PHENIX Run-10 Preparations

Stefan Bathe

PHENIX Calendar

- Detector installation complete for Run 10 — done
- Safety system, magnet, and detector setup and testing — current
- Rack room air conditioning upgrade — current
- Half the IR air conditioners still need service — waiting
- Shield wall closes, end of shutdown — Nov 30
- Start of Run-10 — Dec 1
  - Watch shifts
  - Flammable gas
- Full 5-person shifts — Dec 15

Goals for 200 GeV Au+Au

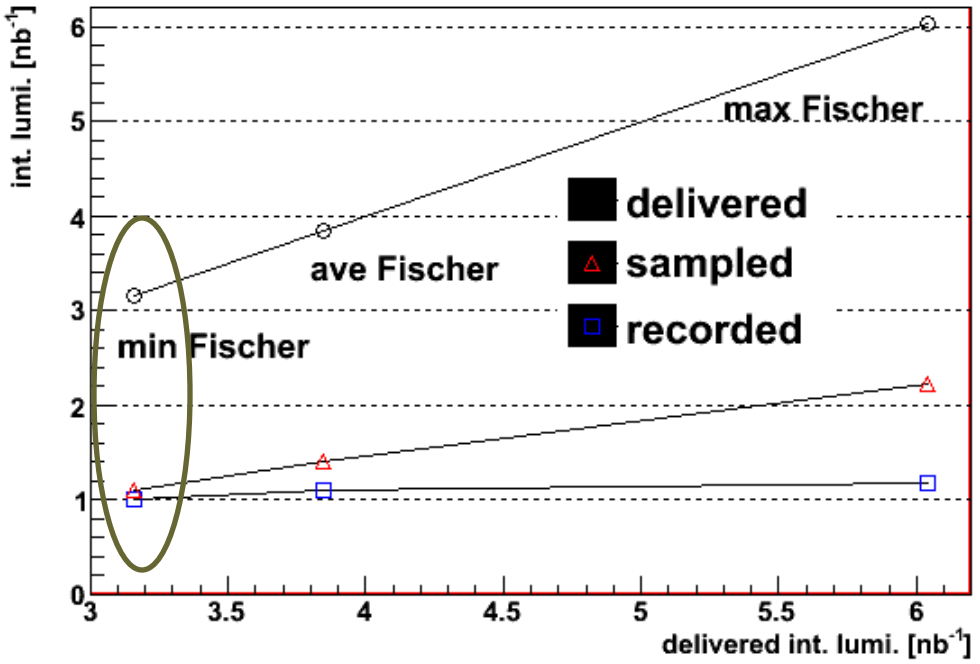
- PHENIX Beam Use Proposal (June 2, 2009)
  - Highest priority: record 1.4/nb of 200 GeV Au+Au, utilizing HBD
  - Will provide low mass dilepton spectra good enough to search for medium modification of ρ, ω, ϕ
- Estimate of recorded data set based on latest Fischer projections:
  - Average scenario: 1.1/nb
- Average scenario constitutes PHENIX minimum goal
- If 1.1/nb recorded in less than 10 weeks, want to continue running at 200 GeV to get as close to 1.4/nb goal as possible

BACKUP SLIDES

SCENARIOS

Minimum Scenario

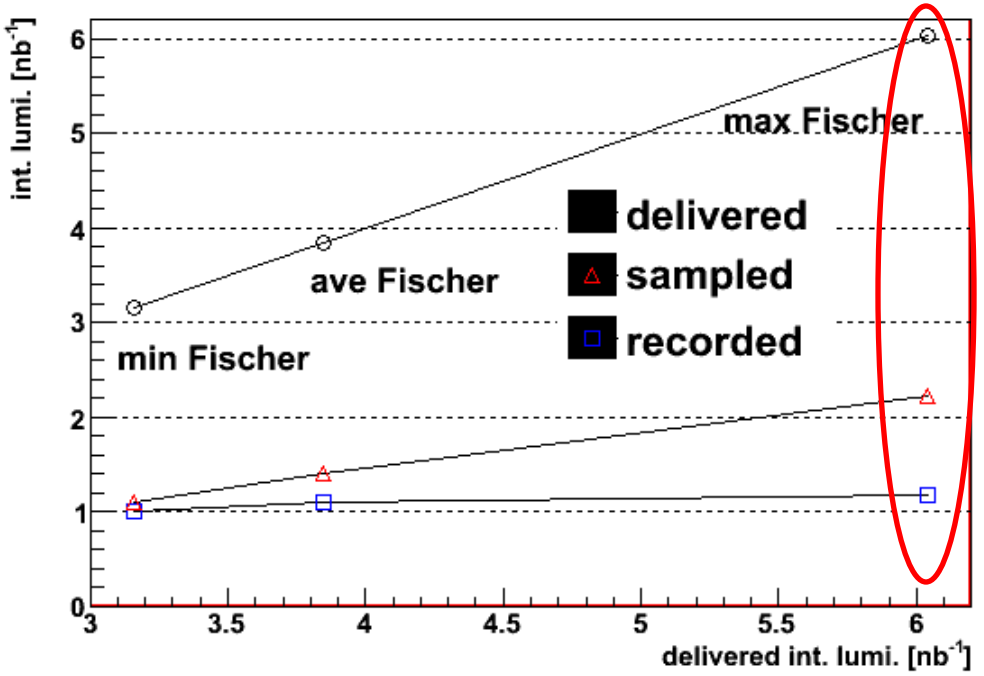
- 6 week linear ramp up
  - Longitudinal cooling only
  - peak luminosity from 5e26 to 20e26
- Integrated luminosity after 10 weeks:
  - 2.4 delivered
  - 0.84 sampled (from vtx cut*PHENIX uptime)
  - 0.82 recorded (from DAQ 5 kHz limit and store time dependence)



Maximum Scenario

- 4+4 weeks linear ramp –up
  - First 4 weeks
    - peak luminosity from 6.75e26 to 27e26
    - Longitudinal cooling only
  - Second 4 weeks:
    - peak luminosity from 27e26 to 44e26
    - Linear transition from longitudinal to longitudinal+vertical cooling

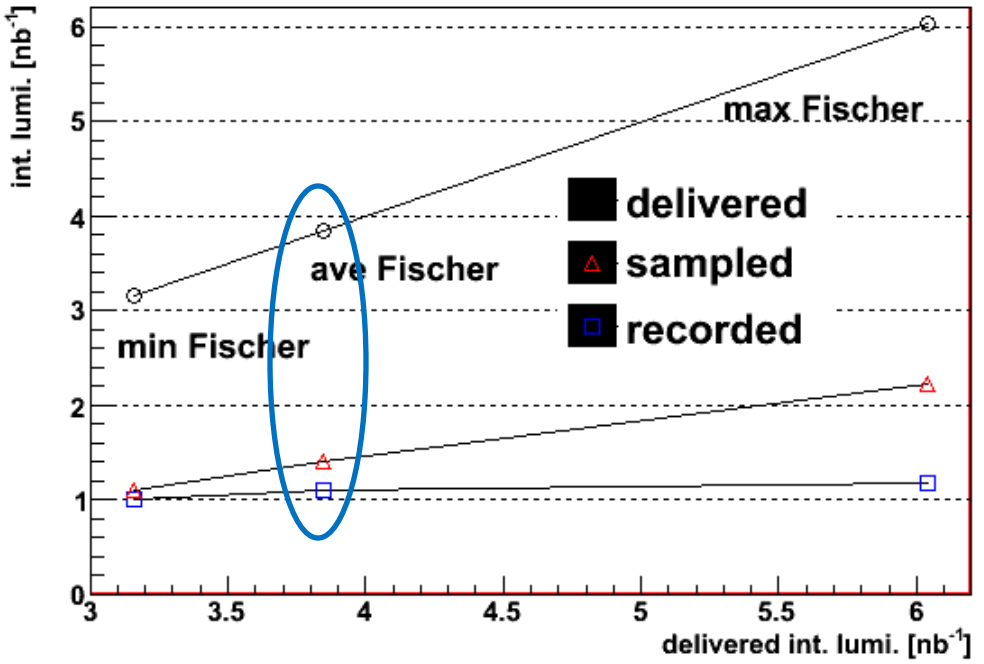
- Integrated luminosity after 10 weeks:
  - 6.04 delivered
  - 2.23 sampled (from vtx cut*PHENIX uptime)
  - 1.18 recorded (from DAQ 5 kHz limit and store time dependence)
  - maximum possible gain using Lvl1 triggers: 1.90



Average Scenario

- 4+4 weeks linear ramp –up
  - First 4 weeks
    - peak luminosity from 5e26 to 23e26
    - Longitudinal cooling only
  - Second 4 weeks:
    - peak luminosity from 23e26 to 25e26
    - Linear transition from longitudinal to longitudinal+vertical cooling

- Integrated luminosity after 10 weeks:
  - 3.85 delivered
  - 1.4 sampled (from vtx cut*PHENIX uptime)
  - 1.11 recorded (from DAQ 5 kHz limit and store time dependence)
  - maximum possible gain using Lvl1 triggers: 1.26



PREREQUISITES

Fischer Projections

- Fischer projections
  - "RHIC Collider Projections (FY 2010 – FY 2014), W. Fischer et al., 10/19/09"
  - Integrated luminosity in nb^-1 after nominal 10-week run
    - min: 2.3
    - max: 6.2
    - ave (geo.): 3.8
  - Ramp-up time to full luminosity:
    - min scenario: 6 weeks
    - max: scenario 8 weeks

Fischer Projections

- Fischer Projections
  - Store time dependence:
    - min (longitudinal cooling only):
      - 0.32*(0.6 h decay time)+0.68*(4.8 h decay time)
        - » Fischer e-mail to Jamie Nagle, 09/29/09
    - max (+ vertical cooling):
      - 10 h decay time
        - » my estimate from Fischer plot (same e-mail to Jamie)
  - Store length
    - 4.5 h, data taking from 0.5 h to 4.5 h
      - Optimal for longitudinal-cooling-only scenario

Fischer Projections and other Prerequisites

- Fischer projections
  - Fraction collisions in vertex cut of +-30 cm
    - 0.65 (based on b*=0.6, previously 0.55)
  - RHIC uptime
    - 0.55
  - Peak luminosity
    - 44e26/cm^2/s
      - “after a sufficiently long running period”
    - Initially: 25% of max
- Other prerequisites
  - PHENIX uptime:
    - 0.6 (based on previous experience)