RHIC Retreat 2002

** *FNAL perspective* **

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Champagne !!

(thanks, Steve(s))

- **Congratulations to great successes --**
  - **both Au-Au, polarized p-p**
- **Luminosity --**
  - **Au-Au meets / beats FNAL challenge**
  - **p-p @ 10^{30}; great for first run!**
    - **Tevatron best ~2×10^{31}, includes x10 due to γ!**

Physics -- HIP,HEP,AP

- Important for physics --
  - Nuclear physics / High energy physics
  - ... but also, Accelerator physics
- And, great experience leading to LHC, and future
  - SC accelerators, p-p, new accelerator physics
- Should result in many new studies, talks, papers, etc.

Accelerator Physics

- Emittance preservation
- Instability issues -- electron cloud, etc.
- IR control/correction --
  - correction of 2 separate beams; many IR's, ...
- bb effects
- Intra-Beam Scattering
- γ_t crossing

Much will be learned from this machine, which will impact existing and future colliders…

Operations

- Control of separate proton beams in collision
  - p-p: ISR ---> RHIC ---> LHC ---> ?
- Tune monitoring/control -- PPL: good start
- Chromaticity monitoring/control
  - harder for hadrons; operational systems in hadron colliders are not “typical”
  - good test-bed for future required systems
- Instrumentation
  - In search of new “observables” and techniques
  - ... need for documentation of conditions

Operations (cont'd)

- Beta squeeze along the ramp
- Availability -- will come with experience; run, run, run!
  - 2 synchrotrons !
  - Continue gathering/studying operations statistics
  - Turn normal operation over to OPS ASAP
- Scheduling/meetings -- make "habits"; know what to expect at which meetings
  - Perhaps look at placement of meetings during the week; do they make sense?
- Set-up time: looked "quick" to me during pp run; but takes time to get this down
  - Run I @ FNAL: 2-3 hours; Run II @ FNAL: now, 30 mins. or so...

Availability -- FNAL

- **Available time = (hours in week) - (scheduled shutdown time)**

- **Up time = store hours + studies hours + set-up time**
- **Down time = component failure + investigation of store loss + start-up + misc.**

= Available time - Up time

Availability = (Up time)/(Available time)

~ 65-80% , typically at FNAL

Stand-outs...

- From AP point of view, great machine for AP studies
  - Share common experiences -- beam-beam, emittance preservation, IR correction, etc.
  - Study new phenomena such as IBS, e^- cloud, etc.
  - Many potential beam experiment collaborations w/ other labs
- Acquire better communications skills for operation
  - Organized, predictable meetings & responsibilities
  - Generate schedules and use hierarchy of designated decision makers
  - ... will come with time ...

Final comments

- **Nicely organized Retreat**
  - **Good discussions; technical details, not fluff; should be very useful for future of RHIC**
  - **Plenary seems to work better than Parallel sessions**
    - **Fermilab experience as well**
  - **Too many talks? Perhaps, but important dialogues!**
  - **Don't change format (including invitation list ;-)**