

**BRAHMS collaboration,**  
RHIC & AGS Users' Meeting  
**August 7-8, 2000**  
**BNL**

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## COLLABORATION

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## Overview of presentation

- Global detectors and spectrometers description
- Detector commissioning
- Preliminary results from global detectors
- Plans for the immediate future

# Perspective View of Spectrometer

Title:

pers.ps (Portrait A 4)

Creator:

HIGZ Version 1.23/09

Preview:

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with a preview included in it.

Comment:

This EPS picture will print to a  
PostScript printer, but not to  
other types of printers.

## Global Detectors

- **Beam-Beam Detectors**

Array of fast PMTs connected to Cherenkov radiators. This detectors provides a start time and Level 0 trigger

- ~50psec time resolution and vertex determination to ~2 cm.
- Can also be used to measure multiplicity at high  $\eta$ .

- **Multiplicity Detector**

- For the runs we are reporting about, this detector is a set of 40 scintillator tiles. Sufficient segmentation to extract  $dN/d\eta$

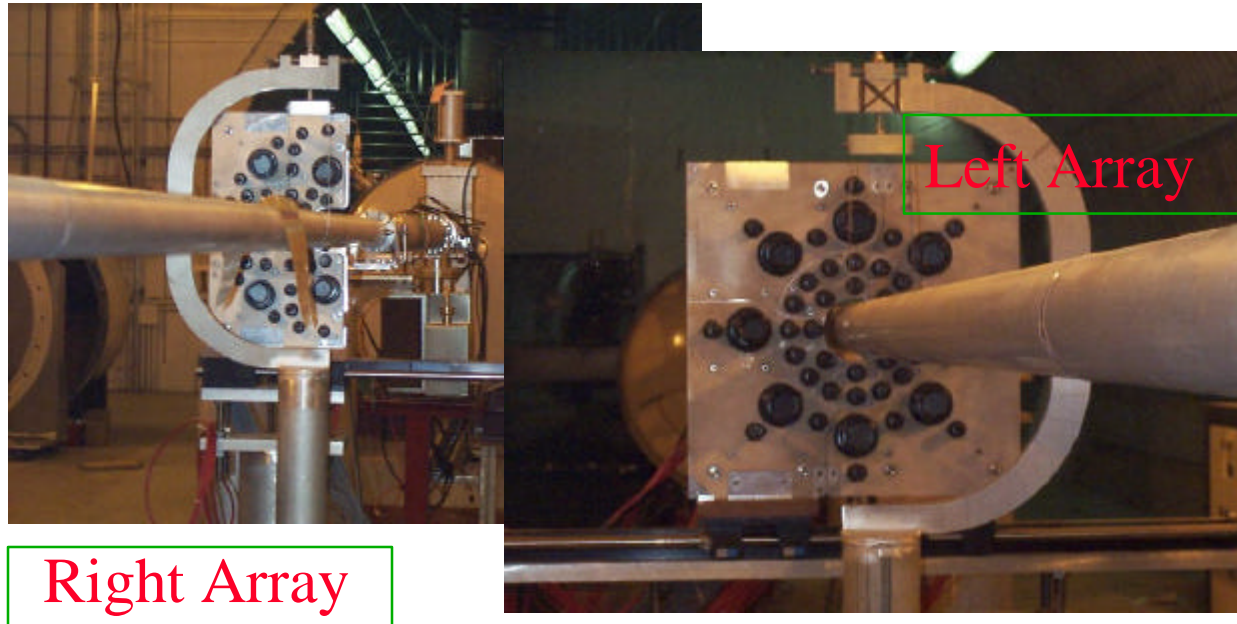
- It will also be used to trigger on central/ non central events in Au-Au and Si-Si reactions.

- **Zero Degree Calorimeters (ZDC)**

- Common instrumentation for all RHIC experiments. --

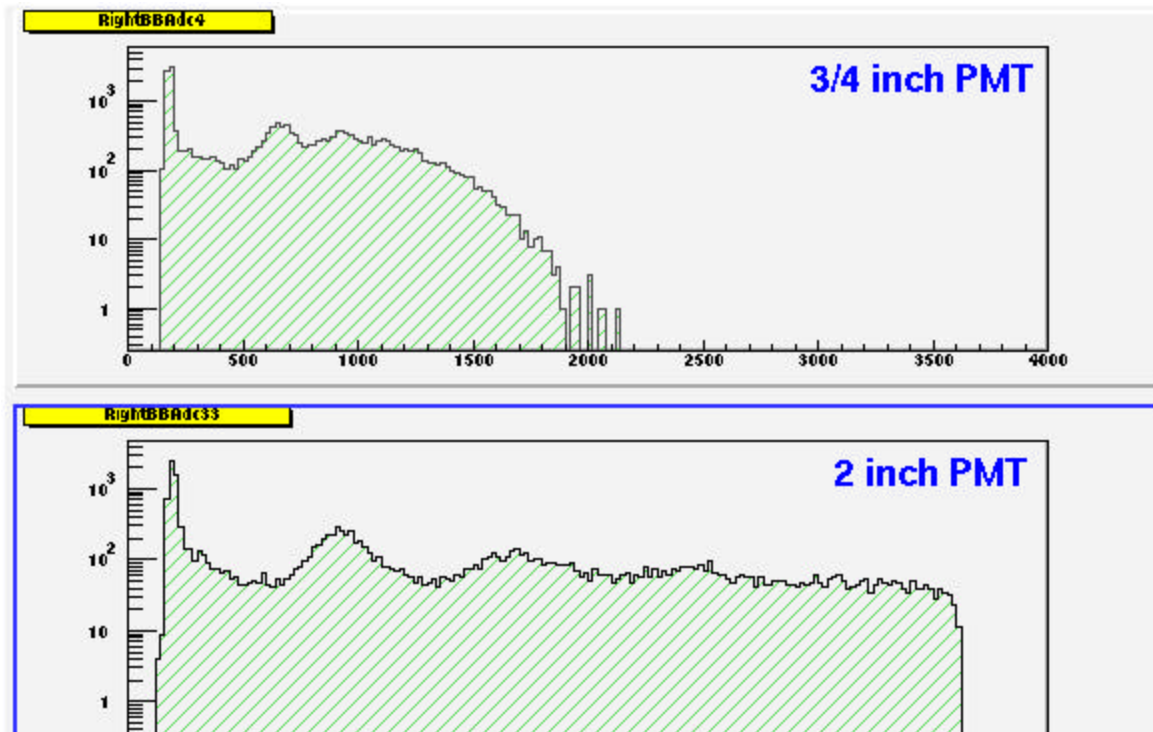
- Detects neutrons at 0 degrees.

# Beam Beam Counters

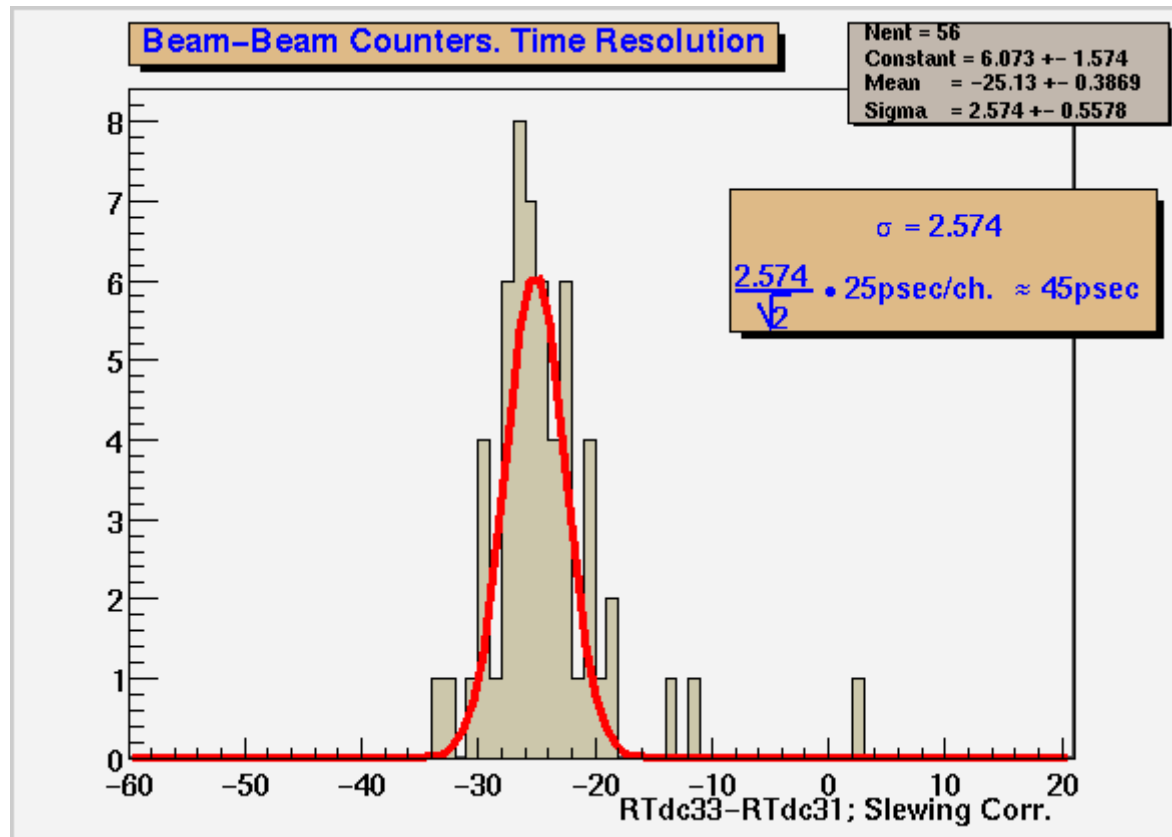


Right Array

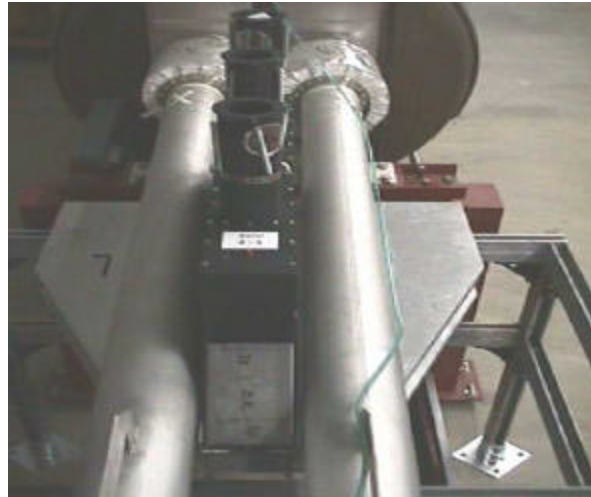
Left Array



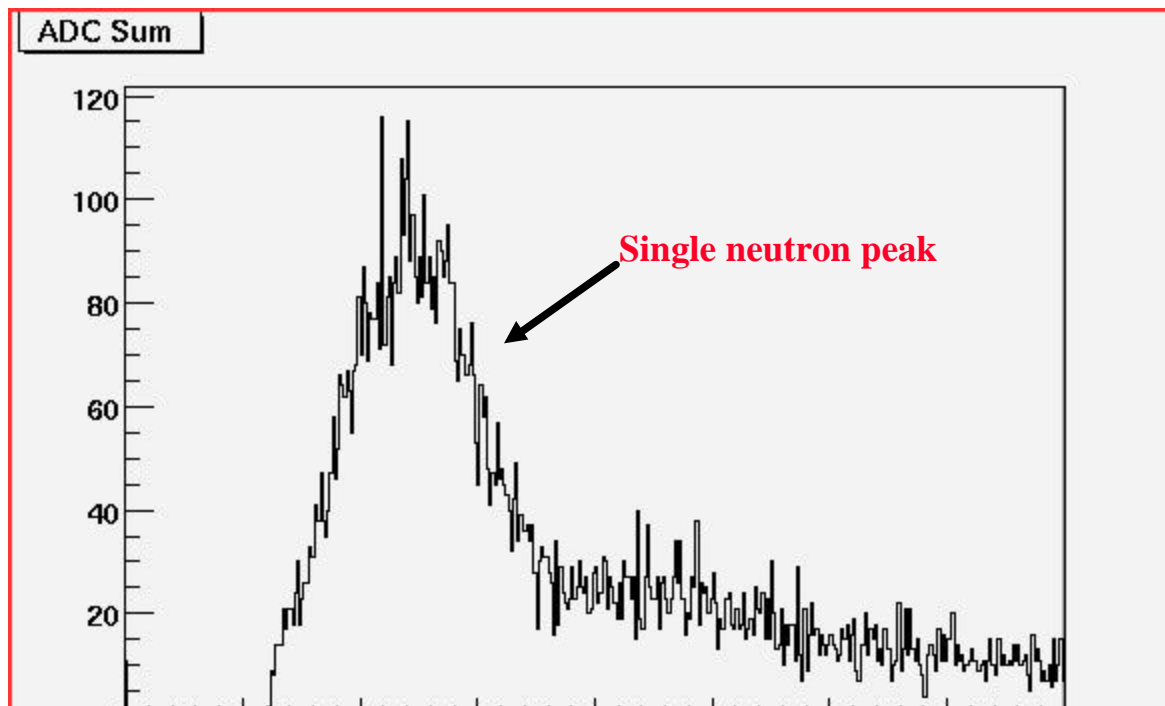
Time resolution of two 2" PMTs for events with a single charged particle.



## Zero Degree Calorimeter



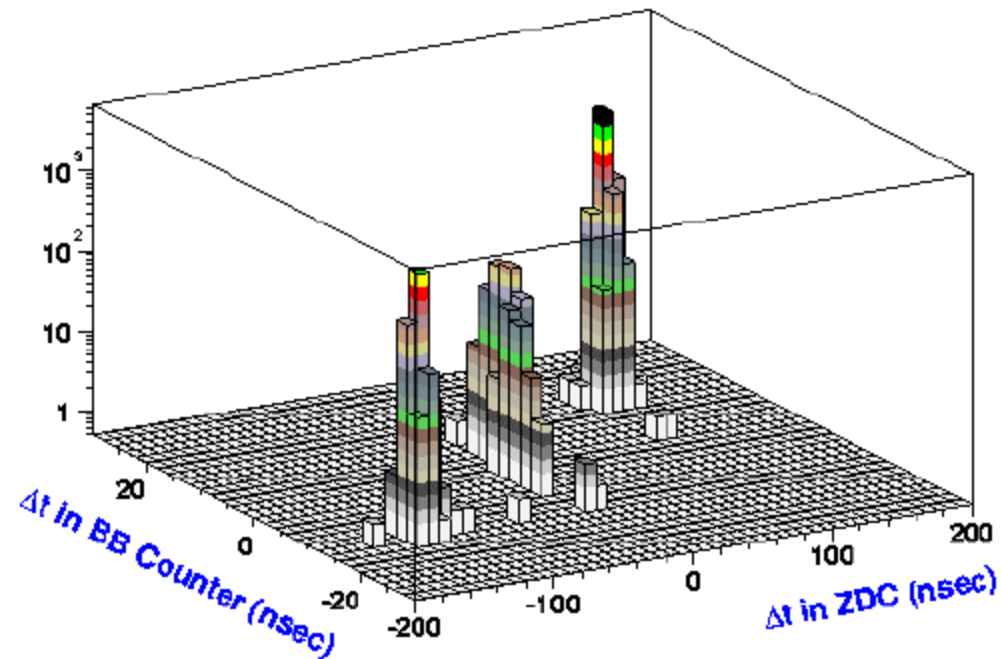
- Used as one of our least biased triggers.
- Has good resolution to count neutrons.

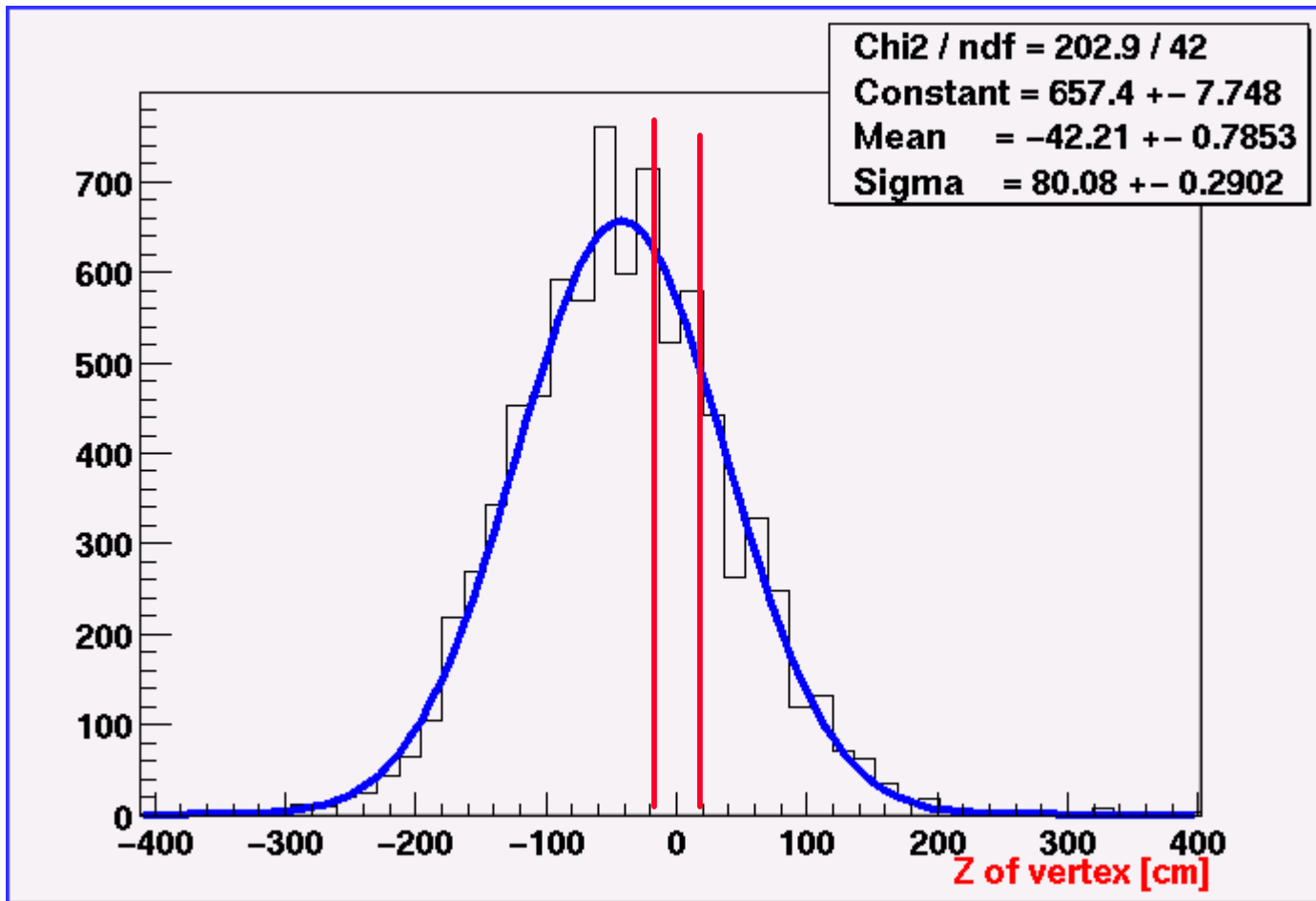




# First collisions seen in time differences in Beam-Beam and ZDC detectors.

The central peak is populated by collisions





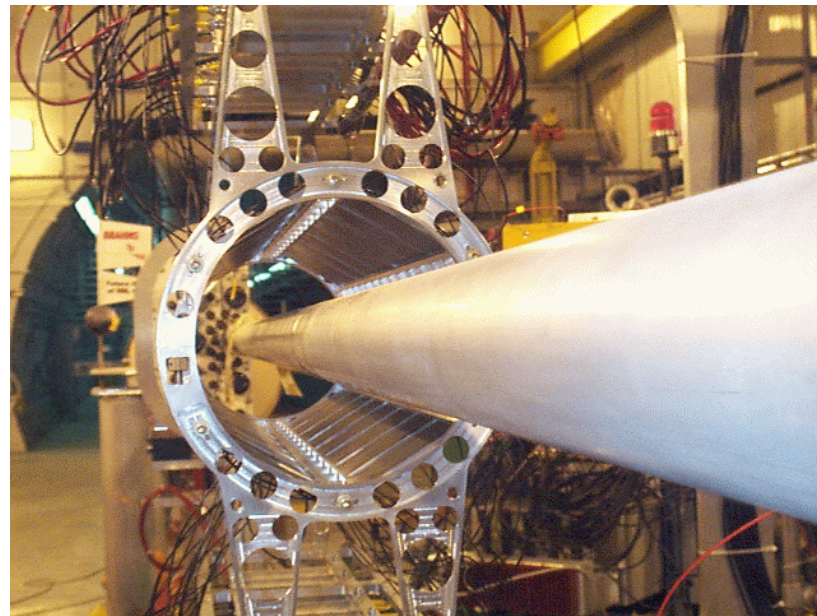
Z coordinate of vertex extracted from time difference between BLUE and YELLOW ZDCs.

The arrows indicate the fraction of the 'diamond' seen by the

## Multiplicity Detector

Hybrid Detector consisting of two layers of

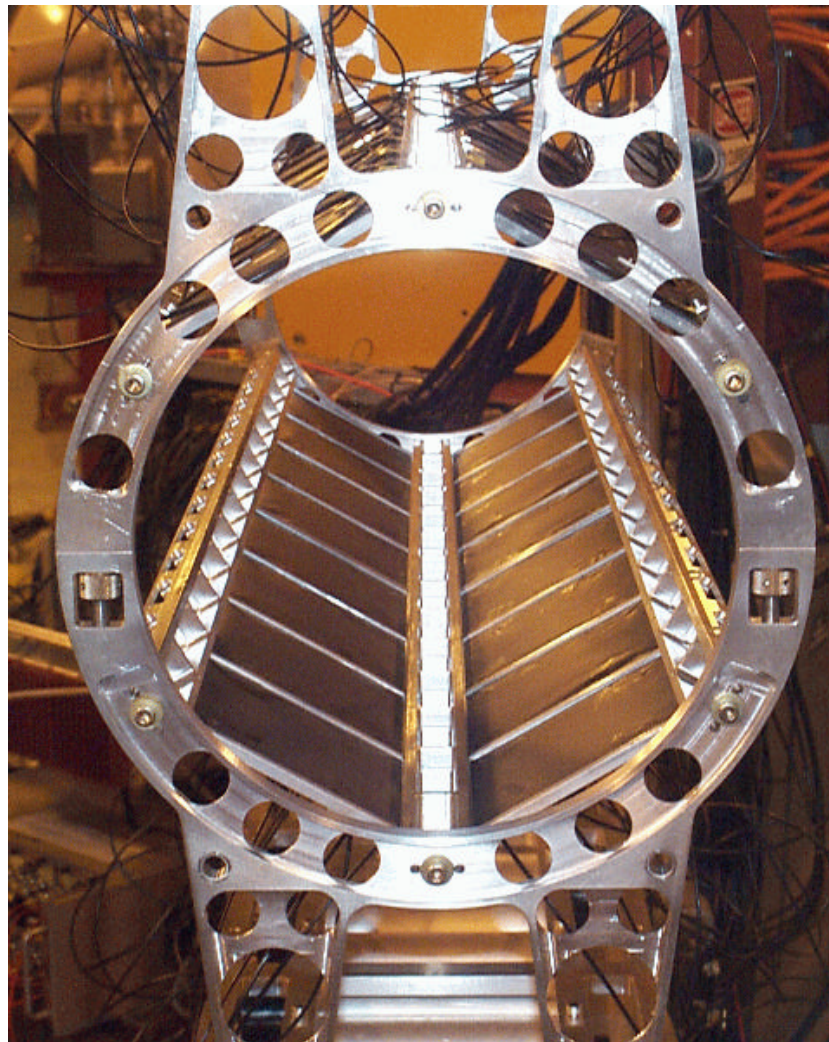
- 168 channels of Si-detector strips (only 14 installed during the period we report)
- 40 segments of 12\*12 cm scintillator tiles
- coverage  $-2.2 < \eta < 2.2$

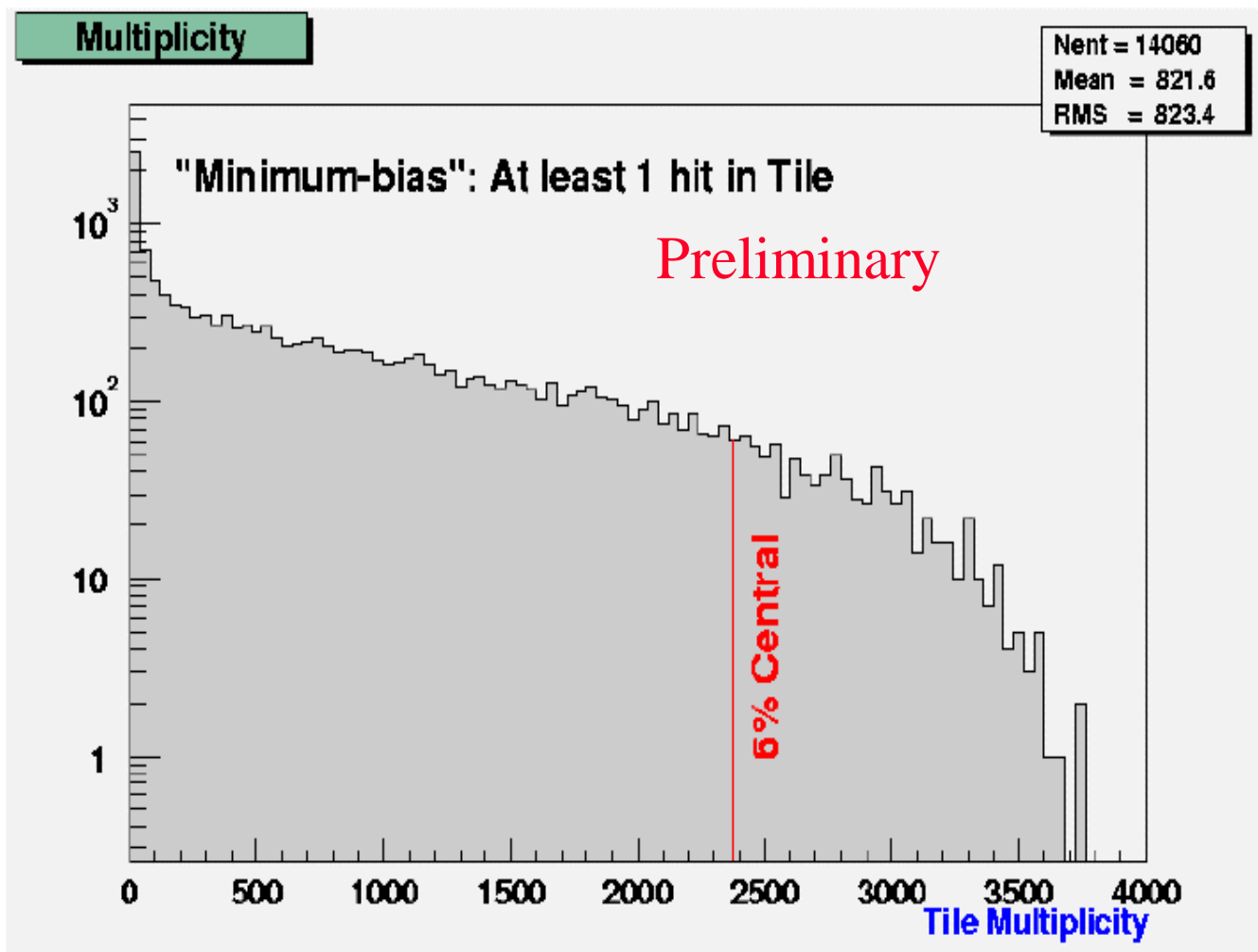


The tiles are made of BC408 and are read with two turns of WLS fiber placed in a groove machined along the edge of the tile.

(STAR EM Cal. readout Wayne State)

This light collection technique is position independent across the entire tile.



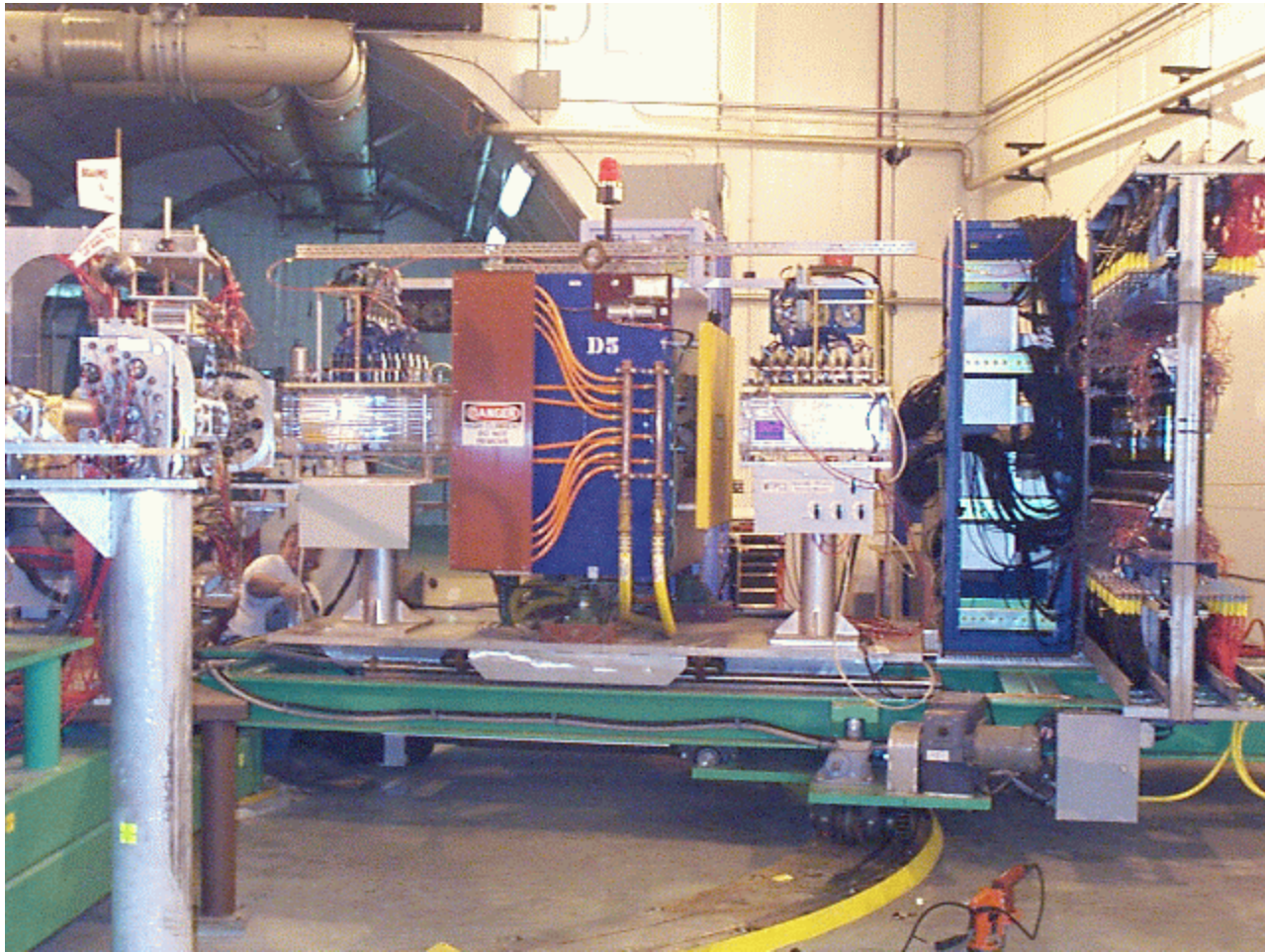


MIP equivalent multiplicity:

Pedestal subtracted, gain matched, ADC corrected for average angle of incidence. Tiles with more than 10% of the total sum are not included.

# Spectrometer System

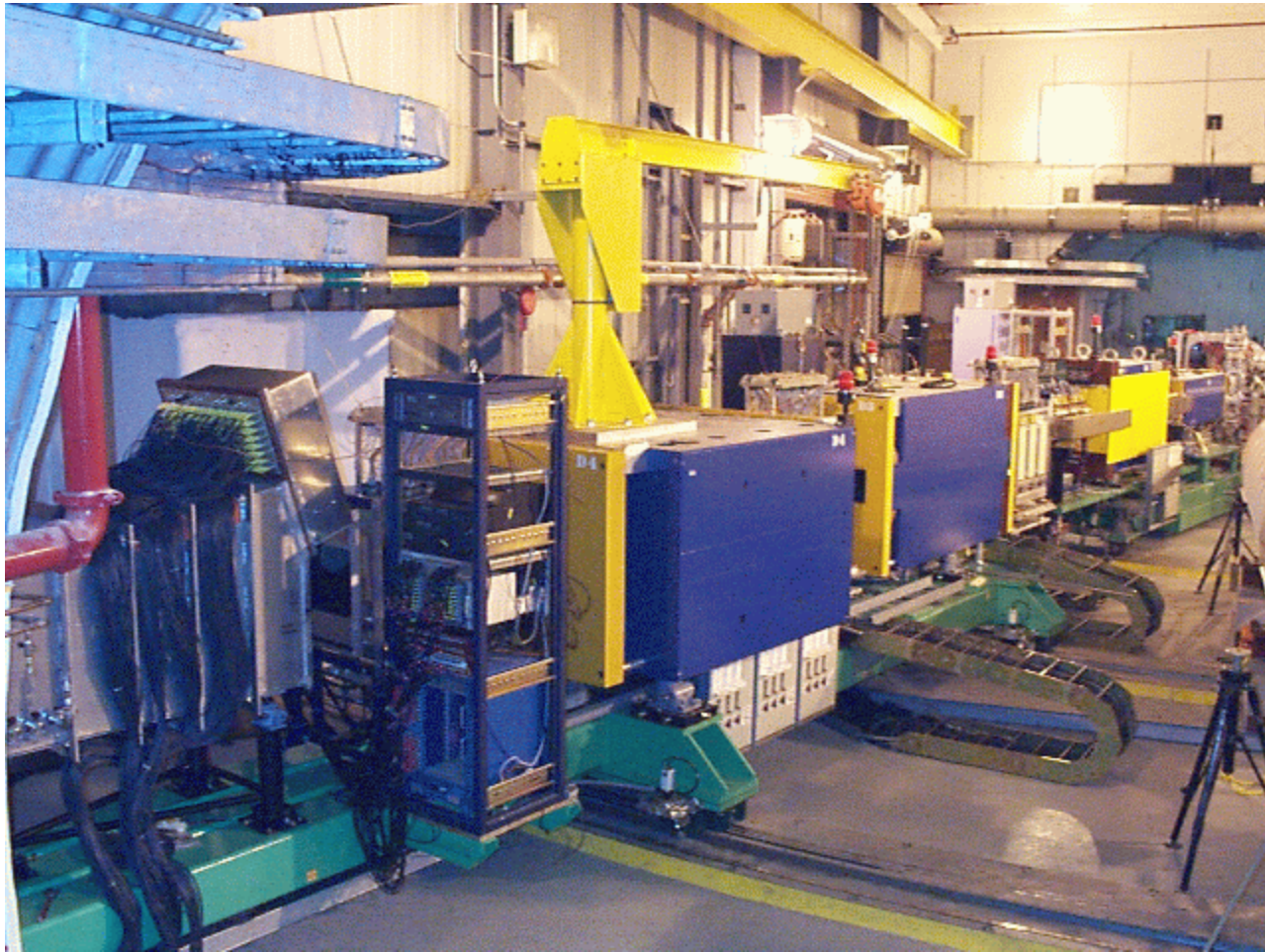
## Midrapidity Spectrometer



TPM1 D5 magnet TPM2 TOFW

## Spectrometer System

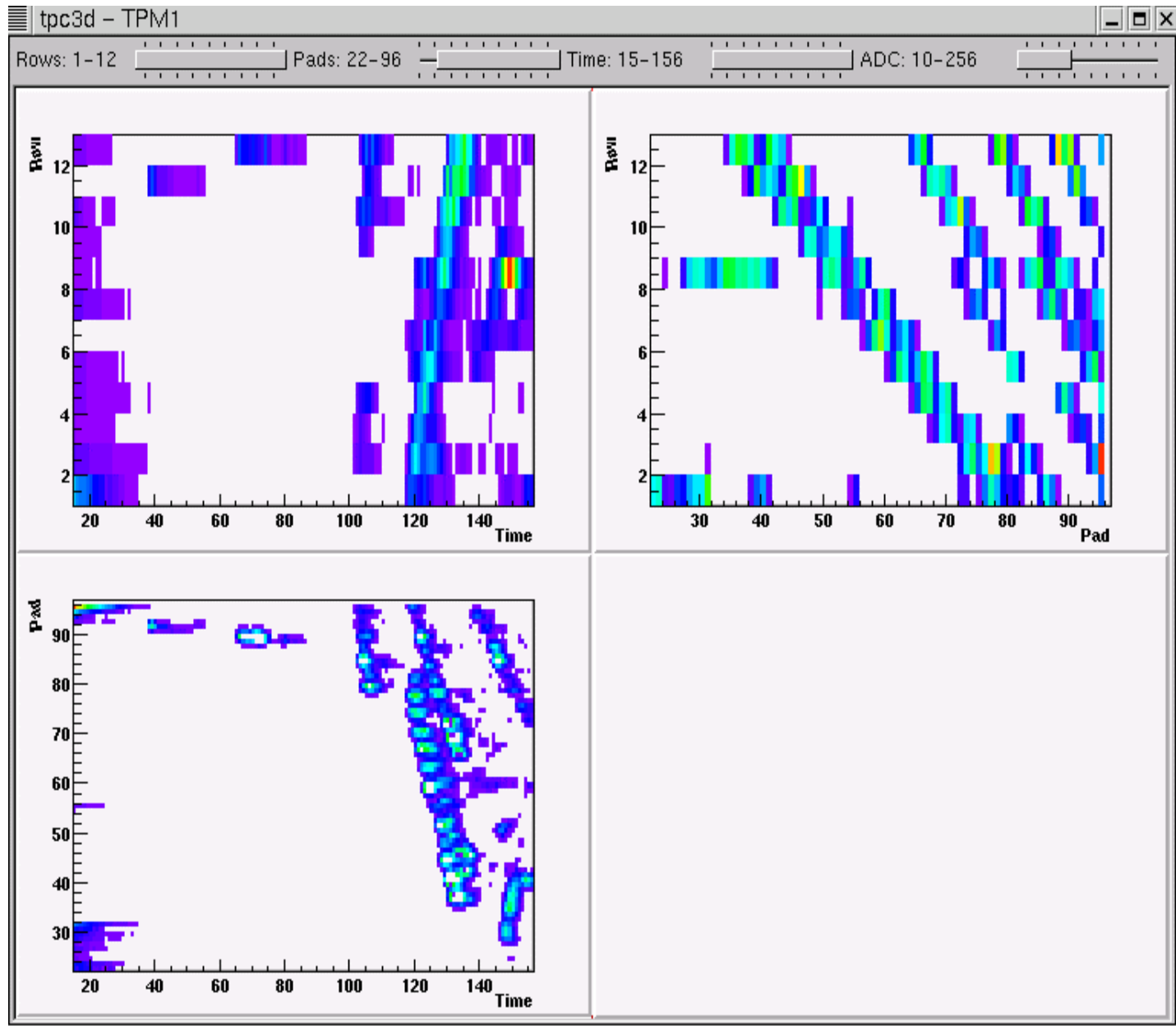
### Front and Back Forward Spectrometers



All magnets, detectors and control systems are in place.

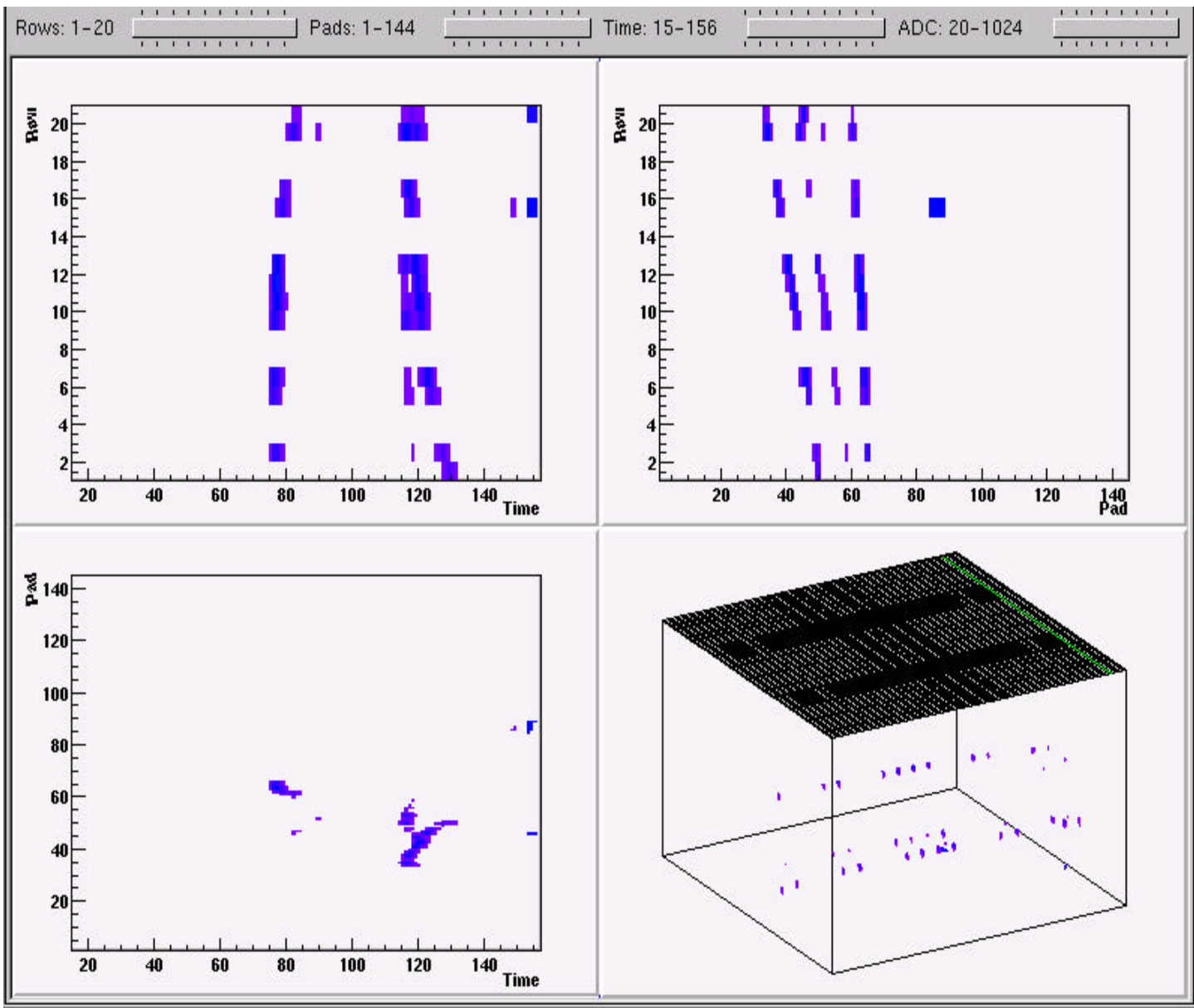
We started commissioning the detectors close to TD

# TPCs



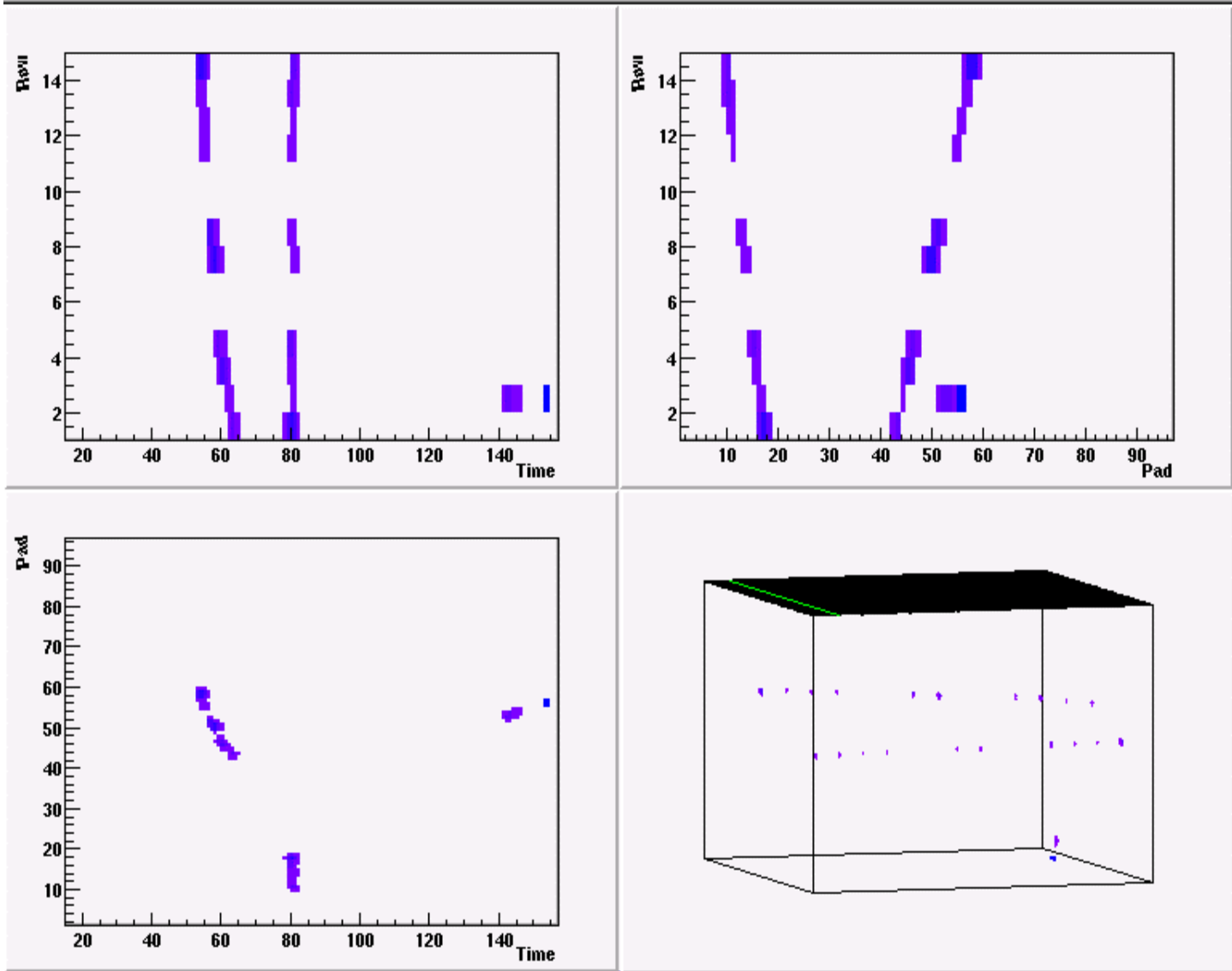
Tracks seen in **TPM1** with our online monitor



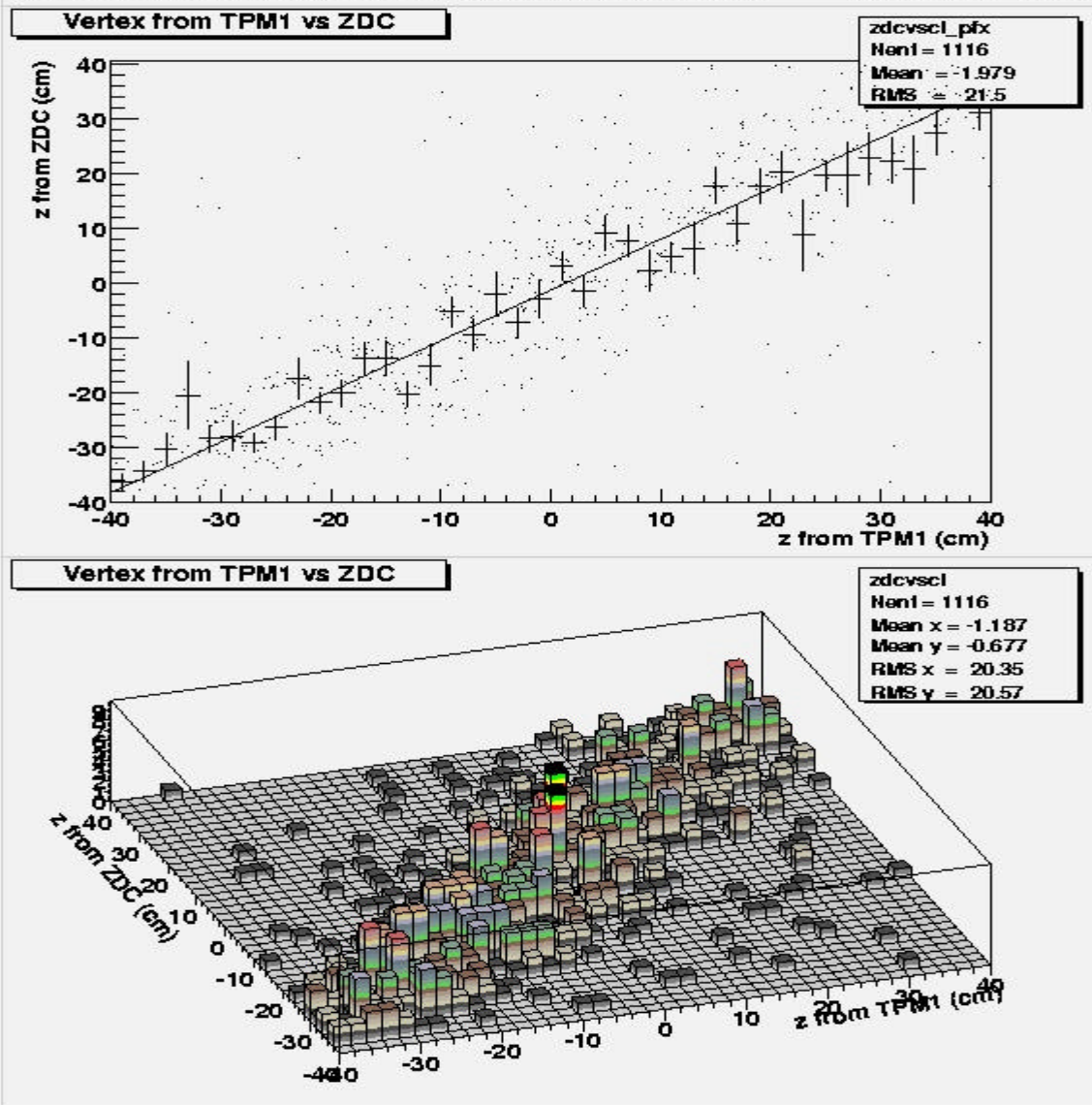


Tracks in **TPM2**

Rows: 1-14    Pads: 1-96    Time: 15-156    ADC: 20-1024



Tracks in T1



Correlation between  $z$  of vertex obtained from ZDC time differences and  $z$  of vertex reconstructed from tracks in TPM1.

## Status of other detectors

**T2:** under investigation.

**H1:** (time of flight) Operational, awaits tracking.

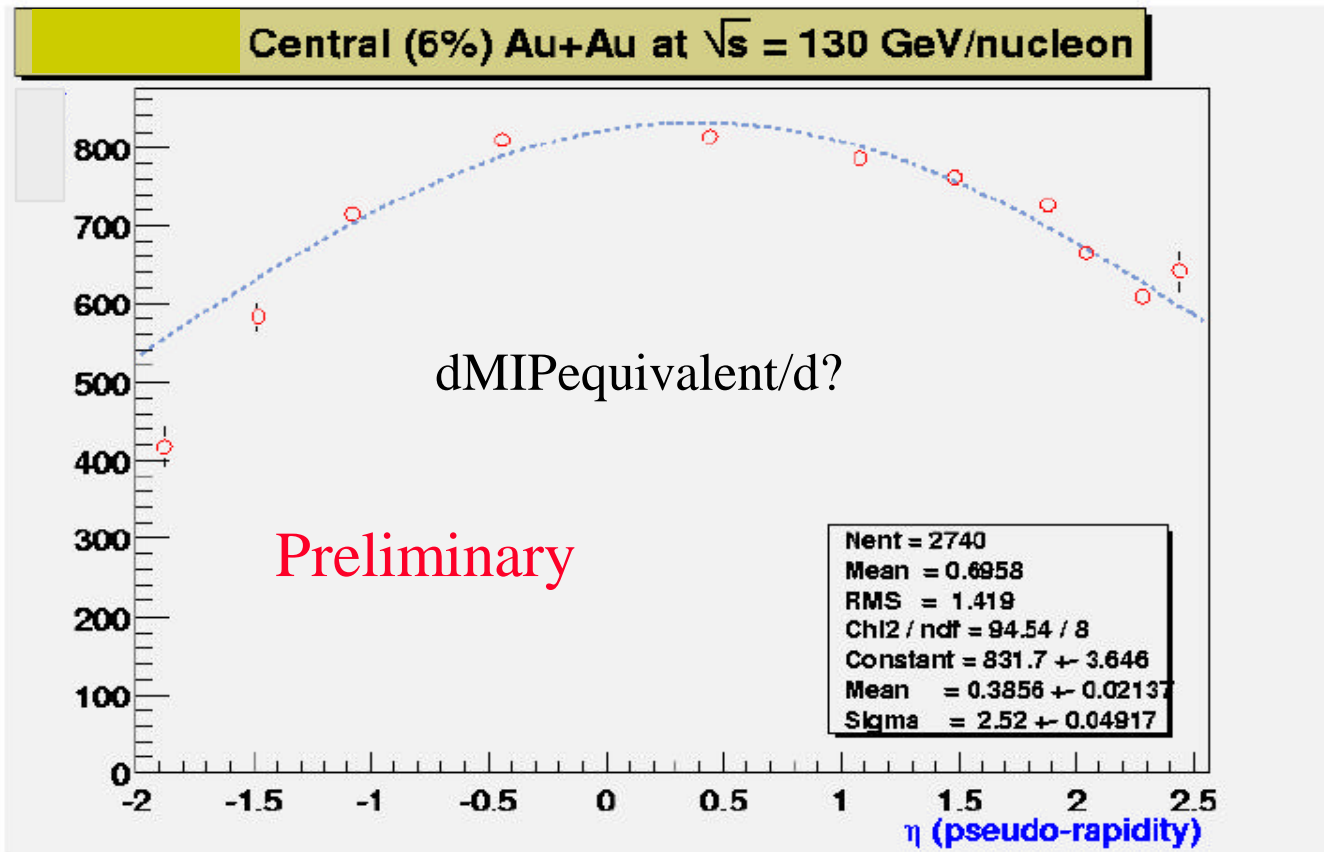
**C1:** (threshold Cherenkov) Operational awaits tracking.

**T3-T5:** (drift chambers) being commissioned.

**RICH:** (Ring imaging Cherenkov) Operational, awaits tracking.

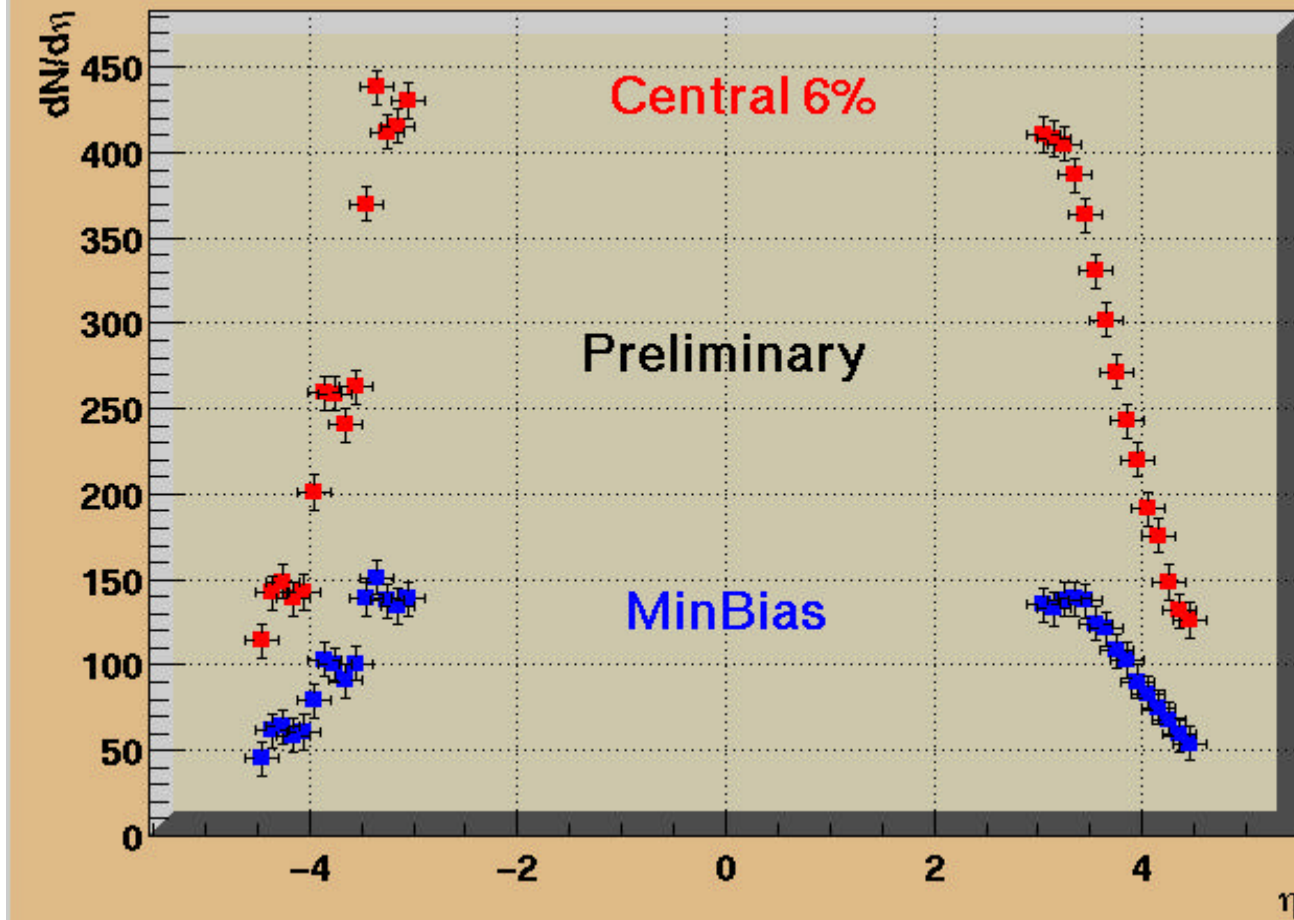
**Calibration chambers:** (drift chambers) two of them installed, one instrumented. Being commissioned.

**Drift velocity monitors for TPCs:** three installed and instrumented. Need to finalize safety review



This is an ongoing project; we suspect a systematic offset in the vertex position (from Beam-Beam) makes this distribution asymmetric and not centered at 0.

Our estimate for secondary interaction contributions is set to **30%** ( from Monte Carlo simulations ).



This distribution has not been corrected for vertex position and the contribution from secondary interactions or conversions is also not included.

## Plans for the rest of the 2000 run

- We are presently commissioning our Mid-rapidity spectrometer. And we expect to start our physics runs with it.
- Continue commissioning the Forward spectrometer.
- If the luminosity of the machine increases we will be able to do physics with both spectrometers during this run.