

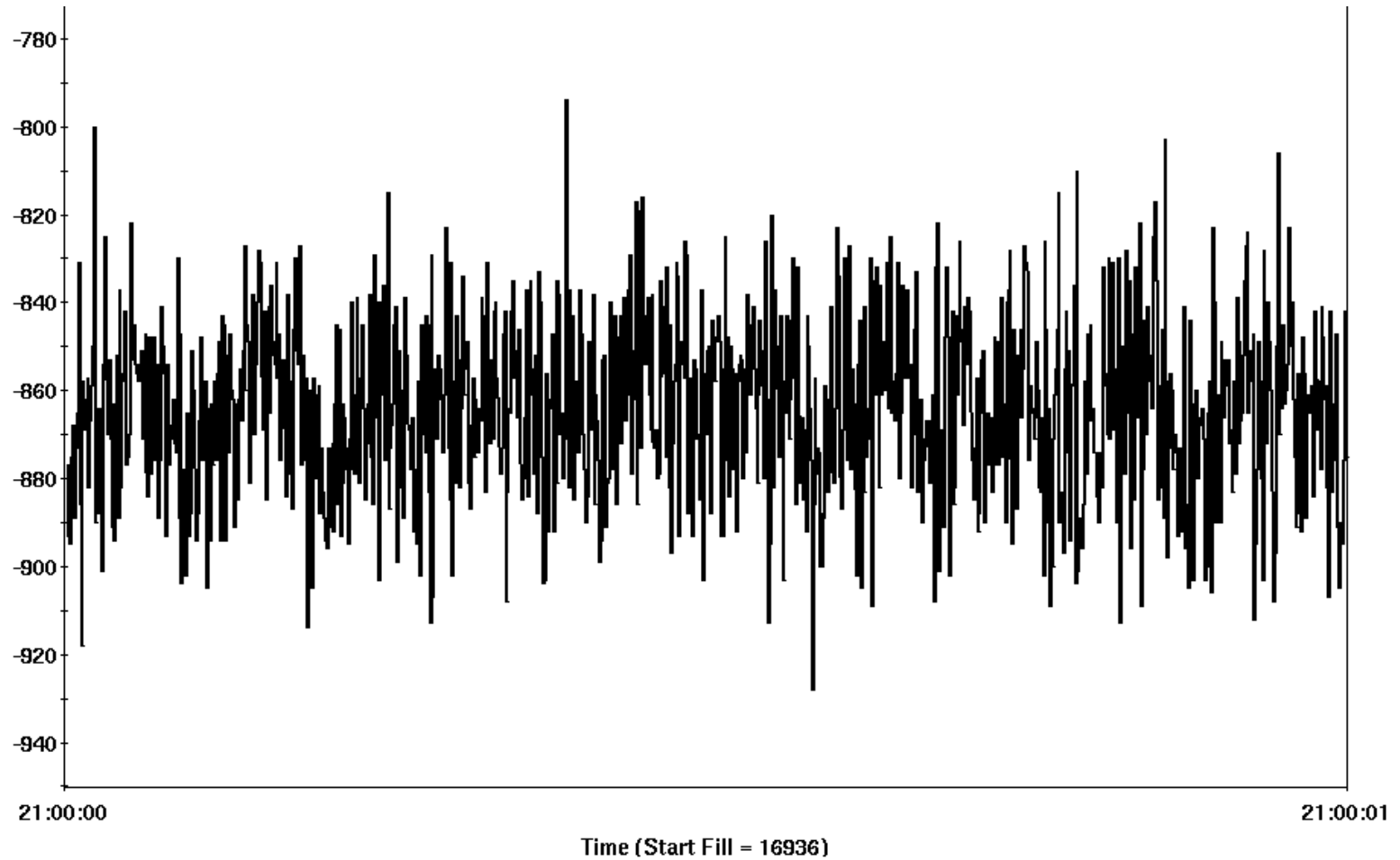
CEC POP APEX

May 30, 2012

Experiment Conditions

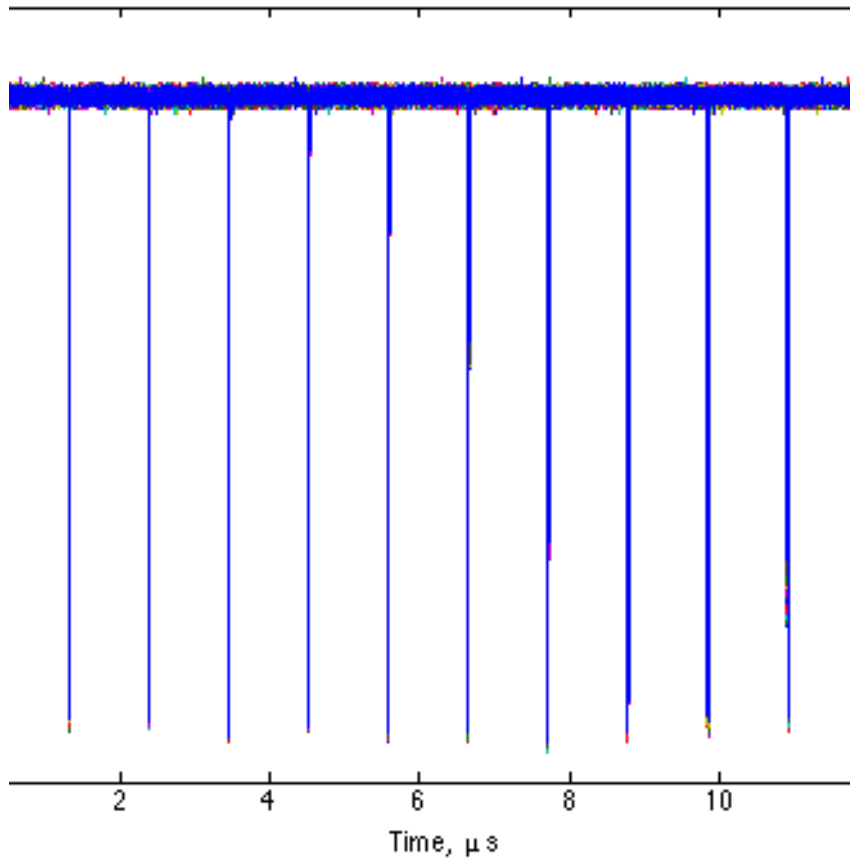
- Goal:
 - Measure beam parameters critical for CEC POP (jitter, beam spectrum, orbit stability, bunch profiles)
- Set-up
 - 100 GeV/u gold ions in the yellow ring (left after the previous session with blue ring dumped)
 - No re-bucketing, Landau cavity ramped down, no stochastic cooling
 - 10 Hz orbit feedback on
 - Utilized IP4 WCM (used for cogging observation)
 - Signal observed on LeCroy WaveRunner 640Zi

Orbit Stability

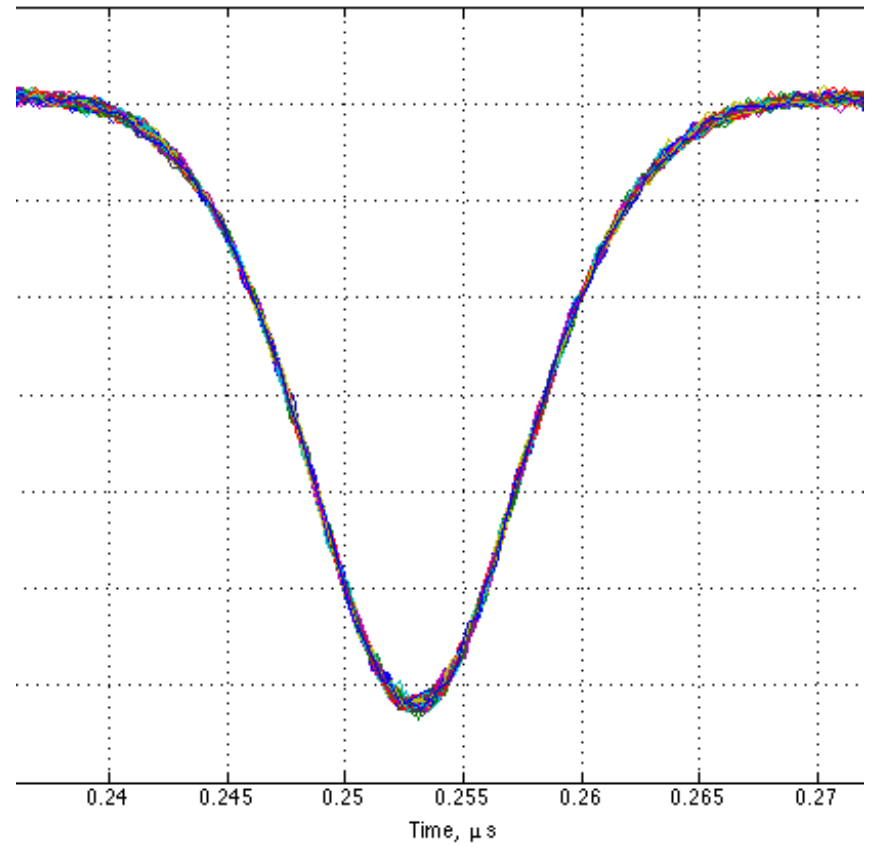


Beam Profile

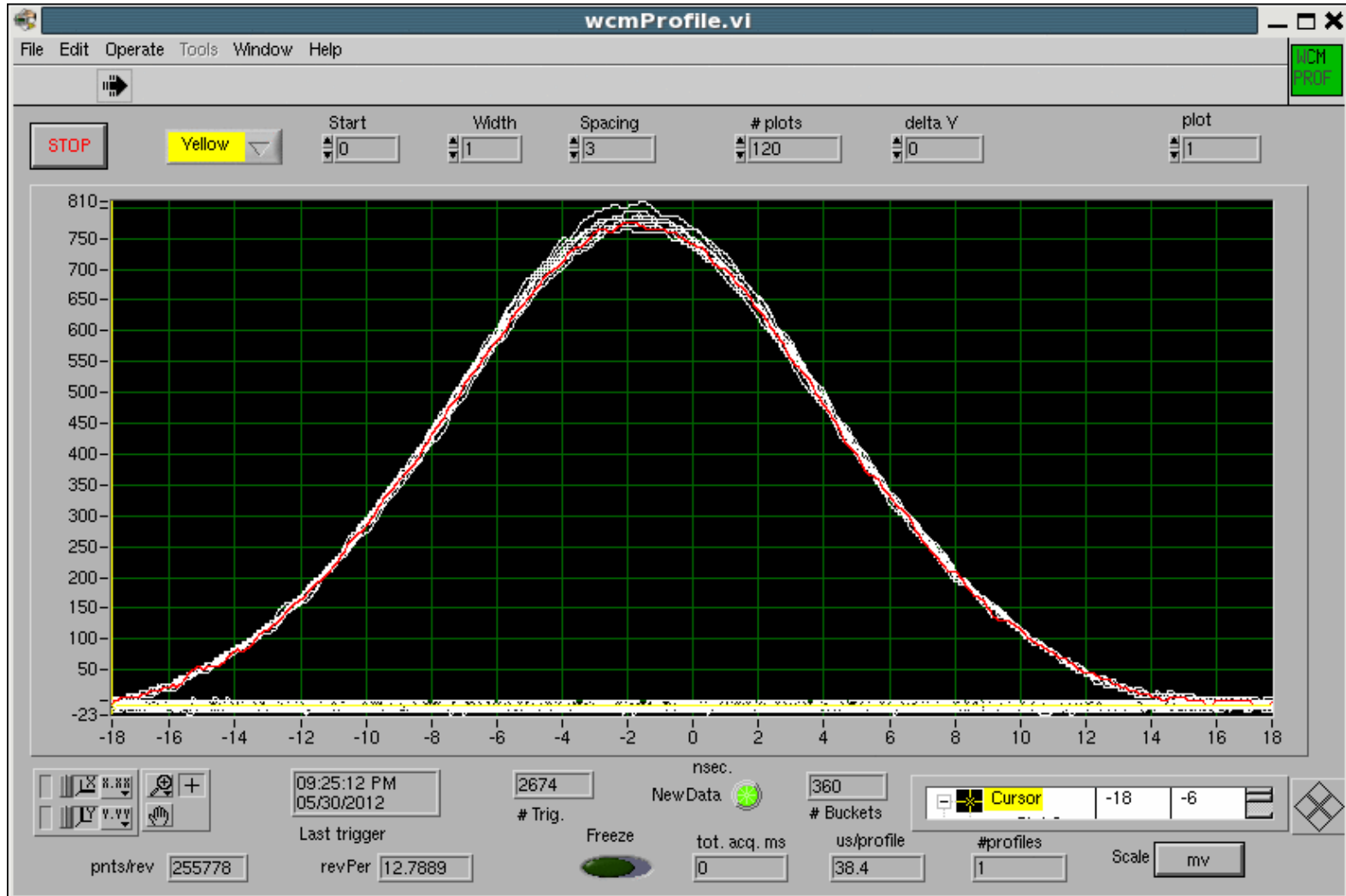
77 turns overlapped, $F_{rev} = 78.193$ KHz



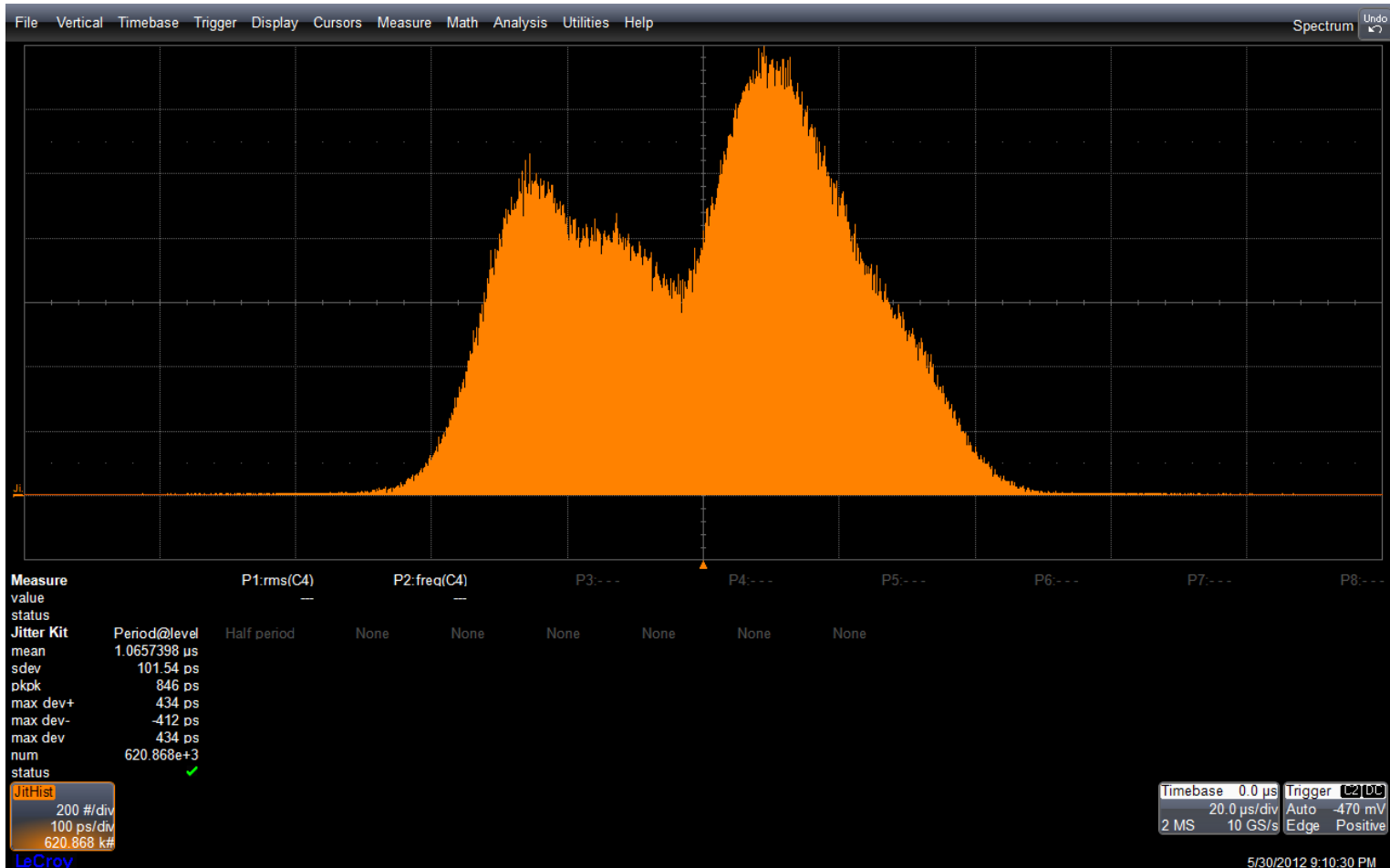
77 turns overlapped, $F_{rev} = 78.19294$ kHz, zoom first bunch



Bunch Profile from Control System

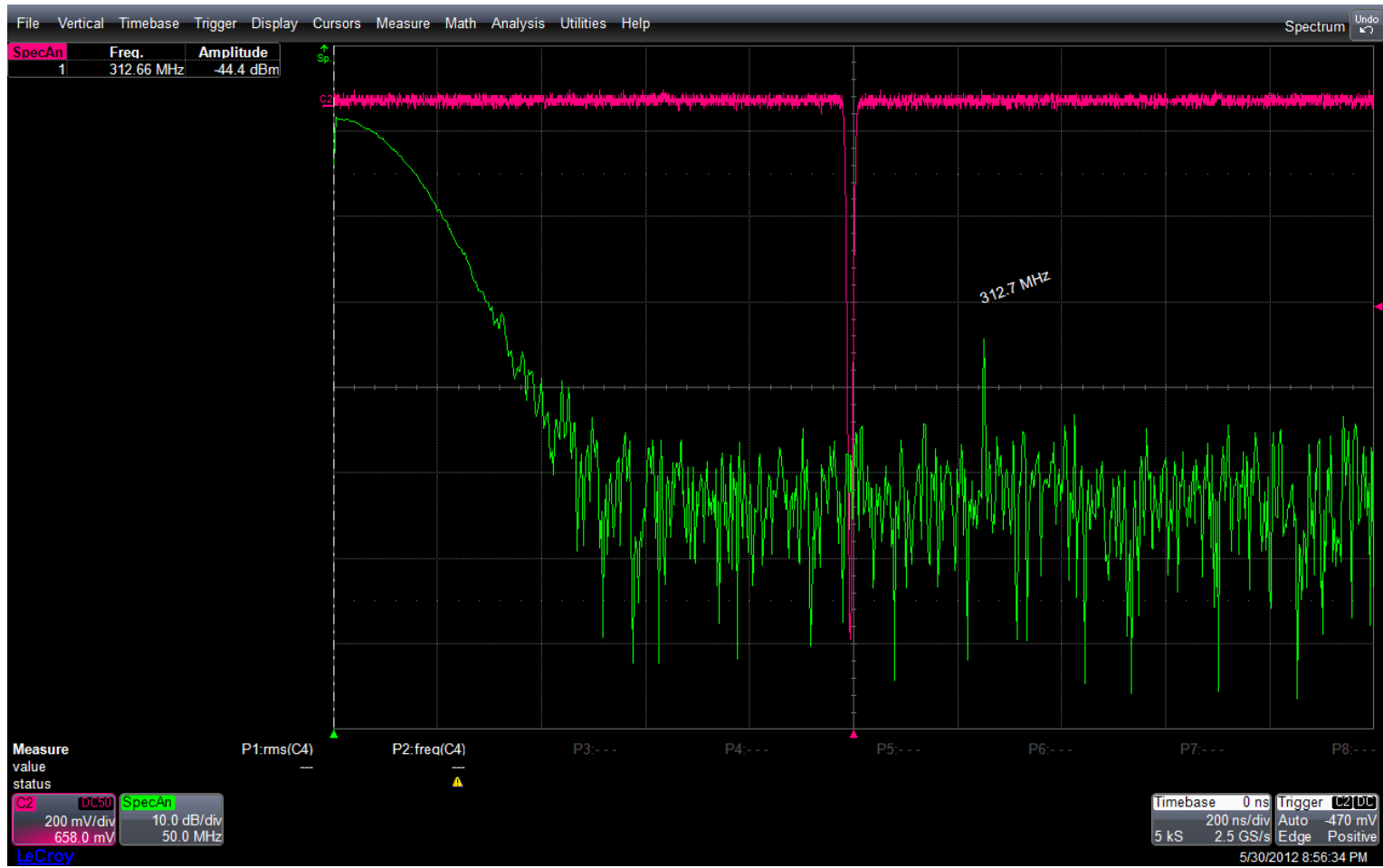


Jitter Measurement

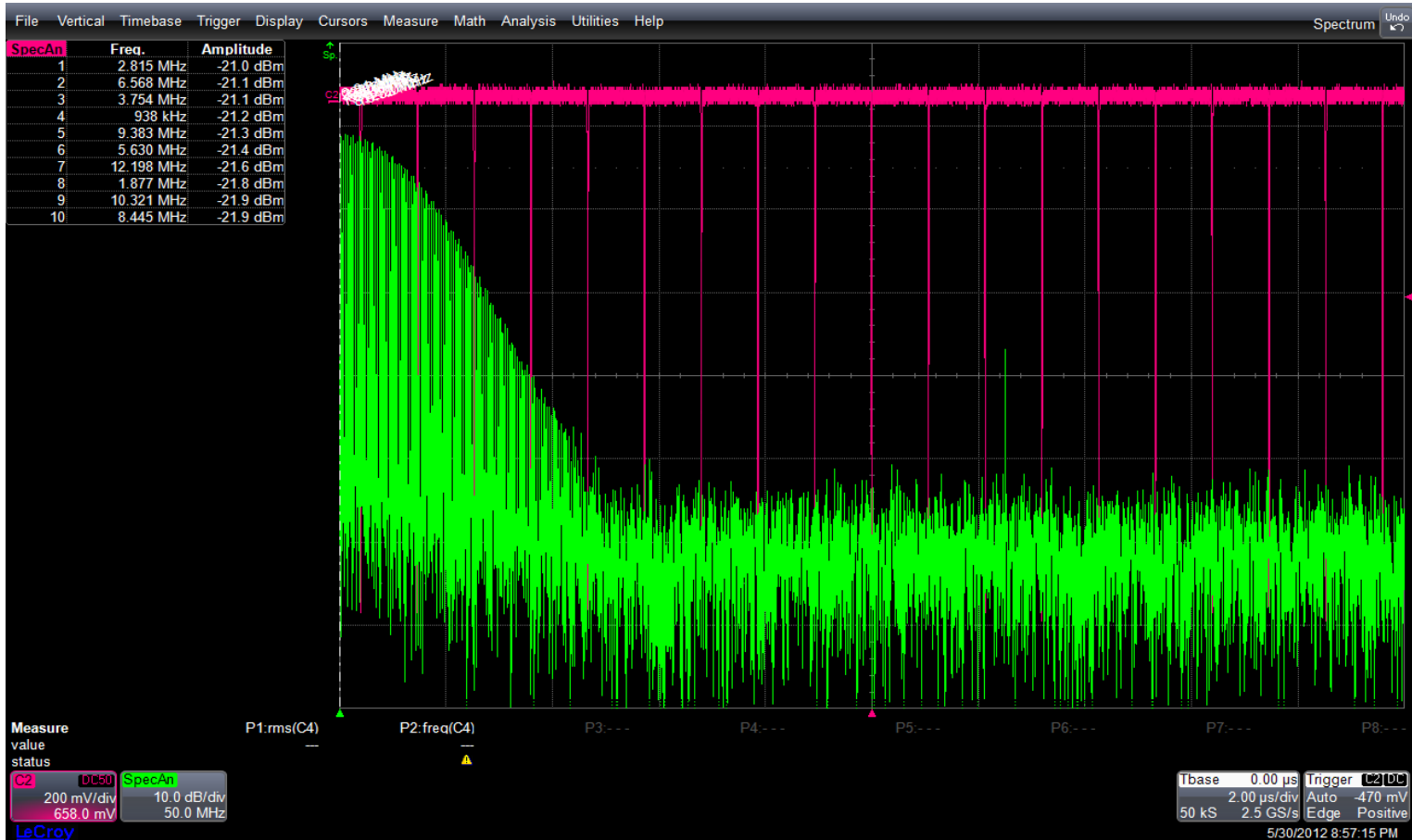


Period 1.0657398 μ s corresponding to 78.192945 kHz. FWHM is about 120 ps, r.m.s. is 50 ps

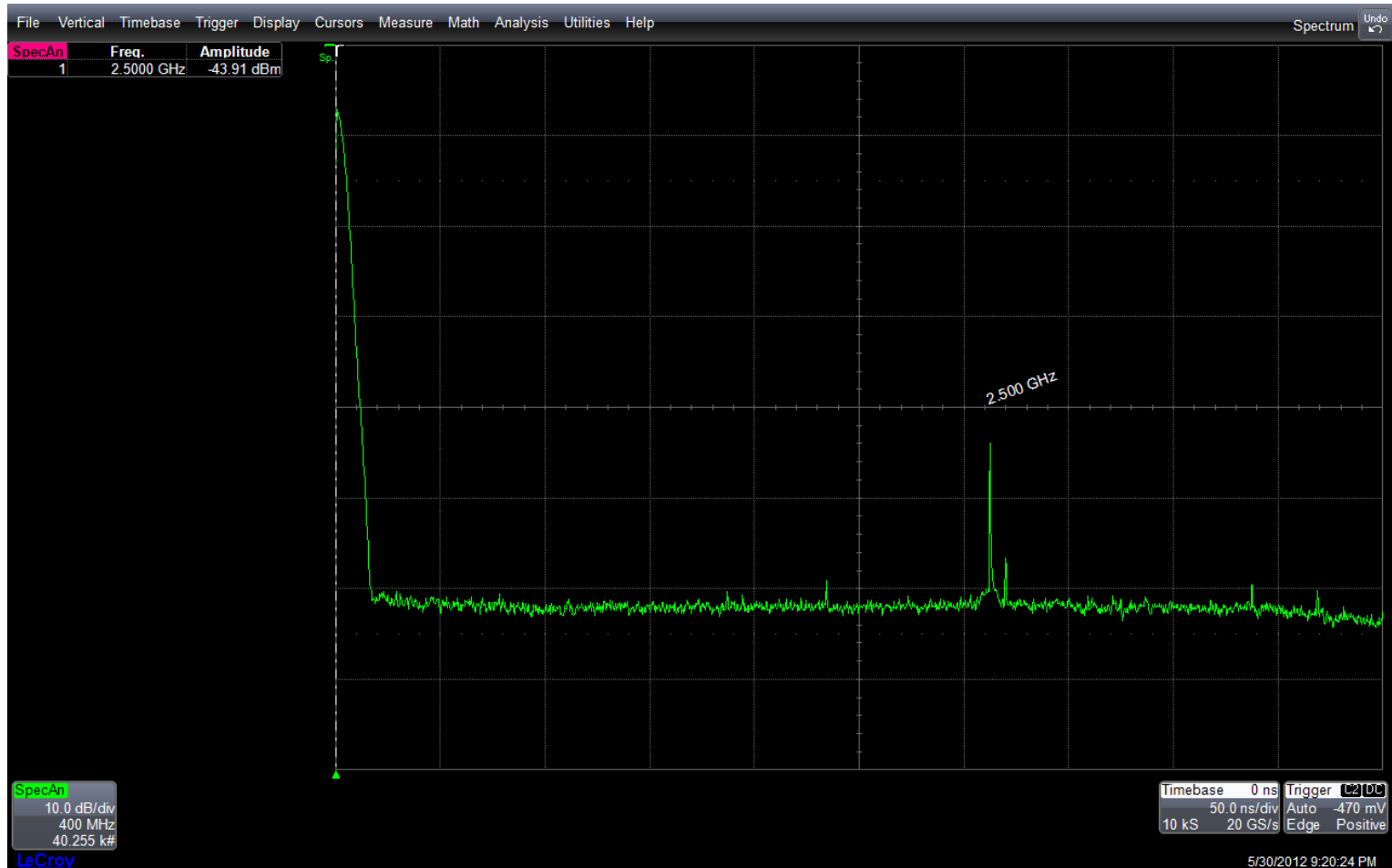
Beam Spectrum (500 MHz span, 150 kV, 28 MHz)



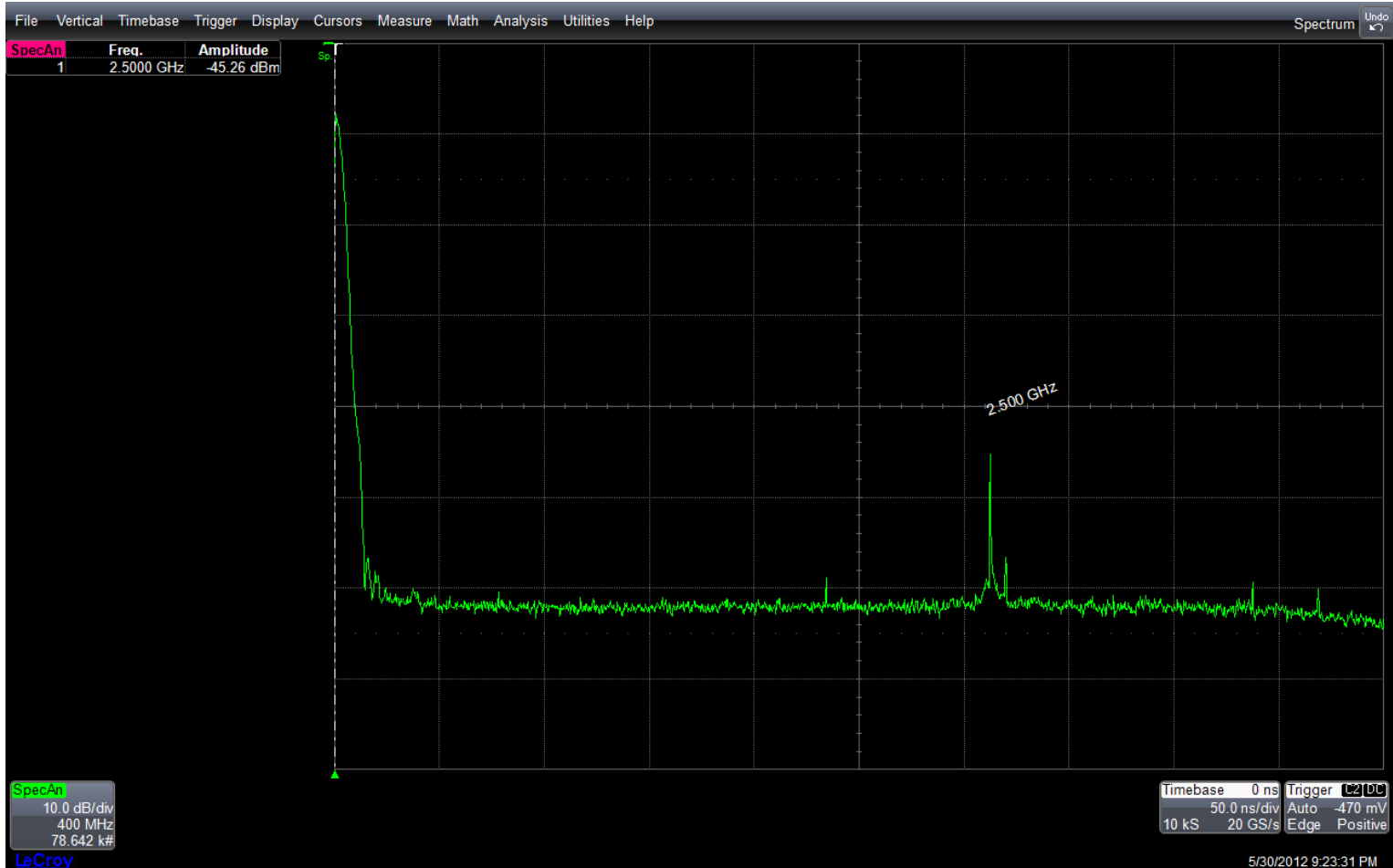
Beam Spectrum (500 MHz span, longer sampling)



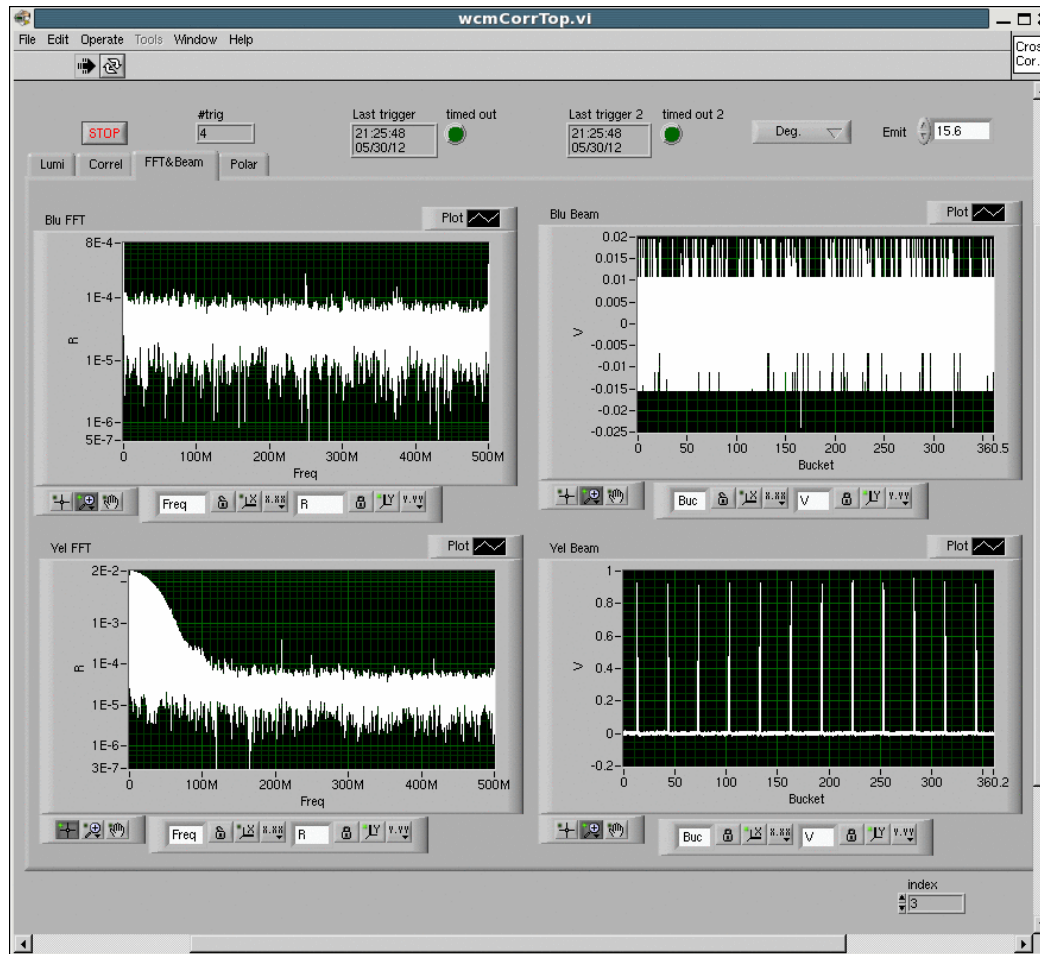
Beam Spectrum (4 GHz span, 150 kV, 28 MHz)



Beam Spectrum (4 GHz span, 75 kV, 28 MHz)



Beam Spectrum from Control System



Conclusions

- Beam orbit stability and bunch jitter were successfully measured
- We do not expect that the observed beam motion will affect CEC POP experiment, but real data will be used for simulations
- Oscilloscope noise level is above the beam spectrum power in the region of interest, measurement with spectrum analyzer can be done in background mode