

RHIC Run 22 Startup Status

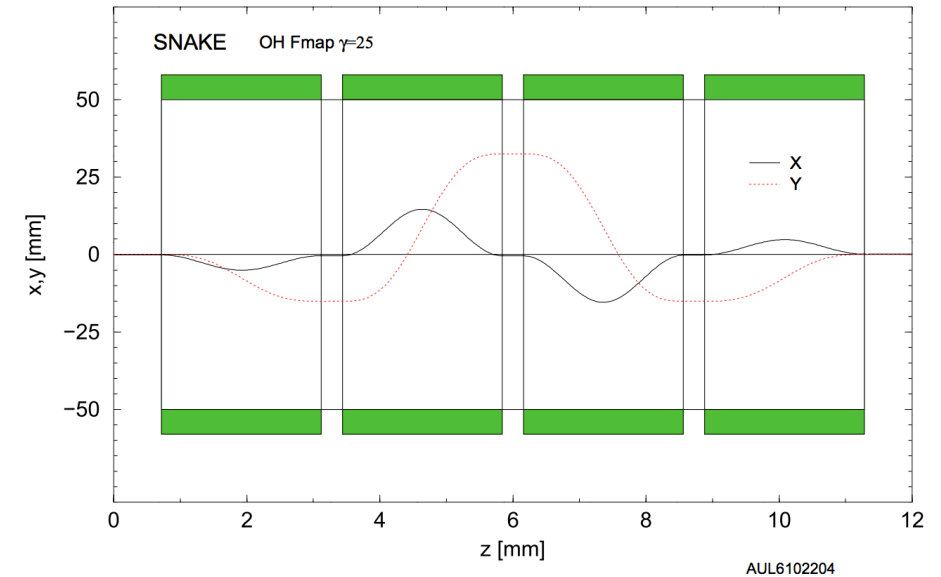
12/14/2021

- RHIC beam startup
 - Since the 12/3 power outage
 - Damaged coils #2 of 4
 - Used #1 and #4 as a partial snake
 - Parameter scans to improve polarization: partial snake current, tune scan
 - 28x28 bunch ramps, $1.2e11$ (need $2e11$ for physics)
 - **Blue polarization at 255 GeV: ~52%**
 - **Yellow polarization at 255 GeV: ~56%**
 - (Very few measurements, low intensity, not enough beam at store for Jet)
 - Downtime from overheated quench switch (two lost stores, main QLIs)
 - Power dip 12/12 2100
 - Damaged coil #4 of bi9 snake (measures as 'open')
 - Misconfigured UPS at the abort kicker led to loss of beam sync signal, kick mistimed to the abort gap.



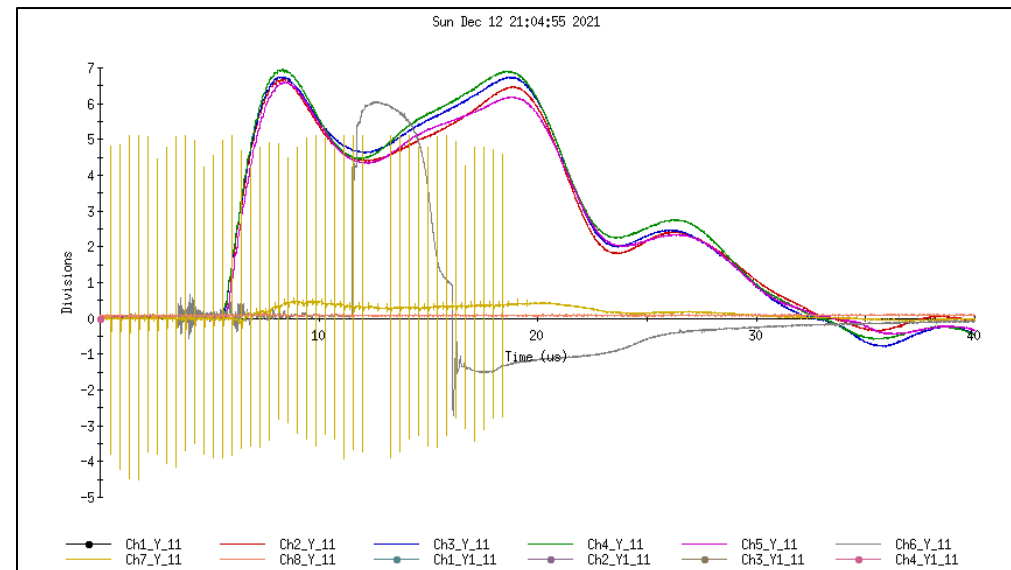
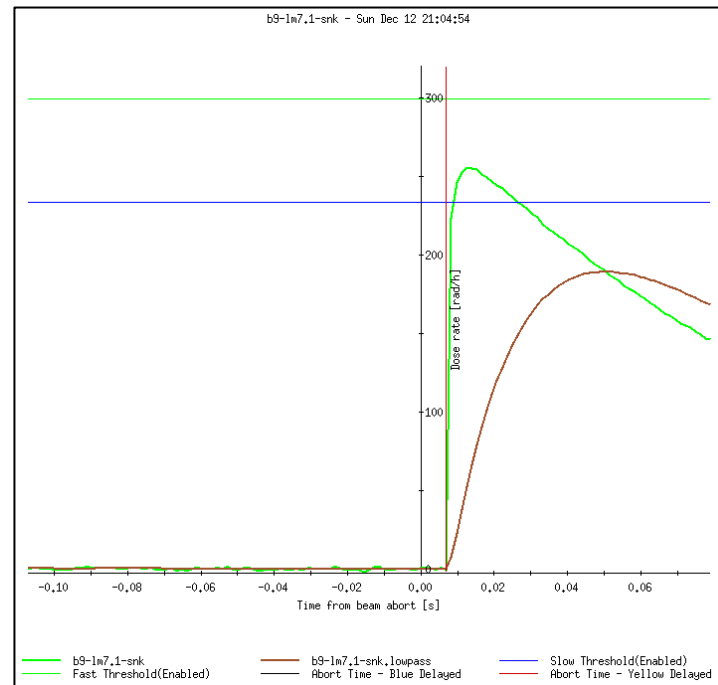
Bi9 snake coil failures

- Not clear why two coils in the same package (but wired separately) would fail now during power outage/dips
- Outer coil did not fail during the one solely beam-induced quench that happened after the 12/3 outage (not clear how much beam loss contributed to magnet trip during 12/12 power dip)
- Developing testing and beam commissioning strategies to
 1. test the remaining coil integrity early (is there a systematic problem here?)
 2. Minimize risk of beam loss on the remaining magnets
- New coil configuration (with #1 and #3) should function similar to previous (#1 and #4) configuration



Abort kicker UPS failure

- Abort kickers responded to loss of beam permit during the power dip in 'delayed' mode (correct mode)
- No loss during the 7 ms delay (MPS functions correctly to disallow unacceptable loss during the delay)
- The beam sync signal to the abort kicker had *also* lost power and was not properly on UPS (*incorrect*)
 - Without beam sync, kicker cannot fire timed to abort gap, but *will* fire.
- UPS is now properly configured to supply power to beam sync link in case of another dip



Tasks for the next few days:

- Today
 - Day: Access for CeC alignment
 - Day->Eve: Ramp development: - transfer of split/merge, intensity increase
 - Eve->Owl: Modest colliding stores for forward upgrade commissioning
- Tomorrow (Wed, Maintenance)
 - Day; Snake reconfiguration, if available
 - Day->Eve: Ramp development if time allows, return to stores for overnight
 - Eve->Owl: stores
- Thursday
 - Day: Snake reconfiguration or ramp development
 - Day-Eve: Reintroduce snakes if demonstrated stable operation at high intensity
 - Eve->Owl: stores with most stable demonstrated configuration.

Commissioning plan:
Demonstrate intensity needed for physics+~25% during development *without* blue snakes.

Introduce snake back into the lattice and walk intensity back up to 'known' stable settings