




5/4/21 RADIAL SHIFT APEX RESULTS

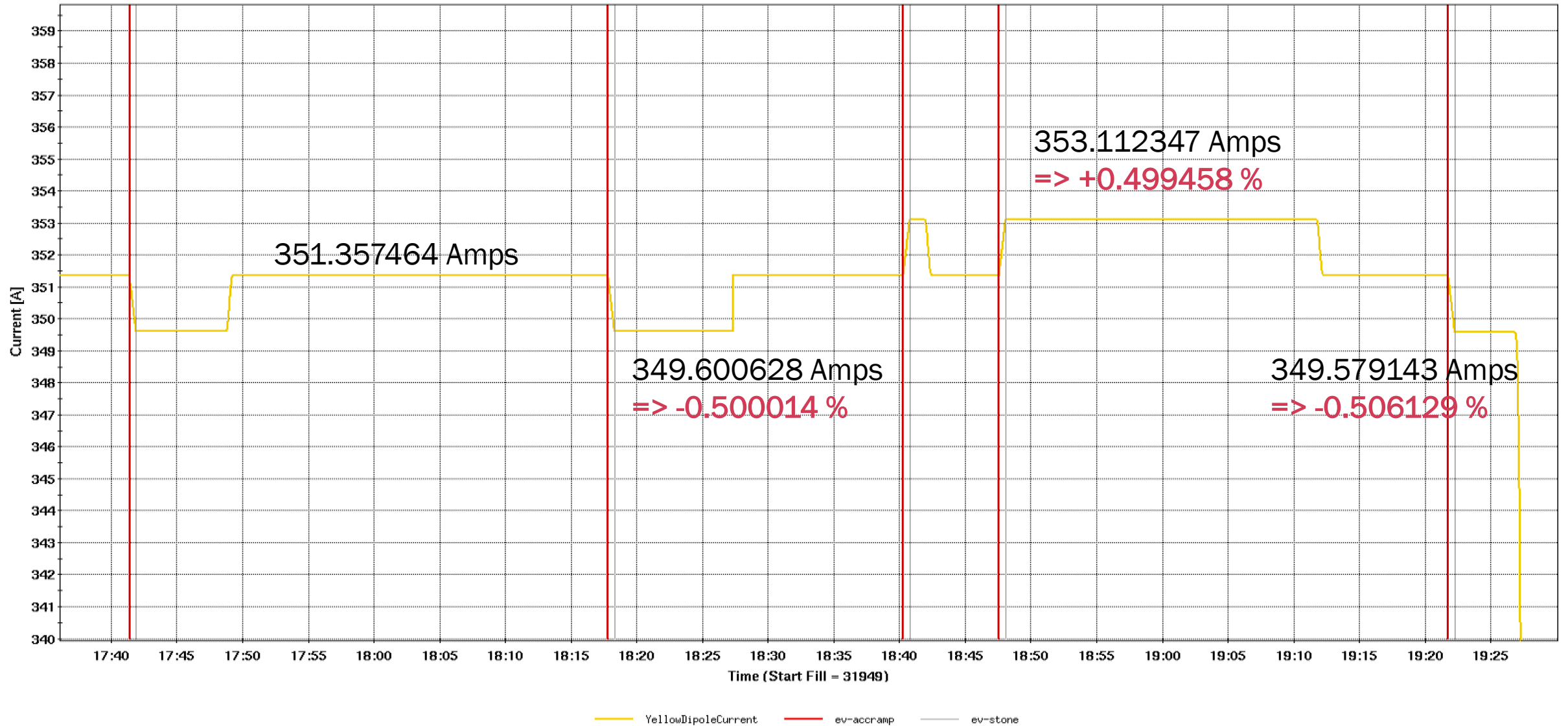
G. Robert-Demolaize for the RS Team



Setup

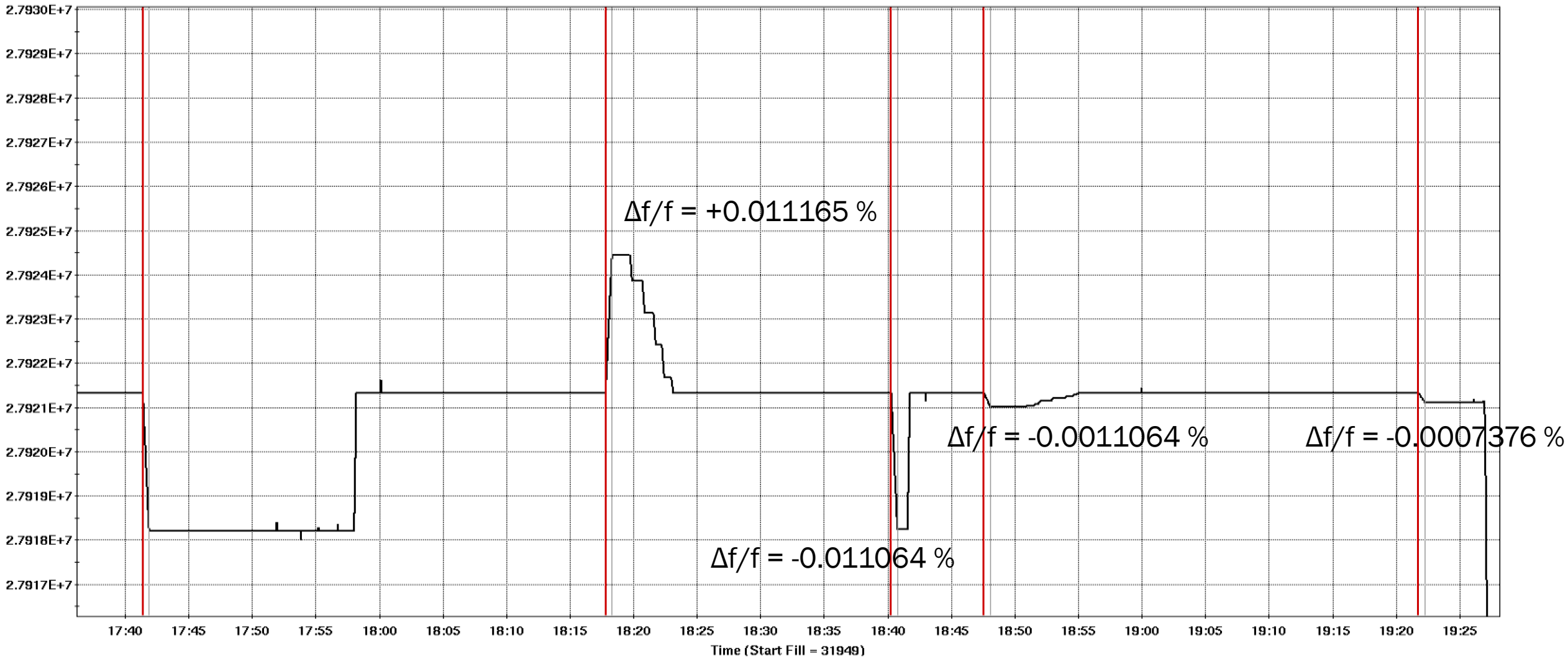
- The plan was to test 4 ramps: +/- 0.5% in the short and long straight section configurations.
- Crunched with time once decision was made to switch to Au20-7GeV-10m (wobble low energy ramp)
=> still made it in time!
- RF control was the biggest issue coming in, with questions about how to determine X_{mean} accurately.
- Ended up testing 2x short configuration and 1x long configuration, after the “reviving” process took 3h.
- Results shown next are preliminary...

Dipole field changes



Time = Tue May 4 17:38:06 2021+179166us, YellowDipoleCurrent = 351.357463760074
Time = Tue May 4 17:44:51 2021+177777us, YellowDipoleCurrent = 349.600627613142
Time = Tue May 4 18:54:45 2021+179166us, YellowDipoleCurrent = 353.112346781772

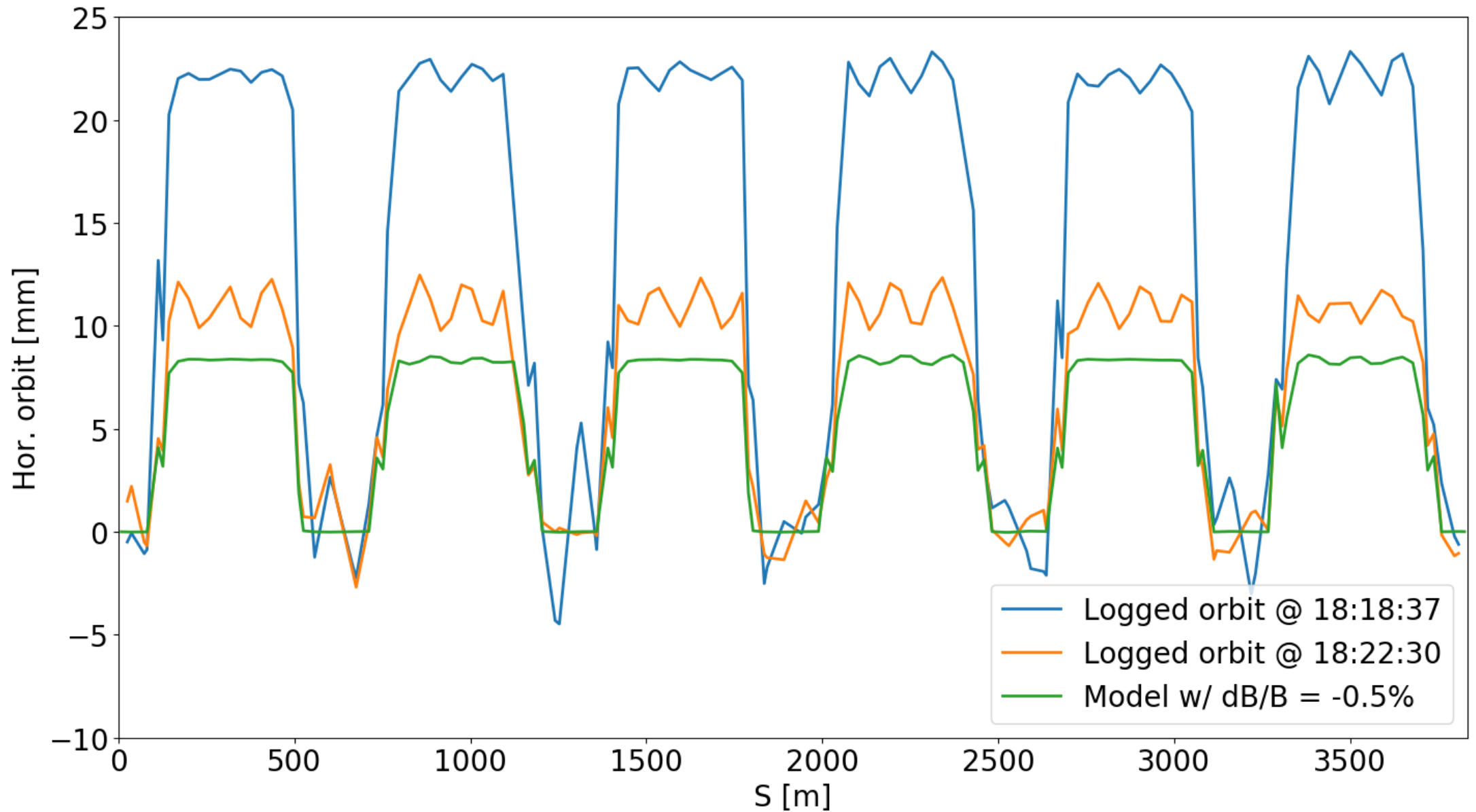
RF frequency changes



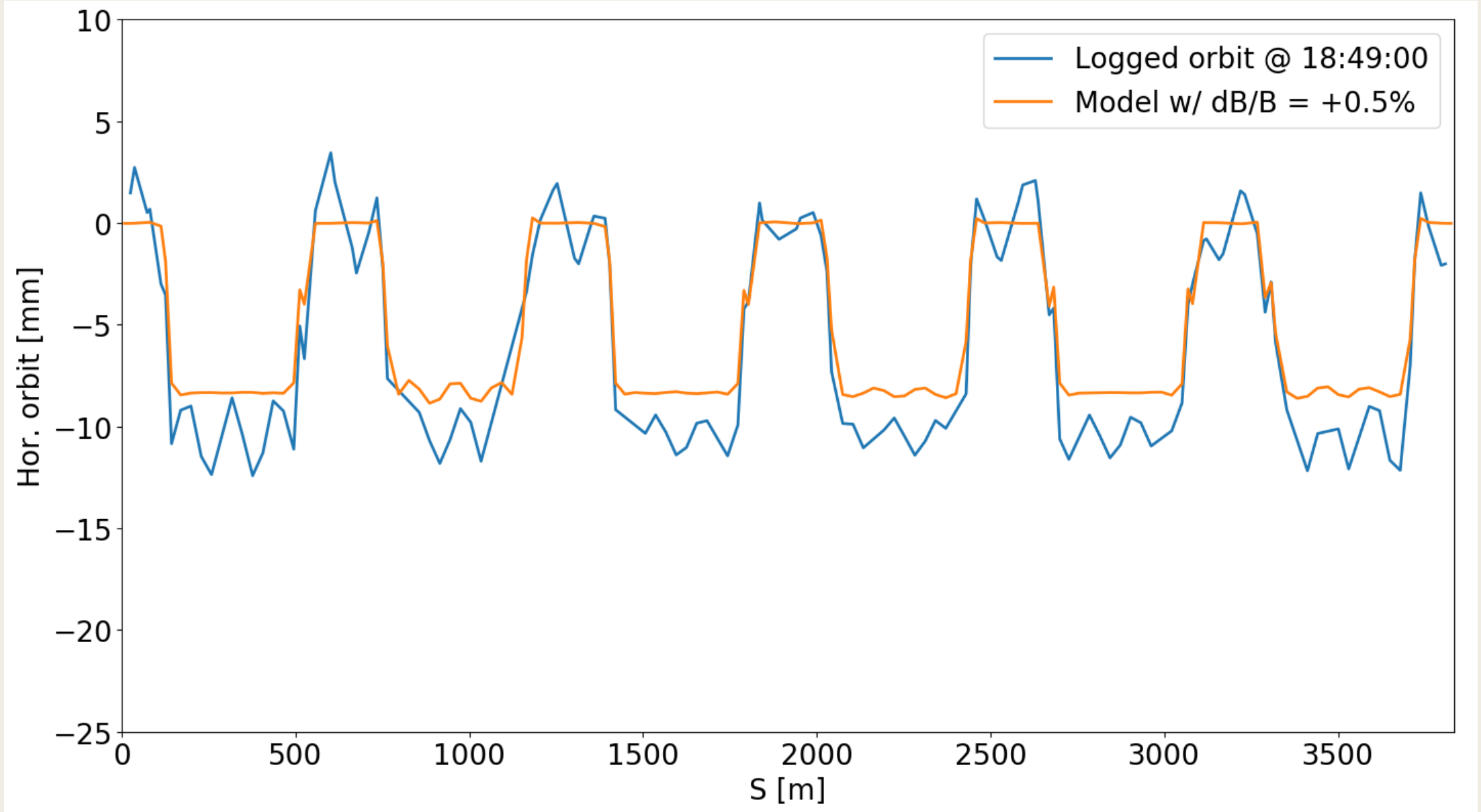
— rfuRhicDsp.4a-rf1ly1.3:freqDoubleFB28MHzM — ev-accramp — ev-stone

Time = Tue May 4 18:08:43 2021+95667us, rfuRhicDsp.4a-rf1ly1.3:freqDoubleFB28MHzM = 2.79213235444329e+07
Time = Tue May 4 18:18:59 2021+594720us, rfuRhicDsp.4a-rf1ly1.3:freqDoubleFB28MHzM = 2.79244408920929e+07
Time = Tue May 4 18:41:16 2021+470032us, rfuRhicDsp.4a-rf1ly1.3:freqDoubleFB28MHzM = 2.79182343547288e+07

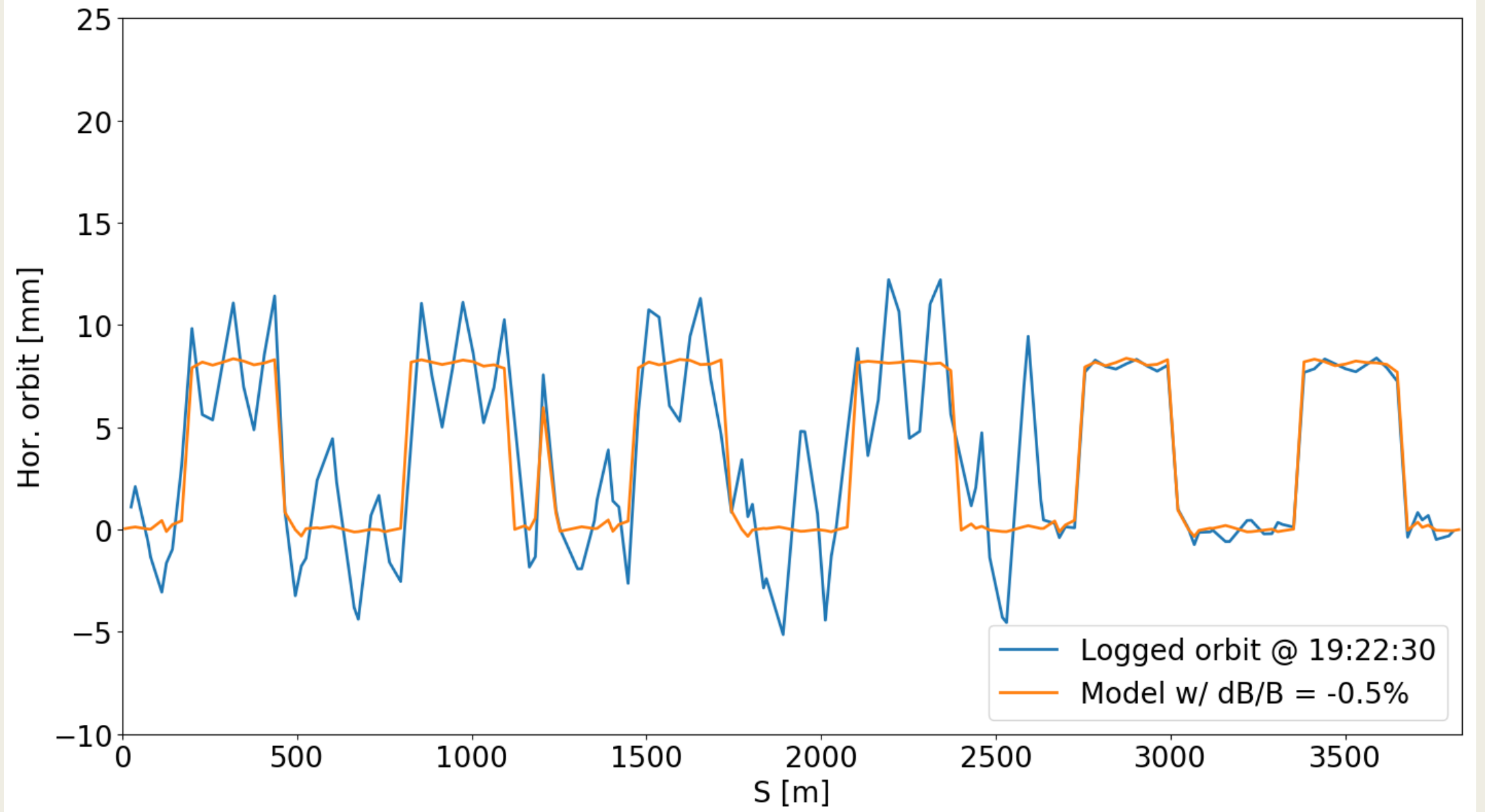
Measured orbits - RSm05



Measured orbits - RSp05



Measured orbits - RSm05long



Conclusion & Next Steps

- Very good to excellent agreement between model and measured shifted orbit. Deviations are well understood.
- Both short and long configuration were demonstrated as options for the radial shift.
- Tune feedback was used successfully; still working on scripting requirements for orbit feedback.
- RF control issue is now well understood for future attempts.
- Two requests for next APEX:
 - short term: 1-2h at 9.8 GeV injection to confirm the new calculation/procedure of RF frequency change;
=> can be done anytime!
 - long(ish) term: 6-8h at 100 GeV Au (*not* squeezed Oxygen optics) to test full configuration suite
=> right after completion of physics program?