; 2 to Flemming.
  - Need monitoring for TPC's, DC's, RICH, TOFW
  - Monitoring for Mult, C1, ZDC, BB only prototype (although usefull as experience last summer suggests)
- When can we expect contributions (or at least names of who will do it???)

# Summary/Work to do

- Raw data unpacking
  - DC
  - RICH
  - TOFW
  - Calibration Chambers
- Databases
  - Implement underlying database (probably MySQL) into prototype access methods (db managers) we already have.
  - Lots of details to work out on exactly what goes into databases at which frequency. (A lot of discussion in December meeting with some investigation)

# Work to do

- Raw data processing
  - A lot is done for TPC, DC
    - digitization from model routines
    - TPC routine can handle raw data at cosmic level
    - tracking
    - track matching
  - very little done for other detectors
    - digitization
    - some analysis from commissioning run
- Calibration routines.
  - Need detector groups to decide how this is done for their detectors
  - Some work done on TPC. Ie move calibration dependencies to methods in parameter objects (remove calibration from analysis routines)

# Work to do

- Automation
  - automatic calibration procedures
    - need from all detectors
  - scripts to feed data from HPSS into reconstruction machines
  - machinery to keep track of progress of reconstruction
    - what needs to be processed?
    - Status of what is being processed
    - what has been processed
    - pointers to output of what has been processed
- Online Monitoring
  - SuperMonitor “developed”
  - BaseMonitor simultaneous development
  - **NEED CODE FROM DETECTOR PEOPLE OR ELSE WE WILL RUN WITH WHATEVER PROTOTYPE I GENERATE!!!**

# Summary

- Database decisions still in flux
  - My opinion is that MySQL will gain (has gained???) momentum.
  - Lots of details to work out on exactly what goes into databases at which frequency. (A lot of discussion in December meeting with some investigation)
- Monitoring
  - SuperMonitor “developed”
  - BaseMonitor simultaneous development
  - **NEED CODE FROM DETECTOR PEOPLE OR ELSE WE WILL RUN WITH WHATEVER PROTOTYPE I GENERATE!!!**