Brookhaven National Laboratory

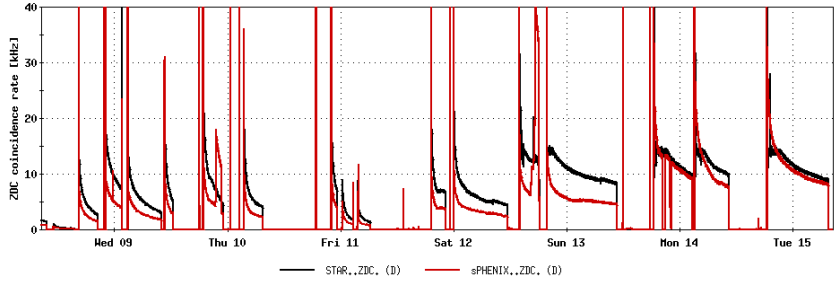
U.S. DEPARTMENT OF ENERGY

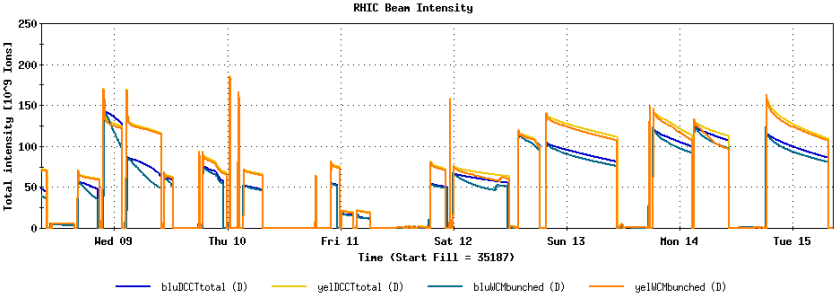
# RHIC Status

Kiel Hock

@BrookhavenLab

# Last Week at RHIC



# RHIC Status

- 111x111 physics running since 10/7
- STAR at 945 M minbias events. Goal is 1-2 B events.
- Various bunch configurations for sPHENIX detector commissioning (1x1, 6x6, 12x12, 56x56, 111x111)
- Vertical and longitudinal cooling enabled in blue and yellow.
- MVTX studies with single bunches in blue and/or yellow taking place post absorber install.
  - Reported MVTX background Wednesday. Decided to go ahead with absorber install Thursday.
  - Single beam studies in yellow began Friday.
  - Showed sensitivity to beam's momentum distribution and local orbit steering (via crossing angle).
  - Optimal configuration in yellow is dR=-0.5 mm, -8 mm at yo8-dh14, and a 1 mrad crossing angle.
  - Single beam study in blue yesterday showed the optimal configuration for yellow is also supported by blue.
  - Will start increasing the number of bunches to determine how it scales with bunch number.
  - Several weekly meetings since Friday to discuss the status of studies.
- Blue injection efficiency lower than yellow, being investigated.

# Background Issues

sPHENIX

- Simulations show this can be caused by a single particle with initial trajectory along the longutidinal axis and inplane with the MVTX.
- Simulations show particles with high momentum amplitude could strike at the taper nearest the MVTX.
- Using a change in radius in the arcs in combination with a bump at yo8-th14 (incoming yellow side) the high amplitude particles. Change of angle from 2 to 1 mrad helps with distributing remaining losses.
- Need to reoptimize collisions and collimation.

Additional studies

- gap cleaning off-tune
- squeeze of *beta** at IP10
- unsqueeze of $\beta^*$ at IP8
- octupoles
- 56 MHz
- revisit use of secondary collimation
- low intensity with heavy cooling

STAR

- Au78 produced at sPHENIX gets deposited at STAR
- Likely will be helped with the radius change. Can look to install a bump exiting sPHENIX to see if it improves.