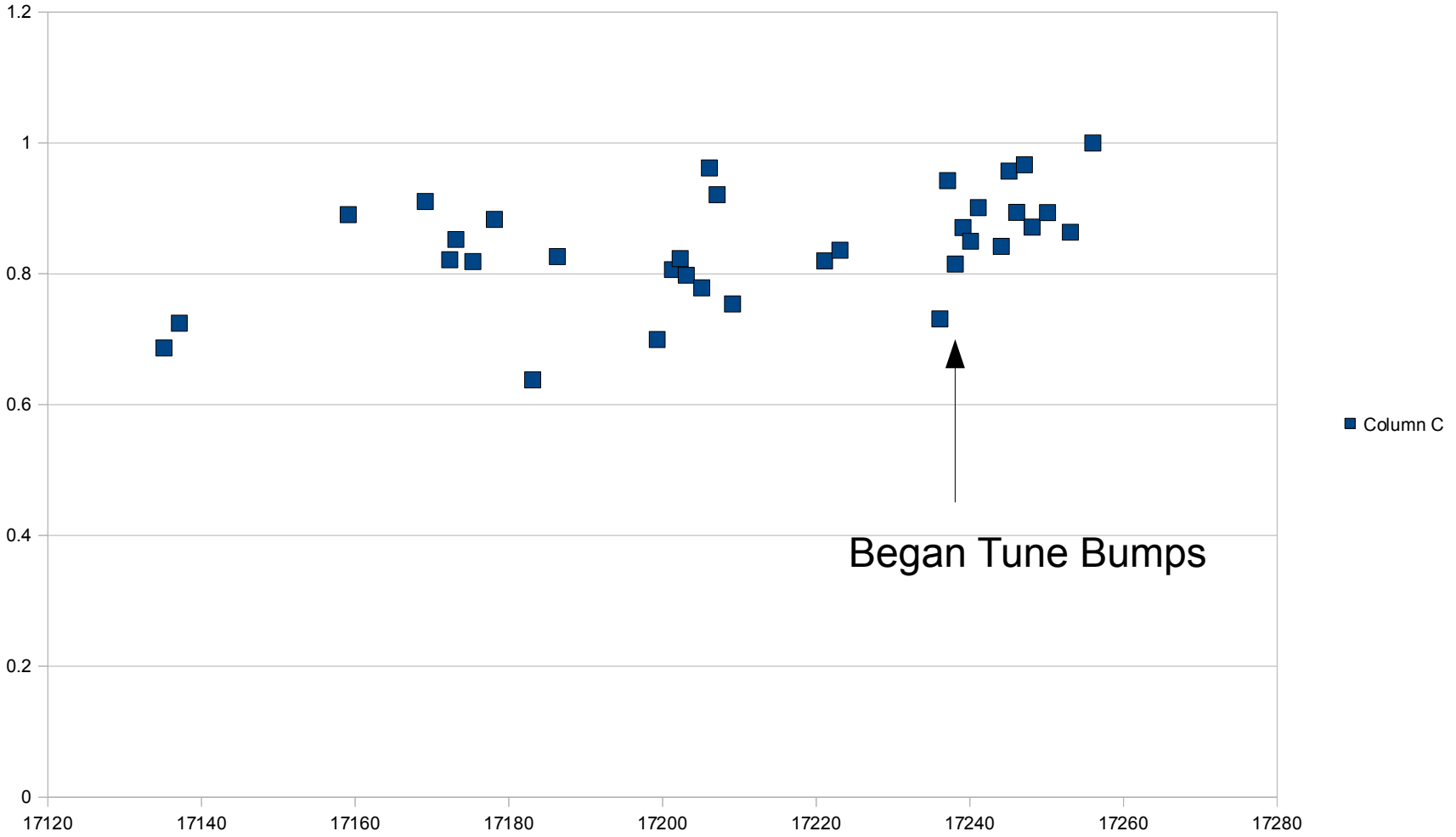
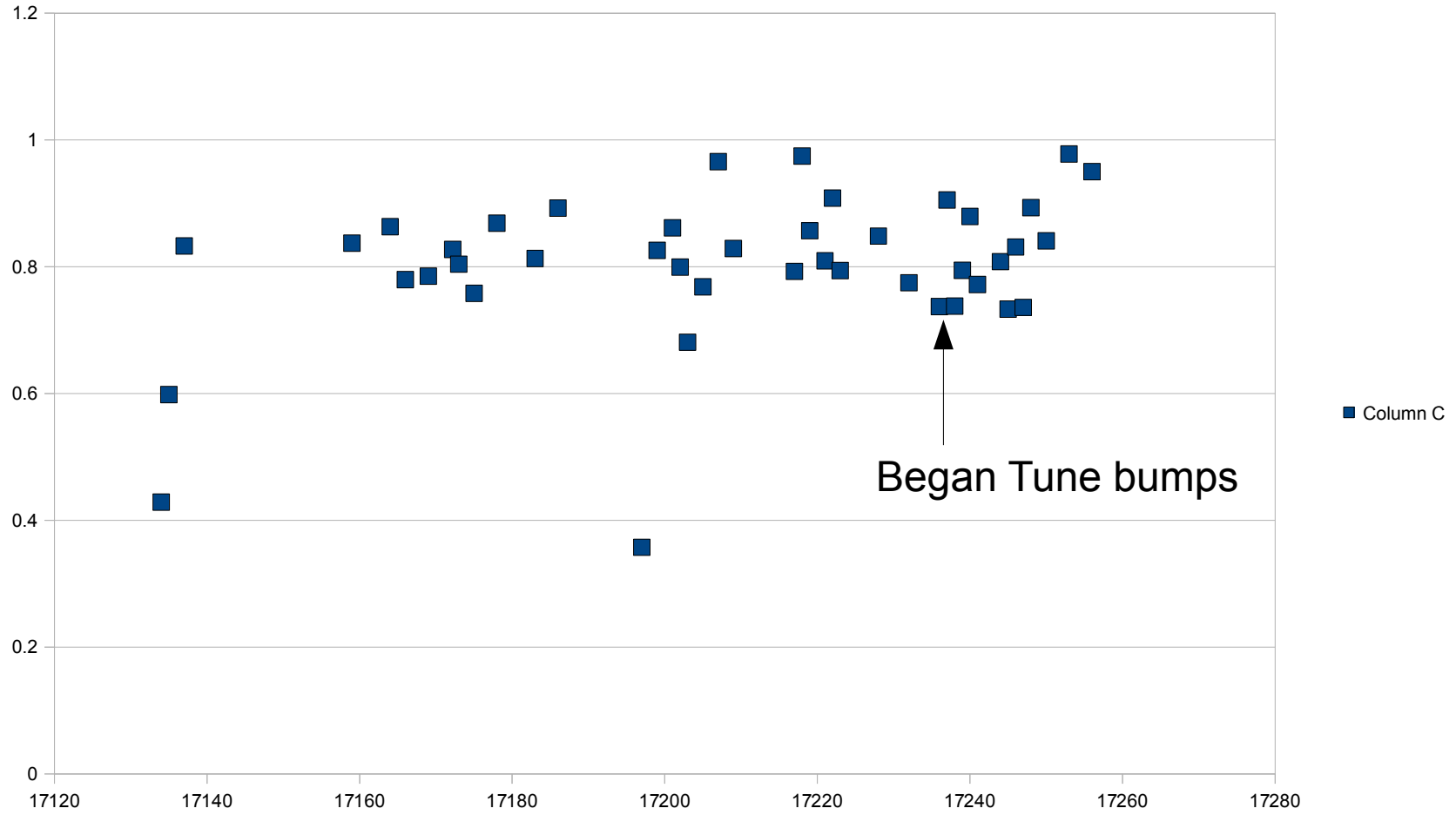
RSC Meeting March 22nd

- Polarization Progress in RHIC:
  - Ramp Efficiency:
  - Storage Ramp:
  - Lifetime:
  - Injection Lifetime:

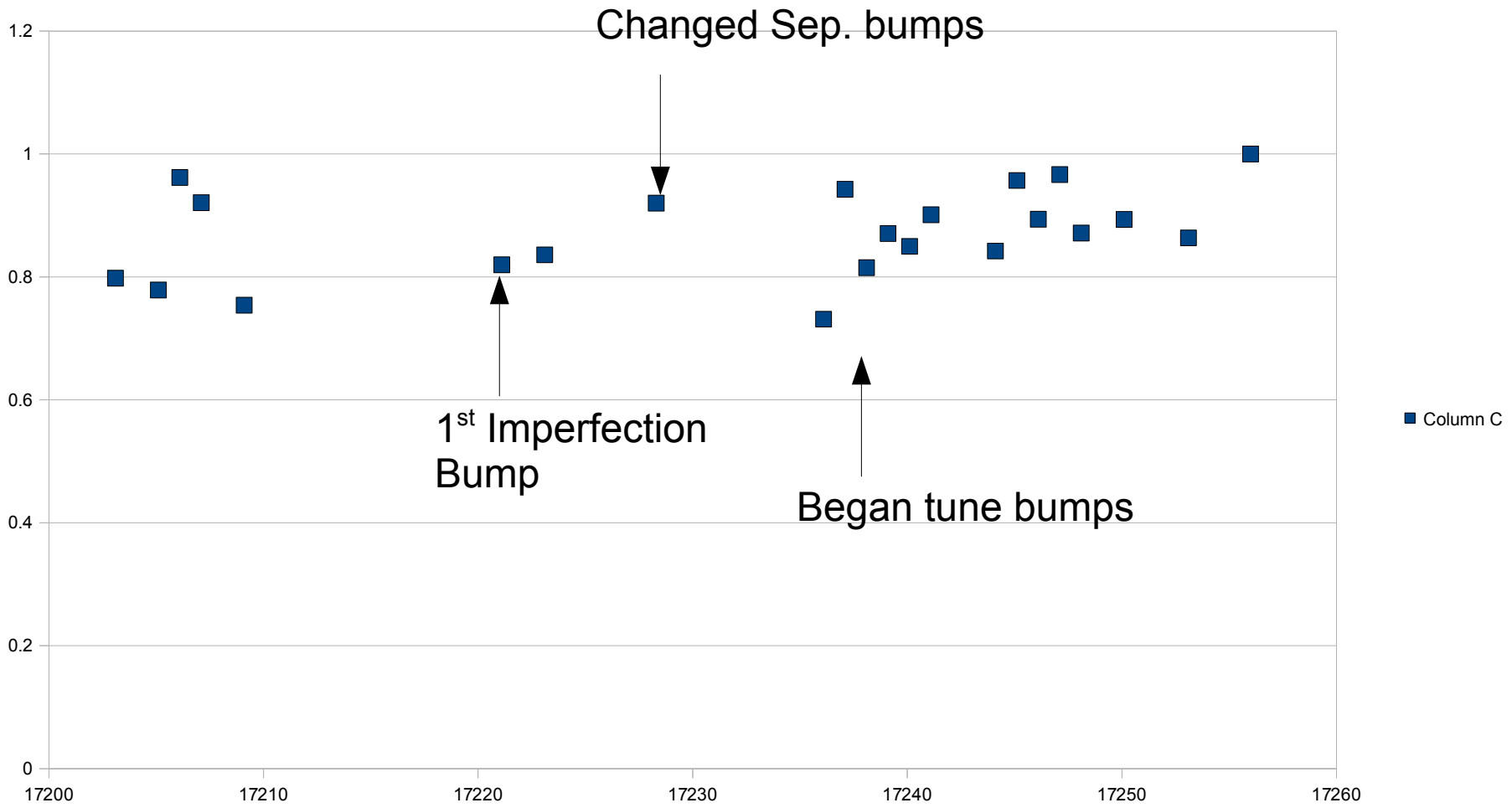
Ramp Efficiency Yellow



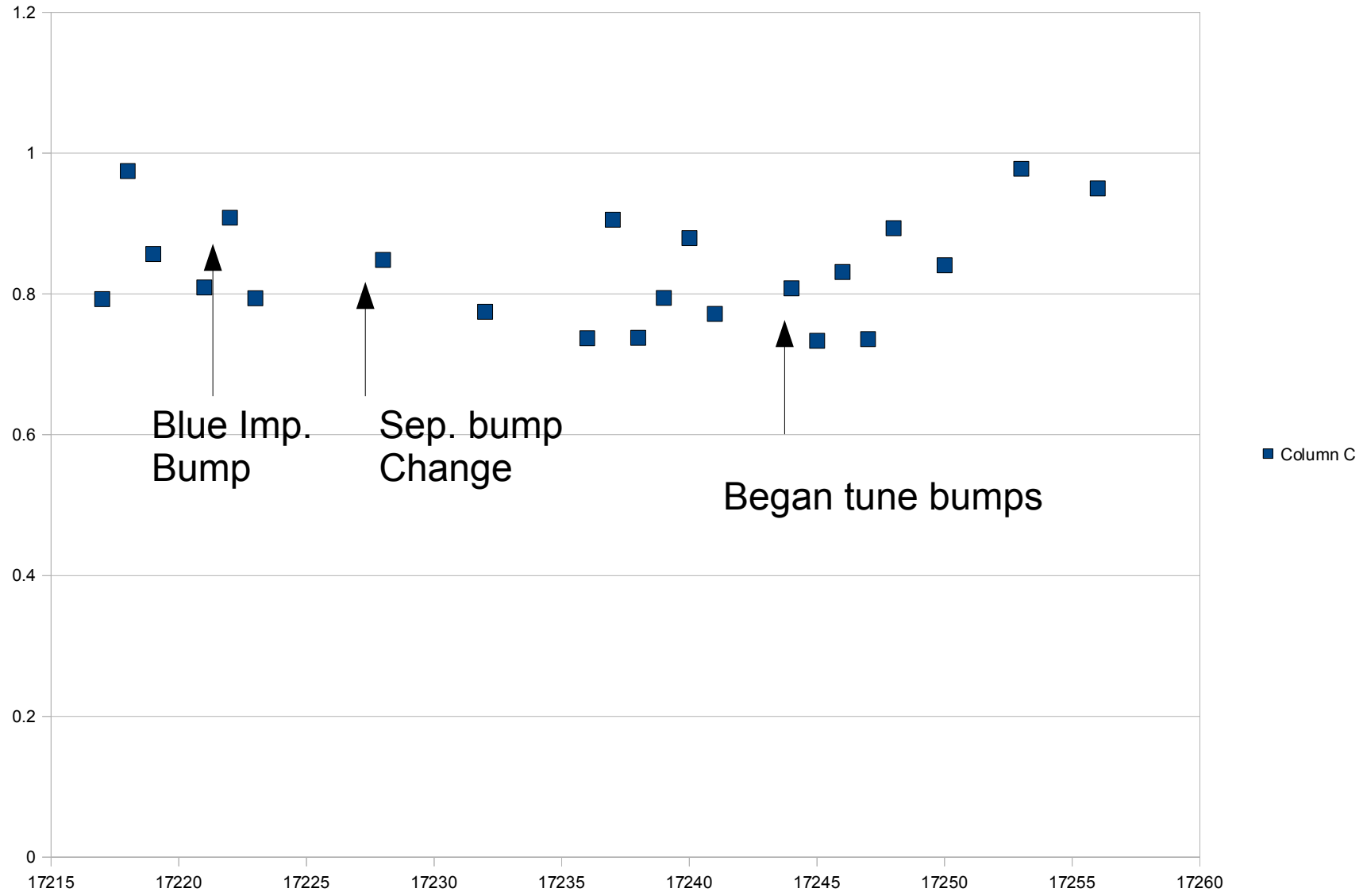
Ramp Efficiency Blue



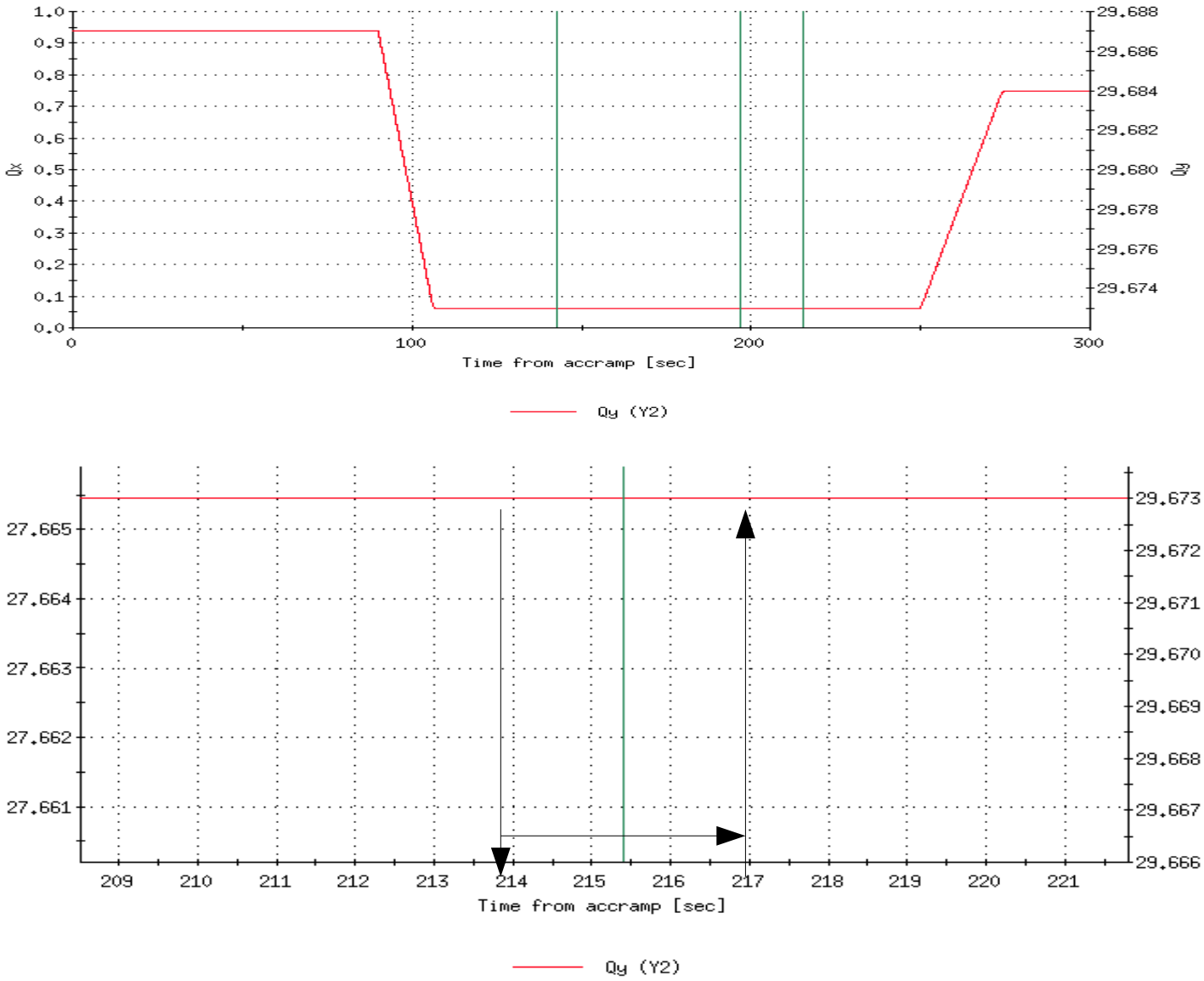
Zoom in on Yellow



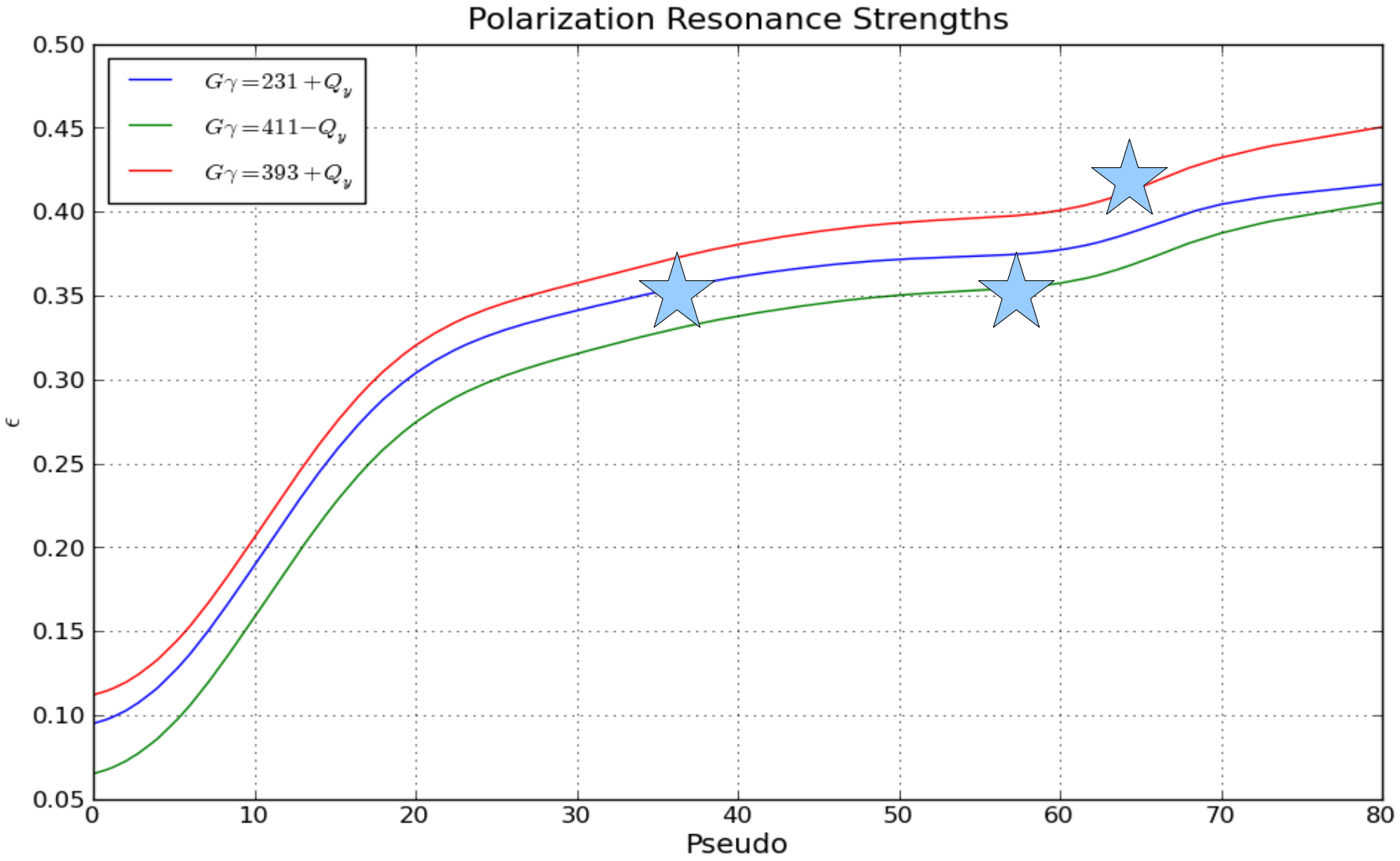
Zoom in on Blue



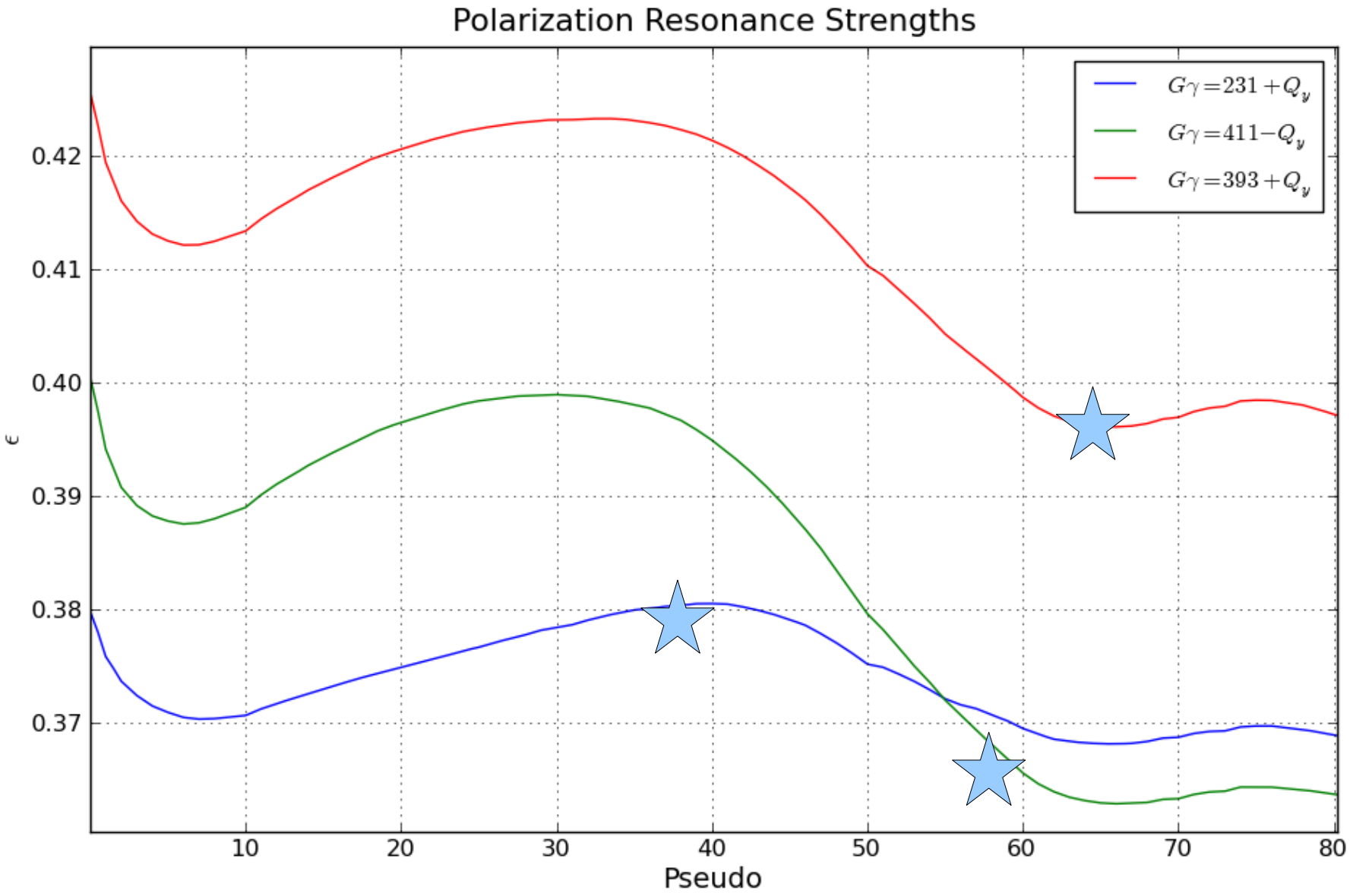
Tune Bump Construction to 2/3



Yellow E-lens Optimized Lattice



Blue E-lens Optimized Lattice



Storage Ramp Efficiency

- As a result of local nonlinear IR bump work done by Vincent had more room to live in yellow closer to 2/3 so moved Qy down to 0.68 helped losses there
  - Future: apply Global 3Qy correction at Storage Ramp make more room to go down further.
  - Fix wiggles in phase shifter settings during Ramp may make things cleaner.

Polarization Lifetime Yellow

- Was a big problem:
  - Mei fixed issue with PS mismatch between settings and read-back for yellow inner snake current.
  - There seems to be losses towards the end of the Store:
    - We think this is due to having less beam-beam effect which pushes tune down from 0.7. To compensate we should think of scheme to lower tunes slowly during store as beam decays.

Injection Lifetime and losses

- In my opinion remaining large issue
  - AGS ~ 60-65% polarization at FT
  - RHIC ~ low 50% to high 40's before acceleration ramp
    - Where is our 10-15% going to?
    - Possible causes:
      - Living to close to 0.7 at injection due to 3Qy resonance
        - Vincent applied nonlinear IR bumps at Injection: made life better Blue beam lifetime improved. Yellow we moved above 0.7 but we cross 0.7 during acc ramp and have beam losses now and not clear polarization at injection is better.
        - Apply global 3Qy correction at Injection and bring yellow back down below 0.7
      - Losses in ATR ? We know couple % difference due to ATR line between blue and yellow maybe this is worse this year due to larger emittance?
      - Maybe we are not spin matched in RHIC with AGS well?

Future prospects

- Highest priority: track down pol losses between AGS and RHIC
- Later: understand impact of phase shifter PS on Polarization ramp efficiency
- Fix Imperfection bump construction: error in our DEPOL need to correct Matlab code
- Apply GammaT quads during res. Crossing to reduce spin tune spread.