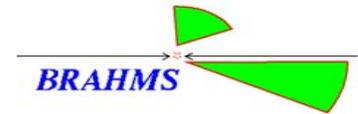
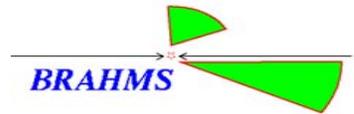


# OVERVIEW



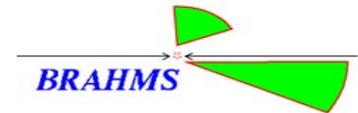
- Run Planning
  - Beams, periods
  - RHIC-exp coordination/communication
- Experimental improvements
  - Detector changes
  - Enhancements to increase exp data efficiency
  - Background Issues
  
- Only 10 min so this will be brief!

## Run Planning



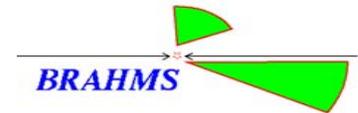
- Au-Au run successful. Achieved  $\sim 35\%$  (of revised) goal from RBUP.
- PP run moderately successful
  - Implemented triggers and Inelastic counters
  - Review of data taken has revealed several problems related to triggering and beam conditions (particular early running).
- Experiment requests for future runs (FY03, FY04) as assessed now.
  - Based on last RBUP and some collaboration discussions in January.
- Priority I
  - Additional running for Au-Au at 200 GeV. Collect  $\sim 200 \mu\text{b}^{-1}$  in  $\pm 20$  cm vertex region. (Run 2 accumulated  $\sim 30 \mu\text{b}^{-1}$ )

## Run Planning



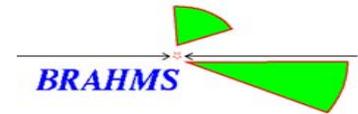
- **Others (not prioritized at this point)**
  - Light Ion (Si-Si) at 200 GeV equivalent to  $\sim 100 \mu\text{b}^{-1}$
  - D,p Au comparison runs
    - Asymmetric acceptance, Blue(d) projectile fragmentation Yellow(d) target x region.
    - **Brahms may want d in both rings.**
  - Polarized pp (200 GeV) (transverse Polarization)  $X_f \sim 0.2-0.6$ 
    - **Needs high luminosity and polarization to be feasible**, and then 1-2 weeks.
    - The transverse polarization is of course not the major RHIC emphasis for SPIN.
  - PP at 500 GeV and longitudinal spin not in Brahms program, except for completion (at 200 GeV) of comparison data (that does not require spin).
- Preference is to start with Au-Au at 200 GeV
  - End of last run a good starting point to achieve physics results quickly rather than spending development time on new species.
  - This will also serve as a realistic gauge about combined machine+exp performance under routine operations.

## RHIC-exp coordination



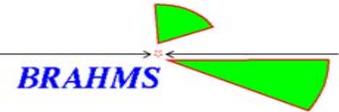
- Long and short term coordination
  - RBUP
  - Short term endeavors (as 20 GeV) that may requires exp modifications should be known/discussed more than a few weeks ahead.
  - Weekly, Daily planning.
    - Overall experimental reqs, and beam experiments,developments should preferentially be known on a weeks schedule planned/known before the time- and Wednesday meeting.
    - Daily changes should be kept to emergencies, or if weekly plans do not pan out.
  - Planning for scheduled weekly access period
    - Benefits: experts can be available
    - May reduce the on spur of a moment requests
- Others
  - Updating of MCR TV, particular in repair, down time periods.
  - Information on beam changes
    - E.g. scrapers/collimators moves in/out
    - Polarizations measurements.
  - Revisit rules for dumping store.
    - Hopefully developing of longer stores and a more efficient cycle between stores will make this less of an issue.
    - Many stores in last runs was kept too long.

## Experiment Improvements



- Upgrades to Brahms Detector system will be minor before next RHIC run.
  - Aim to increase reliability of detector systems
    - HV distributions
  - Aim to increase efficiency of data taking
    - Improve trigger sub systems
      - Spectrometer triggers for Au-Au. Pp experience was very useful –
      - Large rejection factors, high efficiency.
      - Improve on Vertex selection (using ZDCs)
    - Can utilize higher luminosity.
- Machine considerations ( Increase luminosity and availability )
  - Request **200 MHz** re-bunching for all species and energies.
  - **Zero crossing** angle at 2 o'clock ; does not improve useful luminosity but make conditions (vertex pos) less susceptible to steering changes.
  - **Beta\*** = **1m** would be of large benefit. Essentially all the last years runs were below band width limit. Preferred over 110 bunches. An increase of L with no increase in background.
  - 100 bunches also add in-time background (BFS arrival time == time for next bunch tunnel background).

## Trigger and data Rates



Time in store	Vertex trigger Rate	Event Rate
0-1	51/sec	94
1 h-2.5	31	60
2.5-	17	34

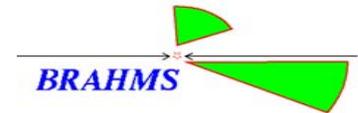
An example of a high luminosity store.

Initial ZDC rate  $\sim 1300/\text{sec}$ .

Brahms event rate limit  $\sim 120/\text{sec}$ .

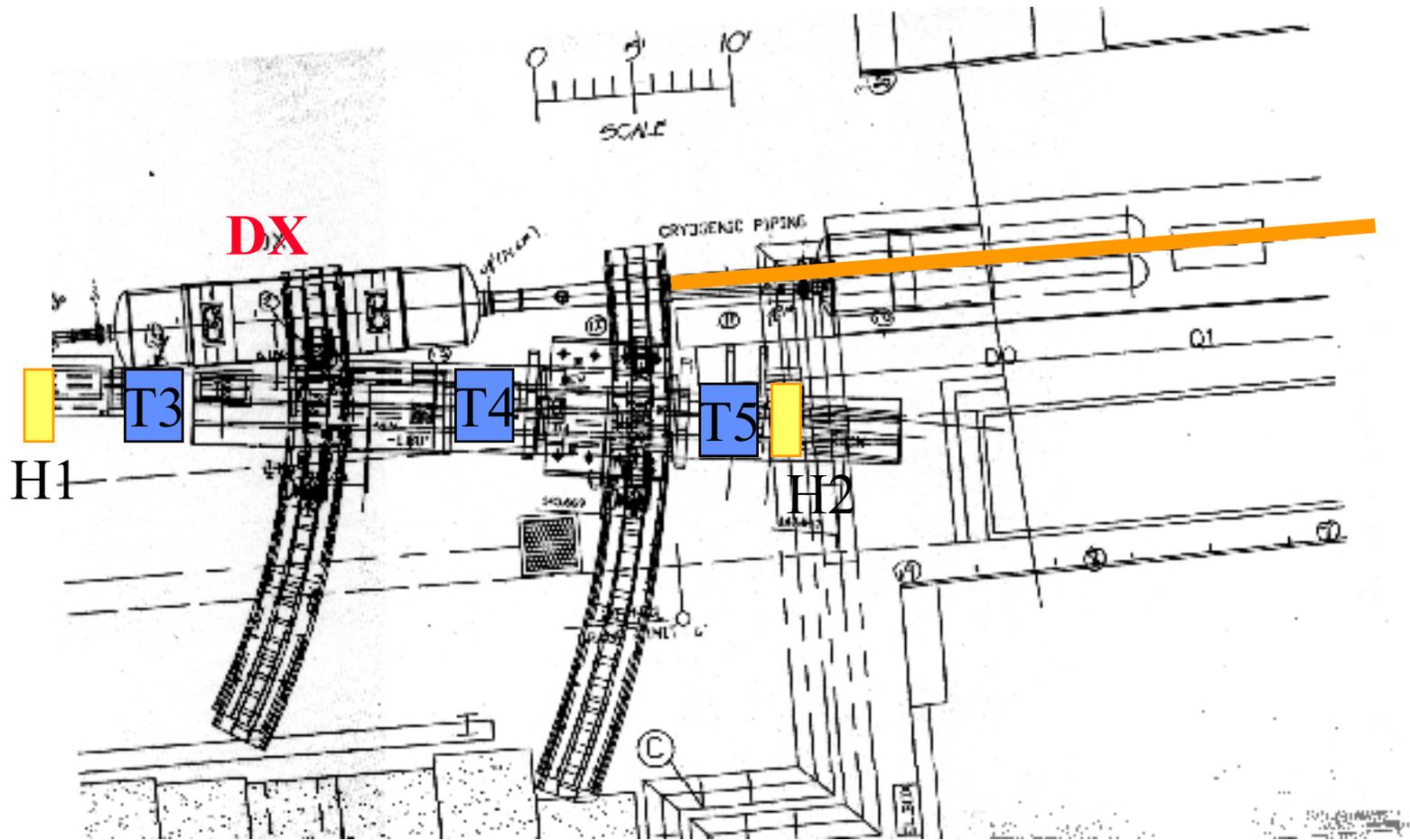
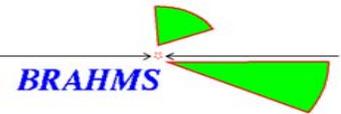
Obvious benefit to maximize luminosity. The time to perform a given Physics reduced by 1.6-2.

## Background issue.

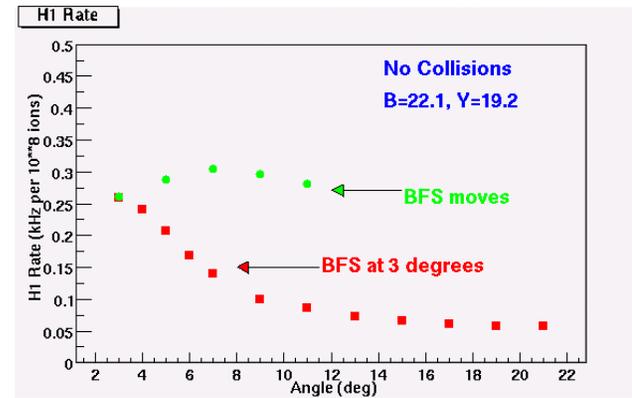
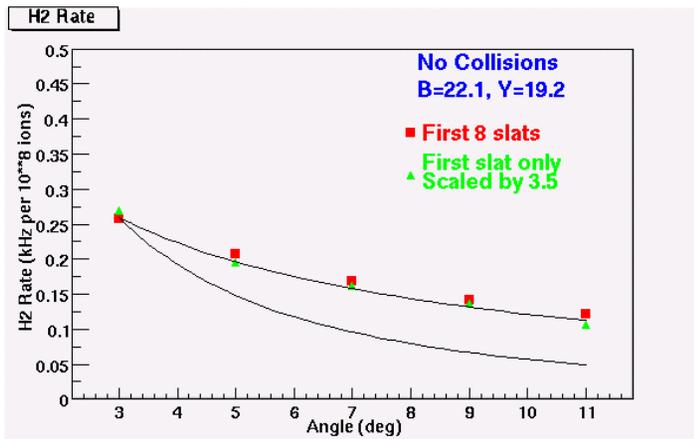
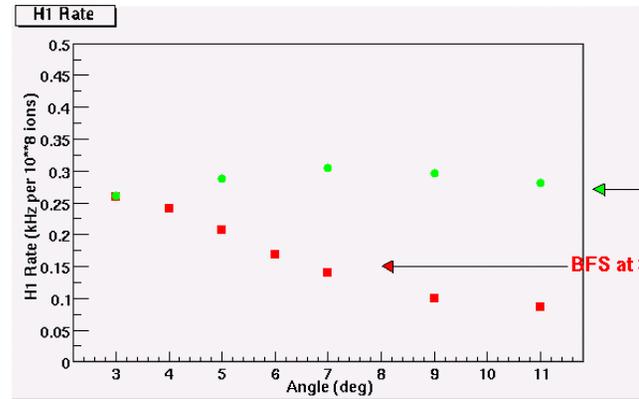
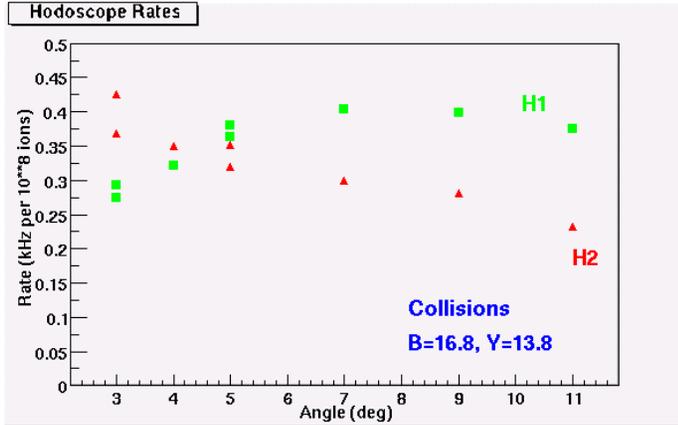
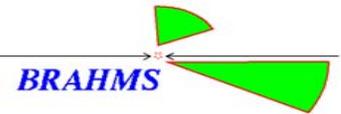


- The background rate in spectrometer hodoscopes and currents in Drift Chambers was much higher than anticipated based on collision rates.
- Measurements were done to identify this problem and source.
- The relevant part of the 2 o'clock and Brahms layout is shown in next slide.
- Note DC and hodoscopes H1, H2.
  - Studied rates vs. spectrometer angles. (see subsequent slides).
  - Rates for H1 increases as moves away from beam
  - H2 rates falls off much approximately as  $1/r$
  - Rates are dominated by non-collisions rates
  - Consistent with extended source along beam components
    - Shadowed by BFS magnets for FFS.
  - A dosimeter measurement was done; installed for a few day sets along the beam line, DX and D0 towards 3 o'clock.

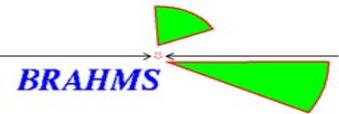
# Brahms IR (Back FS)



# Beam Background Info



# Dosimetry results



Even though this is integrated over many fills and stores, It points to a significant loss, source near Q2, also during stores. This is qualitatively in agreement with rate measurements

Q: Are there machine improvements, or operating modes than can improve on this. What diagnostics are needed? Brahms is actively pursuing options for installing shielding for detectors (attached, permanent)

March 6, 2002

