

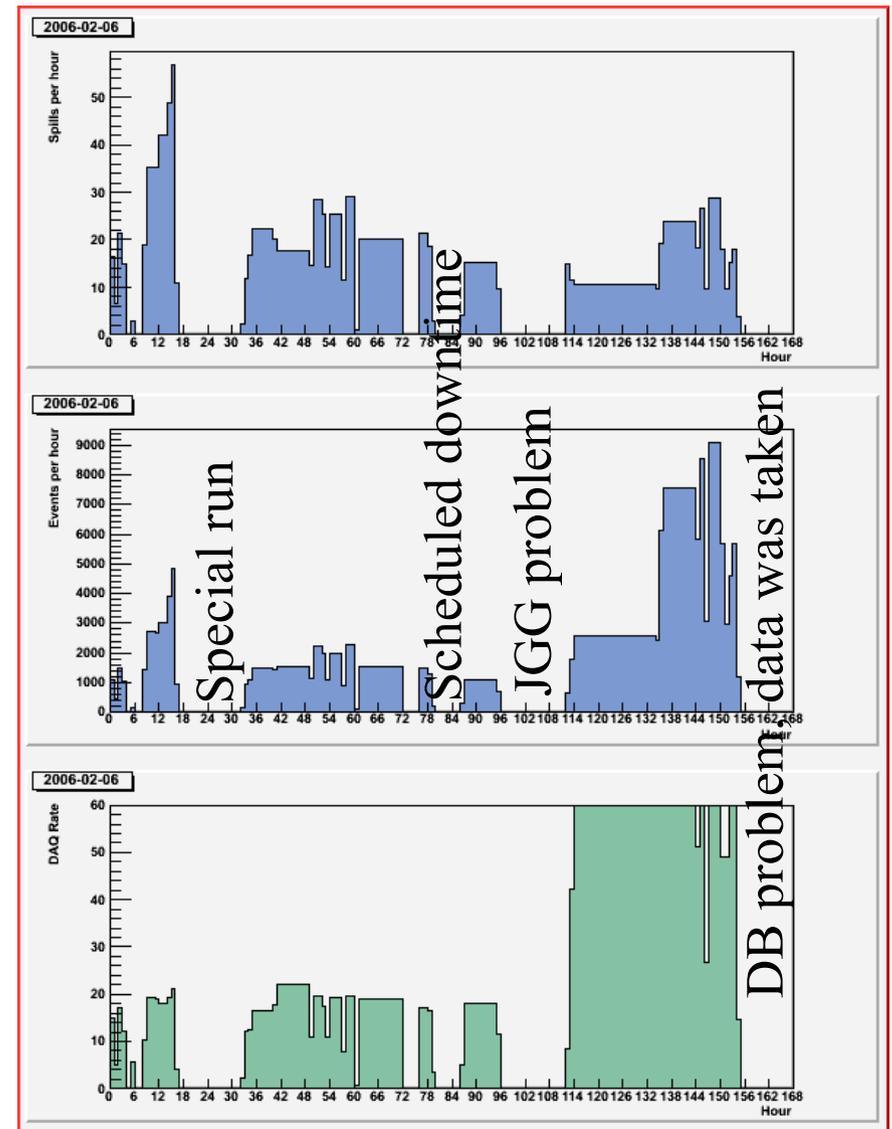
MIPP Status

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Fermilab All Experimenters' Meeting
2/13/06

- Statistics
- Special run at half B-field
- Beam and detector status
 - JGG failure

MIPP Event Statistics

- -59 GeV/c π /K/p beam
- Last week total:
 - ~330.000 events in 2034 spills
- Uranium (and empty) target:
 - 105.000 events
 - Additional 30.000 events in special run
- Kaon mass run:
 - 190.000 events
 - Limited data rate on saturday due to DAQ configuration error



Special run at half B-field · Why?

- MIPP took data with the JGG and Rosie magnets set to half of their usual currents
- TPC:
 - Particles leave tracks of ionization in P10 gas
 - Electrons drift in uniform electric field and project the track onto a segmented readout plane
 - Get x and y of track from position of hits on the readout plane.
Get z of track from drift time.
(Get dE/dx of particle from adc.)
 - Apply uniform magnetic field parallel to electric field to get particle momentum
- Distortions arise if the magnetic field is not uniform.
 - Data at half B field allows checks of the distortion corrections
 - In MIPP these corrections are several centimeters near the sides of the TPC
 - The distortion correction code has been working for many months, but needs to be fine-tuned

$$\frac{d\vec{u}}{dt} = \frac{e}{m}\vec{E} + \frac{e}{m}\vec{u} \times \vec{B} - \frac{\vec{u}}{\tau} = 0$$

$$\vec{u} = \frac{e}{m}\tau \left(\frac{|E|}{1 + \omega^2\tau^2} \right) [\hat{E} + \omega\tau(\hat{E} \times \hat{B}) + \omega^2\tau^2(\hat{E} \cdot \hat{B})\hat{B}]$$

$$\omega = \frac{e}{m}|B|; \omega\tau = v_{drift}|B|/|E|$$

$$u_x = \frac{e}{m}\tau \left(\frac{|E|}{1 + \omega^2\tau^2} \right) (\omega\tau b_z + \omega^2\tau^2 b_y b_x)$$

$$u_z = \frac{e}{m}\tau \left(\frac{|E|}{1 + \omega^2\tau^2} \right) (-\omega\tau b_x + \omega^2\tau^2 b_y b_z)$$

$$u_y = \frac{e}{m}\tau \left(\frac{|E|}{1 + \omega^2\tau^2} \right) (1 + \omega^2\tau^2 b_y^2)$$

Special run at half B-field · How?

- JGG and Rosie current settings are part of the MIPP beam permit.
 - Uninteraced secondary beam could miss the beam dump if both magnets have same polarity.
- Current interlock was bypassed for this special run.
 - Conditions: MC7/8 area must be vacant & MCR crew monitors magnet currents
 - Work on interlock hardware took ~15 minutes monday afternoon and tuesday morning.
 - Thank you to Mike Gerardi, the interlock group, and MCR crew.
- MIPP shifters were running the experiment remotely
 - DAQ, online monitoring, slow monitoring/control, event display all support remote operation · good software design
 - MIPP can be run from one laptop
 - Thanks to Mtest.

File Connection Configuration Prescale Sets

Stop Run Free run

Tue Feb 07, 2006 02:16:32

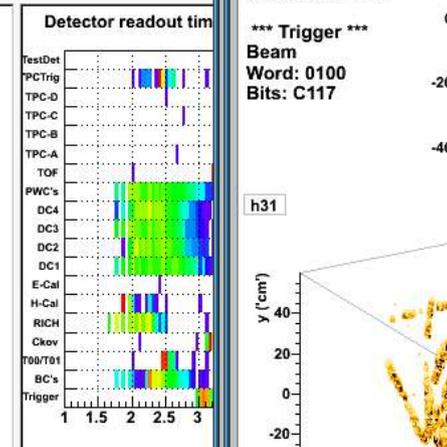
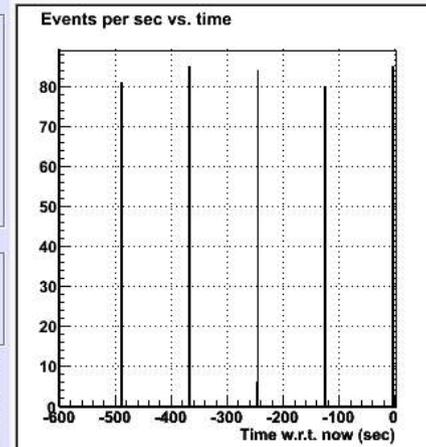
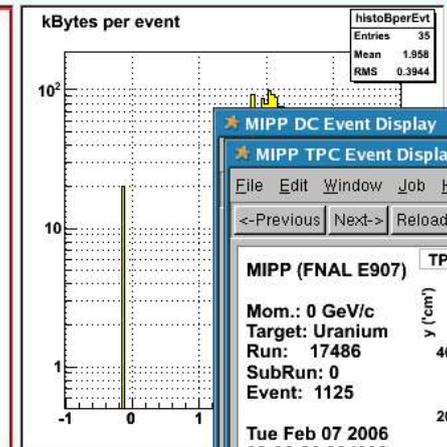
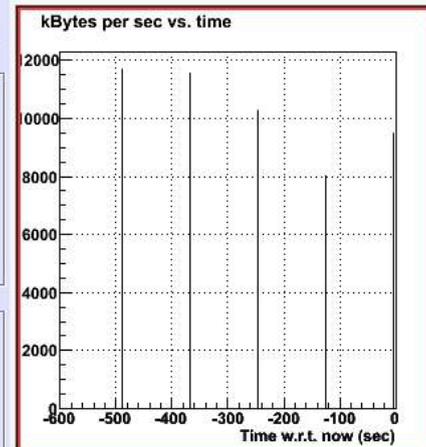
rcd Update
Tue Feb 07, 2006 02:16:33
Run 17486.0
Target: Uranium
Beam disabled
Run time: 0h40m42s [26s]
File size: 212 MB
of events in file: 1573
Run size: 212 MB

Events
Started: 1573
Completed: 1573
Assembled: 1573
Dispatched: 1573
TimedOut: 0

Sub-events
Missing: 0
Valid: 37752
Late: 0
Early: 0
Discarded: 0
Repeated: 0
Invalid: 0
Out Of Range: 0

Connections
Started: 24
Stopped: 0
Broken: 0

Network Size: 212 MB
Number of Clients: 24
Initial Time: Tue 01:35:53
Final Time: Tue 02:16:29



File Edit View Go Bookmarks Tools Help

Google Search

CRLW New Entry

2006 MCR E-Log Tue Feb 7 20... Accelerator Division Notification

MIPP log book

Search Index Log

Subscriptions Help

MIPP DC Event Display

MIPP TPC Event Display

File Edit Window Job Help

scan-evd.root [Run/Event]=17486 1125

MIPP (FNAL E907) TPC Front TPC Side

Mom.: 0 GeV/c
Target: Uranium
Run: 17486
SubRun: 0
Event: 1125

Tue Feb 07 2006 02:06:22.824998

*** Trigger ***
Beam Word: 0100
Bits: C117

h31

TPC Top

K) DC Plane Profiles

File Edit View Options Inspect Classes

Beam

Drift

MC7 air

TPC

MC primary

JC

RI

RI

RI

RI

RI

RI

RI

RO

Beam Chamber 3 Current

Drift Chamber 1 Current

Linux GxSC Meson Center Profiles v6.6 <Subtract noise>

Events: 85

MC2WC FS 43.4% MC7WC1 FS 40.5%

MC2WC FS 100% MC7WC1 FS 45.1%

MC5WC FS 100% MC2WC2 FS 16.2%

MC5WC FS 79.3% MC2WC2 FS 8.75%

bits (1475)

ShiftPlots

A) Spill quality
B) Experimental Trigger Words Latches
C) Interaction Trigger Majority Outs
D) BC Summaries

O) RICH Nhit by Channel

File Edit View Options Inspect Classes Help

RICH Channel Hit Map

Row Number

Column Number

DC Plane Profiles

DC Plane 1 Profile

DC Plane 2 Profile

DC Plane 3 Profile

DC Plane 4 Profile

DC Plane 5 Profile

DC Plane 6 Profile

DC Plane 7 Profile

DC Plane 8 Profile

DC Plane 9 Profile

DC Plane 10 Profile

DC Plane 11 Profile

DC Plane 12 Profile

DC Plane 13 Profile

DC Plane 14 Profile

DC Plane 15 Profile

DC Plane 16 Profile

DC Plane 17 Profile

DC Plane 18 Profile

DC Plane 19 Profile

DC Plane 20 Profile

MIPP Beam and Detector Status

- Beam over last week:
 - Beam profiles and intensity were good almost all the time when beam was delivered.
 - There was significant spray/beam halo early in the week
 - Not observed any more
 - Cause is not understood
- Detector:
 - JGG magnet: dead.
 - No other significant problems in any of the detectors

Jolly Green Giant

- upper-bottom coil pack fixed before installation in MIPP
- Electrical shorts between coils in lower-bottom coil pack in 2004 (after Ziptrack, before start of physics run) and on 3/20/2005
 - Coils were jumpered out, field strength and shape remained (almost) same
- Water leak on upper-bottom coil on 1/10/2006
- Water leak (missing hose clamp) on 1/28/2006
- Voltage imbalance since 2/4/2006 indicates coil-to-coil leakage currents
- Large water leak and coil shorts across both bottom coil packs on 2/9/2006
 - Smell of burned epoxy, water leaks in many places on 3 coils, visible damage to epoxy in many places
 - Experts and experimenters agree that JGG can not be operated until both bottom coil packs are rebuild.



MIPP Summary

- Due to the JGG failure MIPP ended data taking on nuclear targets on 9 Feb.
- MIPP will take data with the analysis magnets turned off until the accelerator shuts down
 - Measurement of Kaon mass