W.B. Christie, BNL

STAR Collaboration meeting

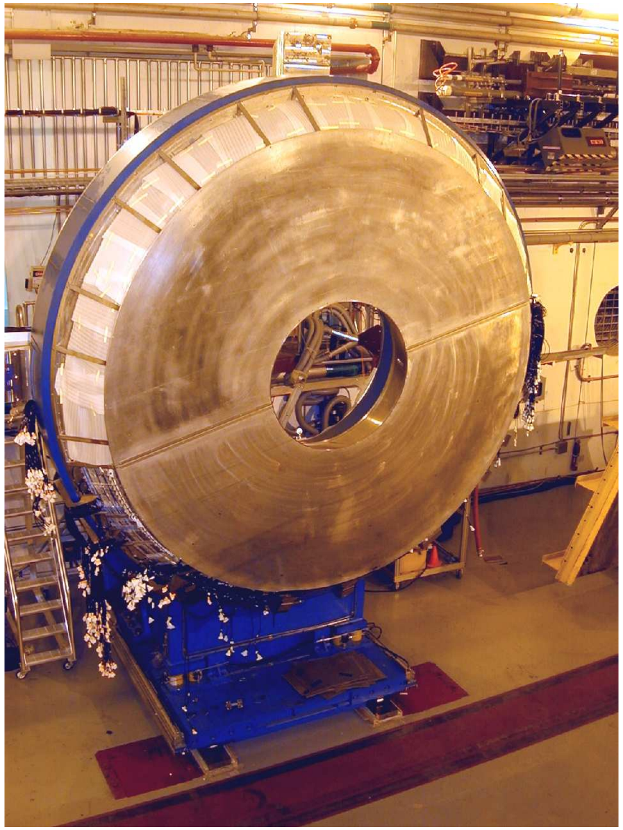
Michigan State University

August 13, 2003.

Outline

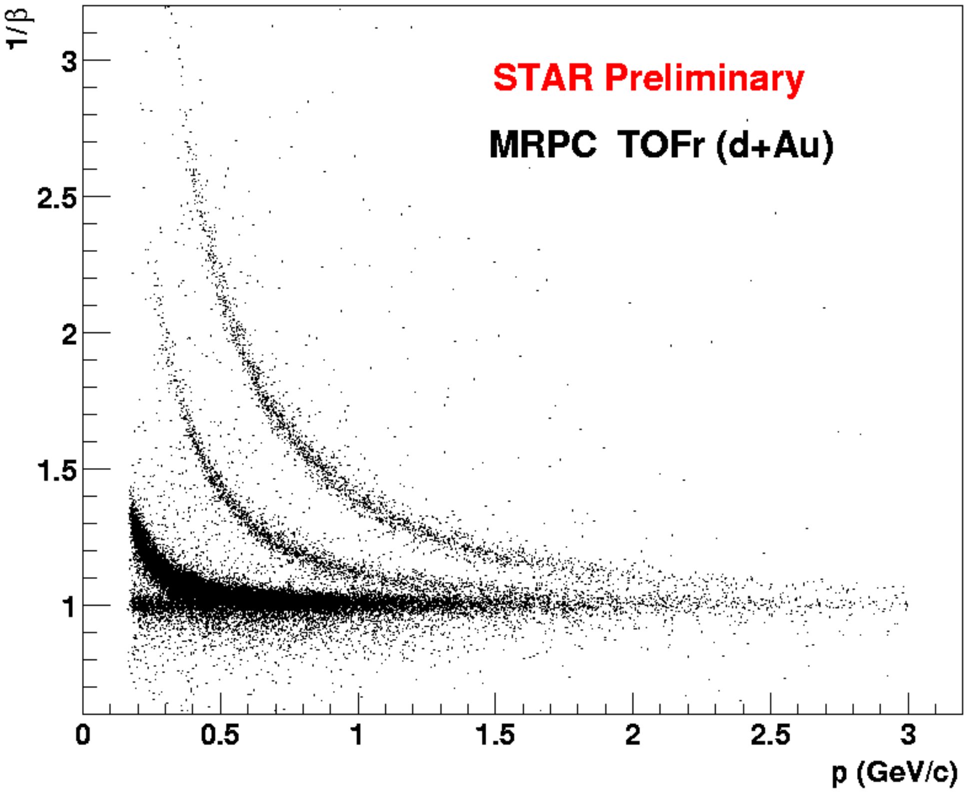
- Summary of Data acquired in the FY03 Physics run
- Summary of the Shutdown work and schedule
- Summary of the STAR Operations FY03

  Critique mtg
- Looking ahead to the FY04 Physics Run



Summary of Data acquired in the FY03 Physics run (1)

D-Au Run. Min bias Data Summary



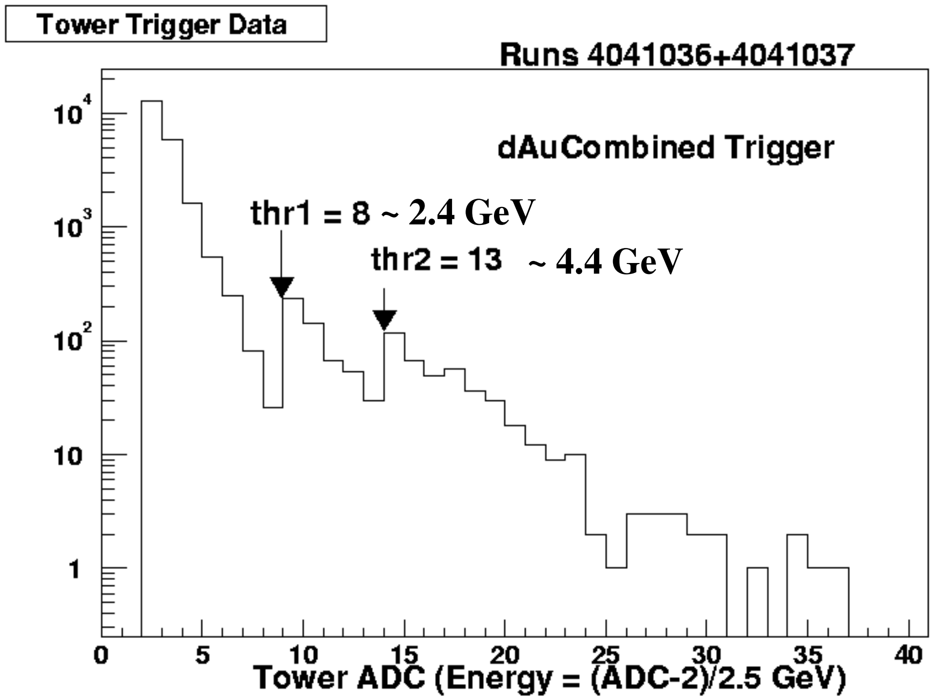
Small sample of the triggered TOF data set.

- The preliminary total for accumulated "min-bias" events for the dAu run are:
  - 19.2 Mevts @ B = -.5T
  - 16.5 Mevts @ B = +.5 T
  - 2.5 Mevts @ +.5T of TOF trg

Total 38.2 Mevts of min-bias. This is 38.2/70 ~ 55 % of the "min-bias" goal.

Summary of Data acquired in the FY03 Physics Run (2)

Summary of High Pt data goal for dAu run



Calculation of Integrated Luminosity sampled by our High Pt trigger.

1.) Use rough cross section for d-Au:

- $\sigma \sim 2.2$ b

2.) Look at ratio of High Pt2 events to minbias events, scaling minbias events up by prescale:

e.g. (1392/89,000*138) ~ 1.1×10^{-4}

3.) Normalize to d-Au cross section:

$(1.1 \times 10^{-4})(2.2\text{ b}) \sim 0.24$ mb

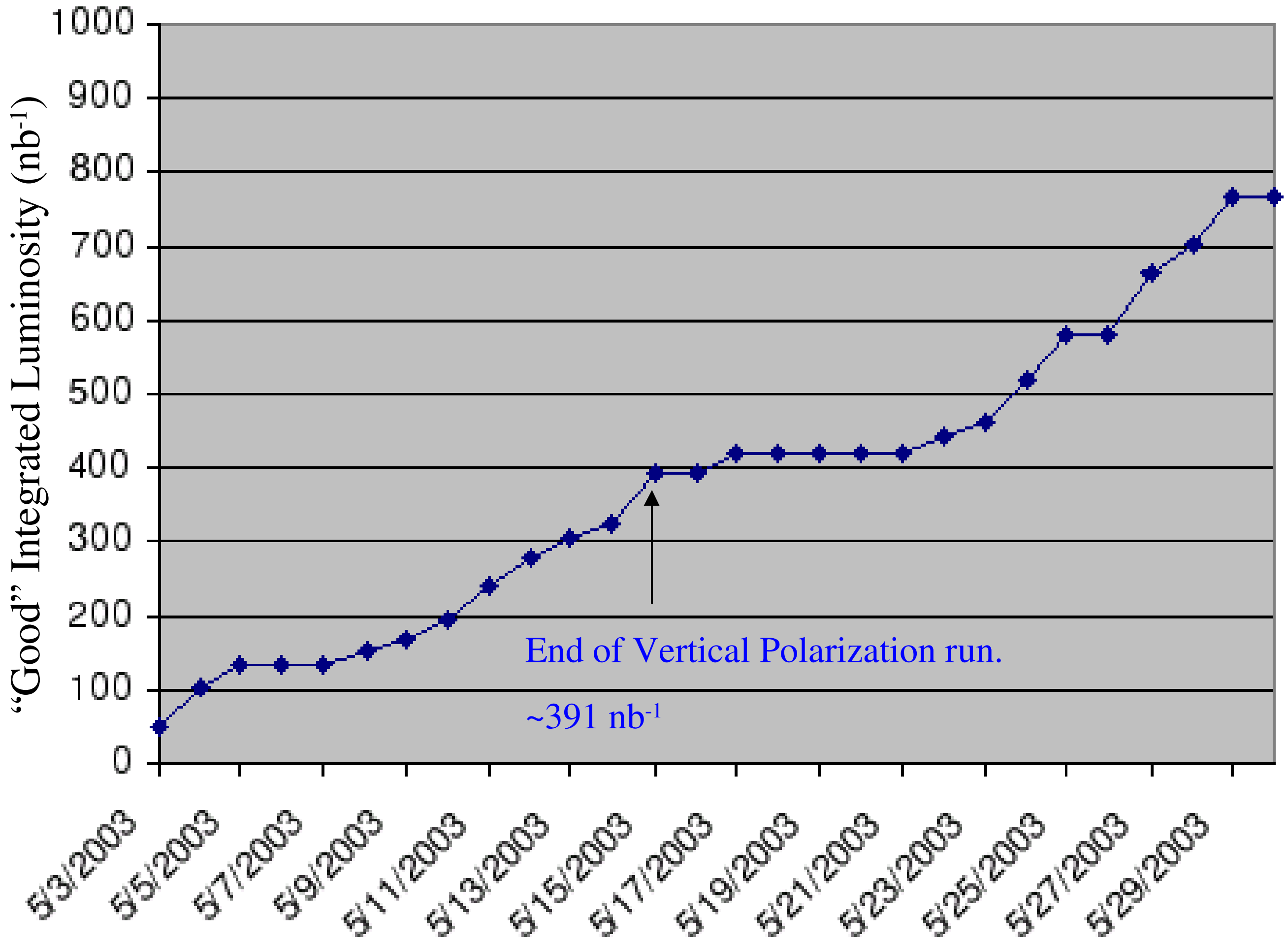
4.) Yield = $L^*\Delta t^*\sigma$ = 611.6 kevts

$\Rightarrow L^*\Delta t = 611.6\text{ k}/0.24\text{ mb} = 2.55 \times 10^{33}$ Note: $1/\text{nb} = 1 \times 10^{33}$

$\Rightarrow$ We "collected" 2.55 nb^{-1} ~ 2.55/25 ~ 10.2 %.

$\Rightarrow$ Accounting for STAR deadtime (~50%) C-AD delivered ~ 5.1 nb^{-1} (20.4 %) of 25 nb^{-1} to us.

Summary of Data acquired in the FY03 Physics Run (3)



Polarized Proton Run

Total for "Good" for Longitudinal Polarization ~ 373 nb^{-1}

"Good" ≡ Polarization of both beams > 20%, and reasonable background rates (usual caveat about A_N^{CNI}).

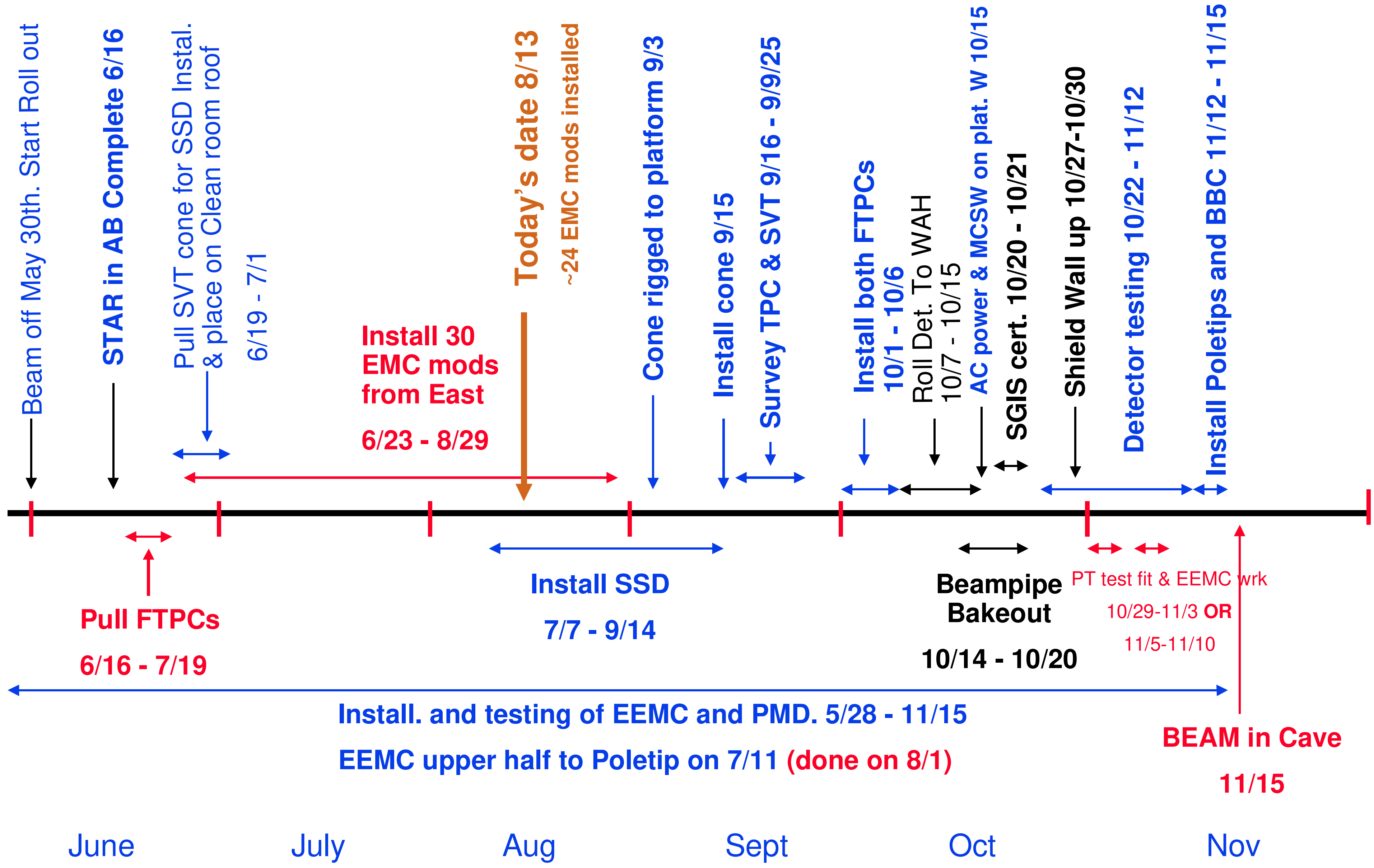
Summary for pp Run:

Vertical Polarization - **461** nb^{-1} **delivered, 391** nb^{-1} **"Good", Goal of 1000** nb^{-1}

Longitudinal Polarization - **444** nb^{-1} **delivered, 373** nb^{-1} **"Good", Goal of 3000** nb^{-1}

Summary Schedule for FY03 Shutdown

Revised (6/24/03)



General RHIC Operations in FY03 Run

Positive changes from previous year's runs:

- Scheduled Accesses:

These made commissioning, debugging, installation, and maintaining STAR systems much more efficient. Though some C-AD management is hesitant to admit it, it also appeared to increase the reliability of the Collider operations.

- Weekly Scheduling meetings:

This was also a success. For the most part these weekly schedules, discussed and agreed to on Monday afternoon, were held for the week. This was much more efficient, and aided STAR internal scheduling and planning. It also removed scheduling discussions/battles from the Wednesday RHIC Coordination/Progress meetings, making them more useful as well.

- More realistic Collider performance estimates prior to the run:

While the estimates still proved to be overly optimistic, STAR and PHENIX expectations were much more closely matched.

Agenda for the FY03 STAR Ops "Critique" meeting

STAR

9:00 - 9:15 Welcome and Statement of the Purpose of the Meeting (T. Hallman and/or B. Christie)

Critique of Detector Operations (W. Christie, Chair)

9:15 - 9:40 Discussion of Run Control Ops (J. Landgraf)

1) critique by sub-system manager
2) action plan/possible changes
3) discussion by all

9:40 - 10:00 Discussion of DAQ Ops (T. Ljubicic)

1) critique by sub-system manager
2) action plan/possible changes
3) discussion by all

10:00 - 10:20 Discussion of Trig Ops (H. Crawford)

1) critique by sub-system manager
2) action plan/possible changes
3) discussion by all

10:20 - 10:35 Break

10:35 - 10:50 Discussion of Level III Ops (T. Kellogger)

1) critique by sub-system manager
2) action plan/possible changes
3) discussion by all

10:50 - 11:05 Disc. of Slow Contr. Ops (Mailed in comments by M.C)

11:05 - 11:20 Discussion of On-line QA (S. Panitkin)

1) critique by sub-system manager
2) action plan/possible changes
3) discussion by all

11:20 - 12:00 General Discussion of Run Control, DAQ, Trig, Online, level III, slow controls (critique of experience; problems, successes, needed improvements) T. Ljubicic, moderator

12:00 - 1:00 Lunch

1:00 - 1:15 Discussion of TPC Ops (A. Lebedev)

1) -> 3.) (I.e. same as morning presentations)

1:15 - 1:20 Discussion of Magnet Ops (R. Longacre or designee)

1:20 - 1:35 Discussion of EEMC Ops (J. Sowinski)

1:35 - 1:50 Discussion of SVT Ops (D. Lynn)

1:50 - 2:05 Discussion of FTPC Ops (A. Lebedev)

2:05 - 2:20 Discussion of TOFp/TOFr/VPD Ops (B. Llope)

2:20 - 2:35 Discussion of FPD/BBC Ops (L. Bland)

2:35 - 2:50 Discussion of EMC Ops (TBD)

2:50 - 2:55 Discussion of PMD Ops (S. Chattopdhyay)

2:55 - 3:05 Break

3:05 - 3:20 Discussion of Fast Offline QA (G.V. Buren)

3:20 -- 3:25 Interlocks & ES&H perspectives (W. Christie)

3:25 - 3:45 Training for Operation of Detector (T. Hallman) Involvement of STAR Collaborators in running & certification process i) critique of experience from Fy03 Physics run

ii) action plan/possible changes iii.) Discussion by all

3:45 - 4:05 General RHIC Ops (as relevant to STAR Ops) (B. Christie)

i) critique of experience during run and report from RHIC Retreat

ii) action plan/possible changes iii.) Discussion by all

4:05 - 5:30 Round Table Discussion

* Capturing of Action Items/Action plan for systems/topics

* Discussion of suggestions sent in by collaborators not able to attend mtg

* Operating the STAR Detector: staffing of shifts, period coordinator experience, Detector Operator exp., Shift leader exp., Shift crew exp., ease of detector operation, shift plan communications, etc: problems, plus's, needed improvements (B. Christie moderator)

5:30 Adjourn

Few Points from the FY03 Critique meeting

STAR

Run Control and DAQ:
- Will clean up GUI a bit
- Pick up “base” trigger rates for pre scales
- Work on configuration algorithms
- Reconfigure to “join” sub systems based on deadtime, to allow more simulataneous triggers.
- Web based (with larger font) monitoring screens with historical graphs (e.g. deadtimes)
- Easy display to monitor data transfer to RCF
- Plan to run with DAQ100, need QA buy in from Collaboration
- Propose/plan not to ship all events to L3

Trigger:
- New TCU functionality (Halt and pre/fol protection)
- New scaler readout and Network software to increase speed
- Rewrites of L1 & L2 to clean up and increase speed
- Come up with a proposal to reduce “Tier 1 file proliferation”

L3:
- Fix minor hardware problems
- Run in “express stream mode” during Run 4

Online (aka “Panitkin”) QA Plots:
- Make saving of histograms automatic
- Change so that it isn’t necessary to wait for histogram writing before starting next run
- Reorganize plots (small set for shift QA, larger sets for detector experts
- Easy way to generate, and compare with, reference plots

Few Points from the FY03 Critique meeting (2)

Subsystems:

- EEMC expects to transition to shift operation sometime during Run 4
- SVT would like top see implementation of “Access checklist”
- TOFp tray may be relocated
- BBC brings up possible need to deal with ADC saturation during Heavy Ion running

    Two ideas - split signals to ADCs and attenuate one, or lower gains
- FPD plans to complete West side installation
- BEMC will replace EPROMS to solve main pedestal problem with Jet trigger
- BEMC still working on diagnosis and cure for problem of failing crate power supplies
- PMD needs good Heavy Ion pre-trigger, will be fully installed and instrumented for Run 4

Shift Crews and Shift Sign-up

- Overlap days need to be taken seriously
- Efficiency of shift crew to get detector up and taking must be worked on and quantified
- Training shifts should be scheduled later in the run (when probability of beam is higher)
- Suggestion to change composition of Shift crews (1 SL, 2 DO, 1 C, +Ts)
- Tune shift sign-up to ensure at least one DO has recent experience

Complete minutes available via the STAR Operations Web page.

Looking Ahead to the FY04 Run

C-AD Plans for next year's run:

- **"Physics Development mode":**

What C-AD is proposing is that after the five week "Set-up" and "Ramp-up" phase for a given beam configuration that Luminosity development continue during the "Physics Running" 8:00 am to 4:00 pm Monday through Friday.

Concerns:

Current Schedule calls for the "Physics Running" to start about December 22nd. Concern is that to effectively use the holiday period (I.e. time until about January 2nd) that we must have STAR commissioned, and at least a final min-bias trigger set-up before this time.

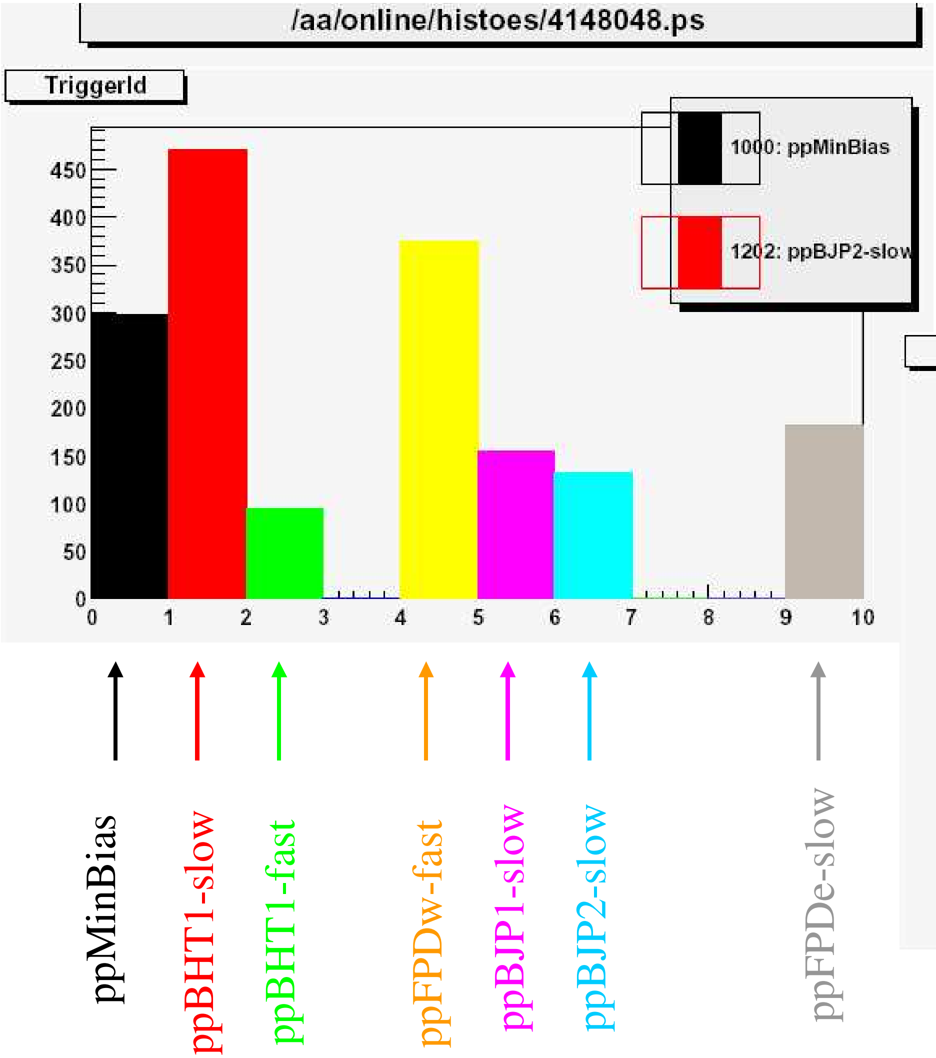
QM04 in mid January will pull a number of people out of town. We'll need a careful plan for commissioning of the higher level and "rare" triggers to effectively make use of beam time in January.

With "Physics Development mode" (PDM) running, for STAR to get its 45 hours per week of "spinning tapes", the uptime for the collider and STAR will have to be much larger than we seen in the past.

45 hrs/wk/(168 hrs/wk - 12 (beam Exp.) - 8 (access) - 40 (PDM) =108 hrs/wk) ~42% !

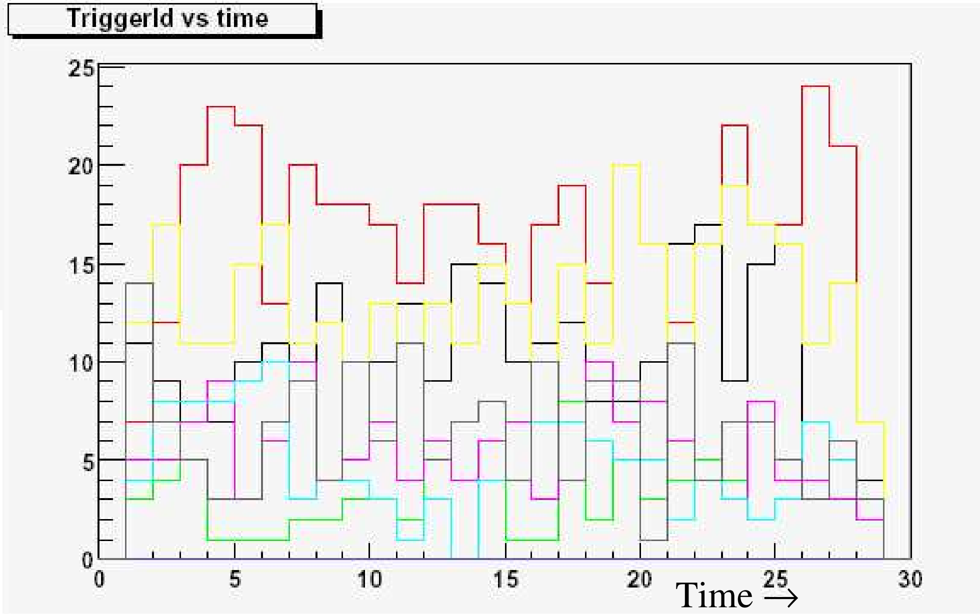
Looking Ahead to the FY04 Run

More complex mix of triggers to optimize use of bandwidth and livetime.



ame trg_mip_ppspin_030528.bin

name	binary(daqTrgId)	offlineTrgId	numberOfEvents
ppMinBias	1	1000	10531
ppBHT1-slow	10	1101	18090
ppBHT1-fast	100	1104	5442
ppFPDw-fast	10000	1005	25676
ppBJP1-slow	100000	1201	5622
ppBJP2-slow	1000000	1202	5444
ppFPDe-slow	1000000000	1003	6571
ppFPDe-fast	10000000000	1004	23348
ppEHT1-slow	100000000000	1151	5825



Monitor time history of trigger mix for stability

Summary

• We fairly well followed the FY03 BUR plan for the last run, and accomplished most of the goals that had been set.

• We've evolved the operating capabilities of the STAR system (triggers, rates, running modes, new sub systems, etc.) dramatically every year, and are planning to continue this evolution (rates, DAQ100, parallel Event builders, L2 triggers and aborts, etc.) in the FY04 run.

• We are going to have to perform efficiently and effectively to achieve the accumulation of the large data sets (~ 100 Mevts etc.) that people are starting to contemplate and request.

  • Improve Shift Crew efficiency

  • Reduce fraction of accumulated events which are labeled as "bad" and tossed.

  • Improve detector performance (e.g. deadtime) monitoring, diagnosis, and recovery.

  • Continually work on overall robustness of detector operation

• Schedule for the FY04 run presents some schedule issues that we'll have to plan for.

• **It's time to reflect on our past successes, look forward to our future challenges, and enjoy the reception on the roof of BPS.**