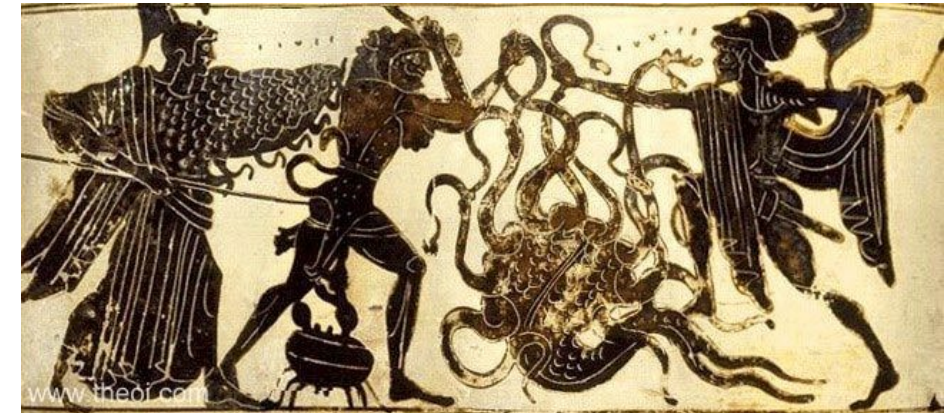


# RHIC Run 22 Startup Status

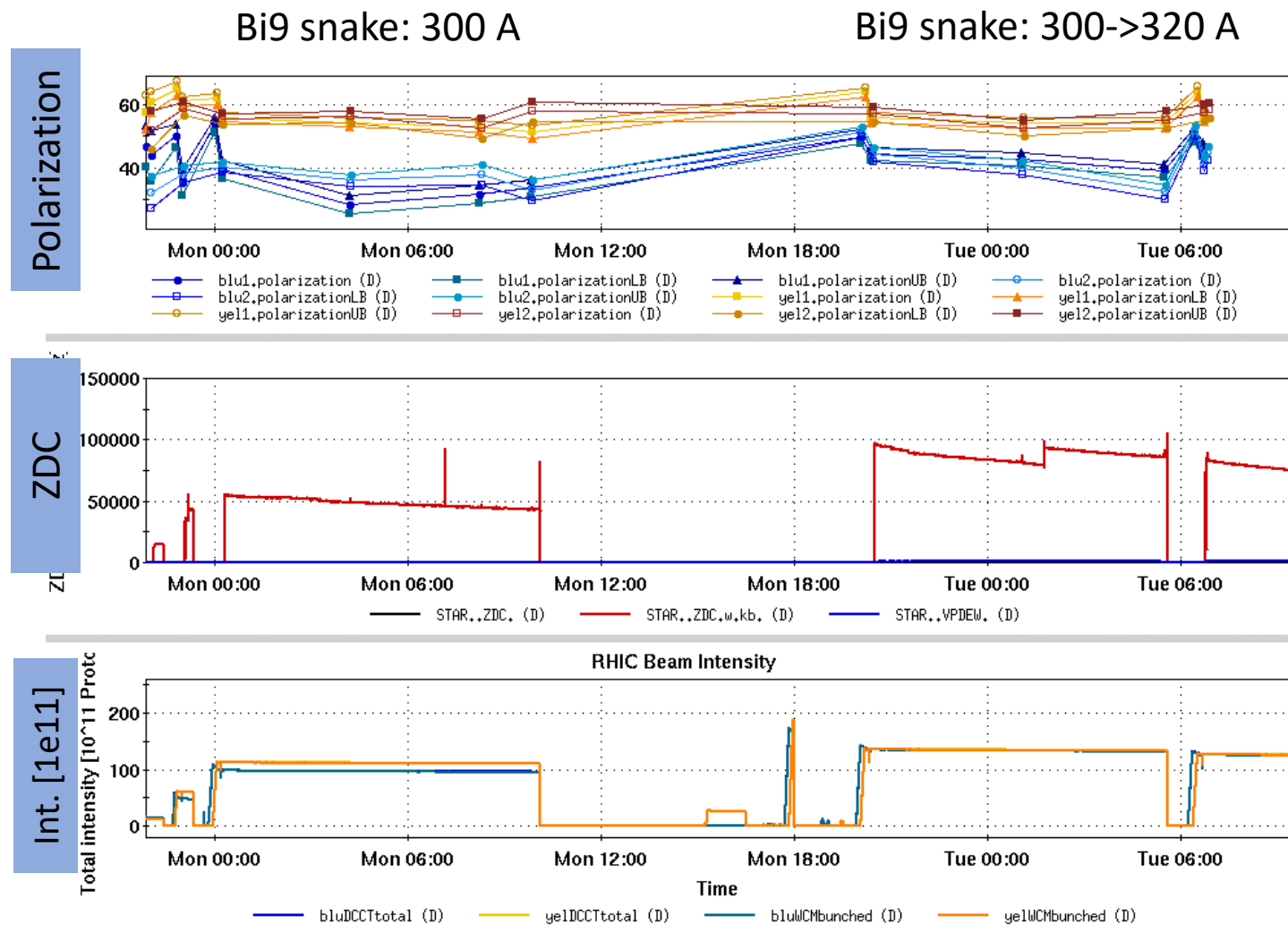
12/21/2021

- Operating with two damaged coils in bi9 snake
  - Second coil damaged on 12/12 (just prior to last time meeting)
  - 12/12-12/19
    - Power supply/magnet group investigation of coil failure
    - Rewiring of power supply to remaining two coils still allows operation as a partial snake
    - Addition of UPS to both snake supply and associated controls
      - Huge effort done safely and quickly.
    - High current shutoffs did not find any problems with remaining coils
    - Beam operation during this time: get to physics intensity levels *without* the blue snakes, ensure stable beam (higher than normal tune spreads).
  - 12/19: Recommission with partial snake
    - ~4 hours to return to previously established store conditions, now with snake
  - 12/20, just beginning regular stores



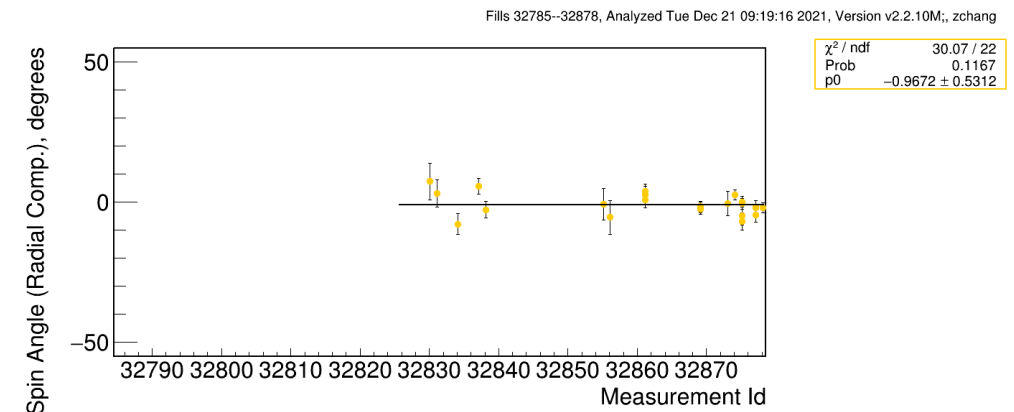
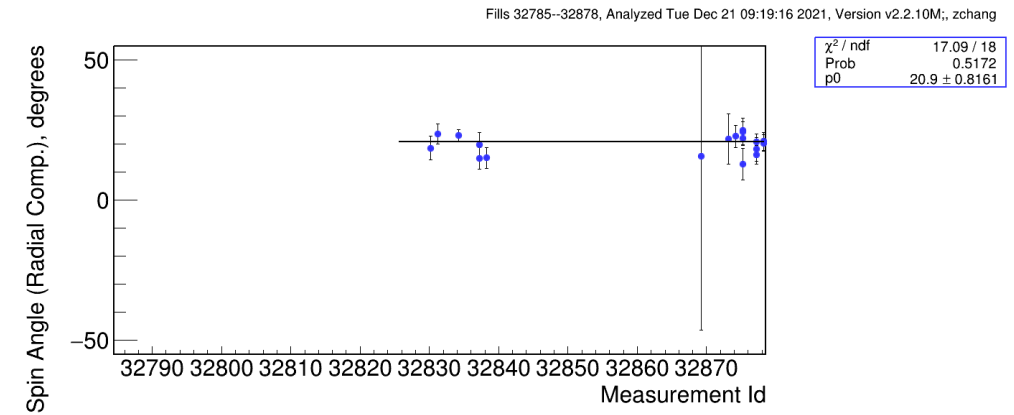
# Collider performance with partial snake

- Run 17 full store avg polarization: 55%
  - Yellow very close to Run 17: ~55%
  - Blue: ~42% (pC full store average)
- Partial snake causes
  - Polarization Loss on injection into RHIC
  - Lower polarization ramp transmission
  - Store spin tilt and decay
- Some improvement in ramp transmission ramping the partial snake to 320 A *during acceleration*.
  - Higher current is overly lossy at injection energy



# Plans for polarization improvements

- Injection loss: modify rotation in 3 o'clock snake to compensate
  - Higher current in the 9 o'clock snake also works, but increases losses on snake
- Ramp transmission
  - Orbit manipulations to counter snake imperfection
    - mechanics still to be worked out
    - In the plan for both rings for Run 22 prior to the helix damage
- Store spin tilt/decay
  - Measured  $\sim 20$  deg tilt at pC polarimeter
  - Possible global orbit manipulation to correct
    - Uses imperfection resonance to rotate spin back
  - Possibly use rotators to measure and correct longitudinal component at IP6



# Other outstanding setup items

- Luminosity still only up to 30% of required
  - Discrepancy between expectation from Run 17 and what we measure (factor of 2 lower now, accounting for lower intensity)
    - Large emittance?
    - Vernier scan today or tomorrow.
- Split/merge injector scheme
  - Still needs some improvement in extracted bunch length to enable stable transfer to RHIC.

The screenshot displays the RemoteScope software interface, which is used for configuring and monitoring the accelerator. The interface is divided into several sections:

- Setup:** A table listing various scopes and their associated users and session start times.
- Signals:** A section for configuring the input signals for each channel.
- Trigger:** A section for setting the trigger machine, start time, clock, and delay.
- PPM Users:** A list of users for the PPM (Pulse Position Modulation) system.
- Cycles:** A list of cycles for the PPM system.
- Waveform Plot:** A large plot area showing a complex waveform in yellow, representing the signal being monitored. The plot is titled "LeCroy WR104MXI-A".
- Settings:** A section at the bottom right of the plot area showing various settings such as Timebase, Trigger, Seq, and Edge.
- Status Bar:** A section at the bottom of the window showing the current status and any messages.

The status bar at the bottom of the window displays the following messages:

```
Attempting to connect axi.g5.wcm(2) to channel 1 on scope MCR_FAST_08...
Channel 1 on scope MCR_FAST_08 successfully set to signal axi.g5.wcm(2).
Setup file /operations/app_store/ElogServer/tmpFiles/RemoteScope.1638911096.113246591 successfully saved.
Menu Selection: Trigger -> Auxiliary Triggers...
```