

Low Energy RHIC electron Cooling (LEReC)

RHIC Time Meeting
January 7, 2020

BROOKHAVEN
NATIONAL LABORATORY

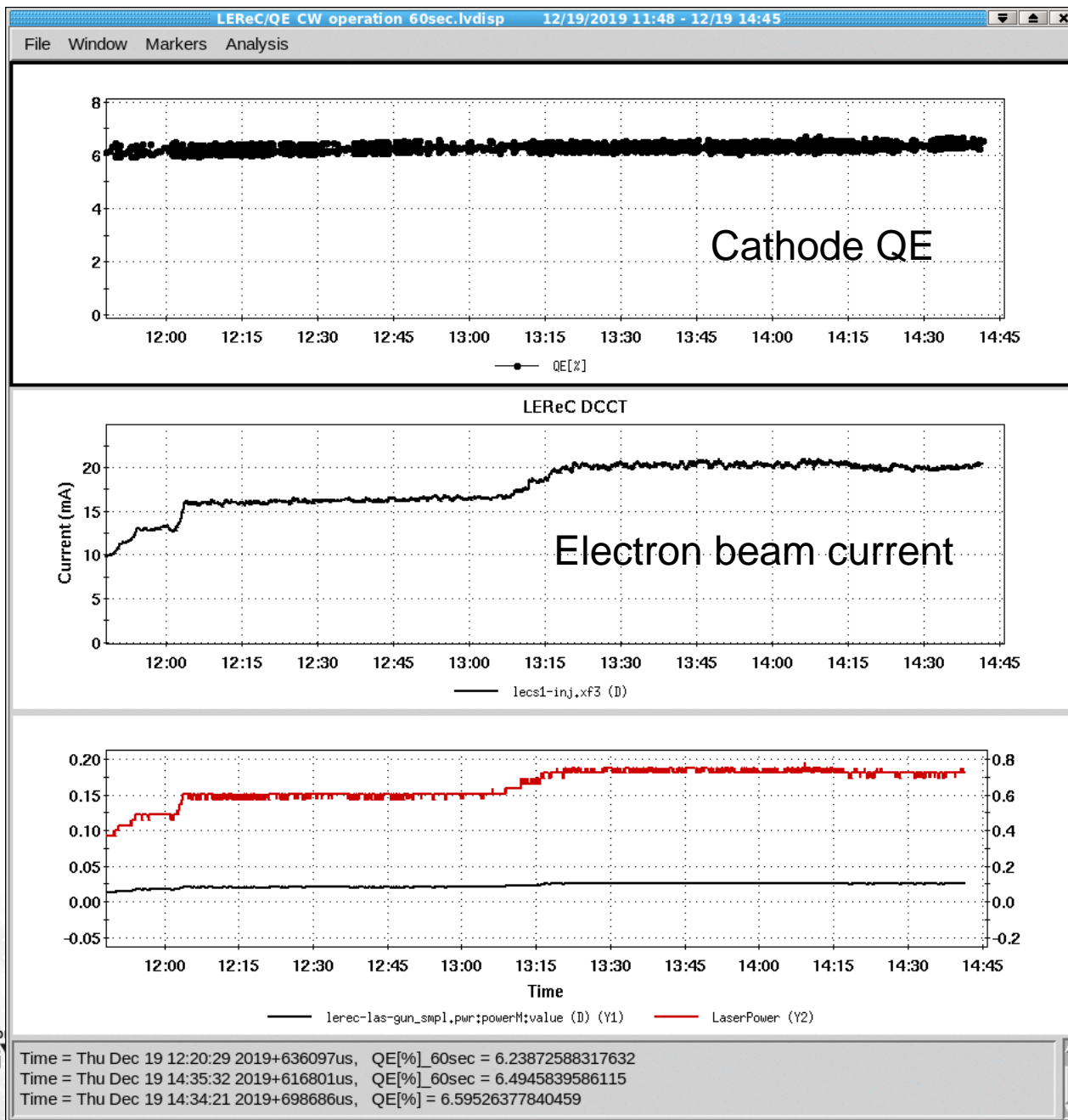
 U.S. DEPARTMENT OF
ENERGY

LEReC progress/updates for December 17-January 6

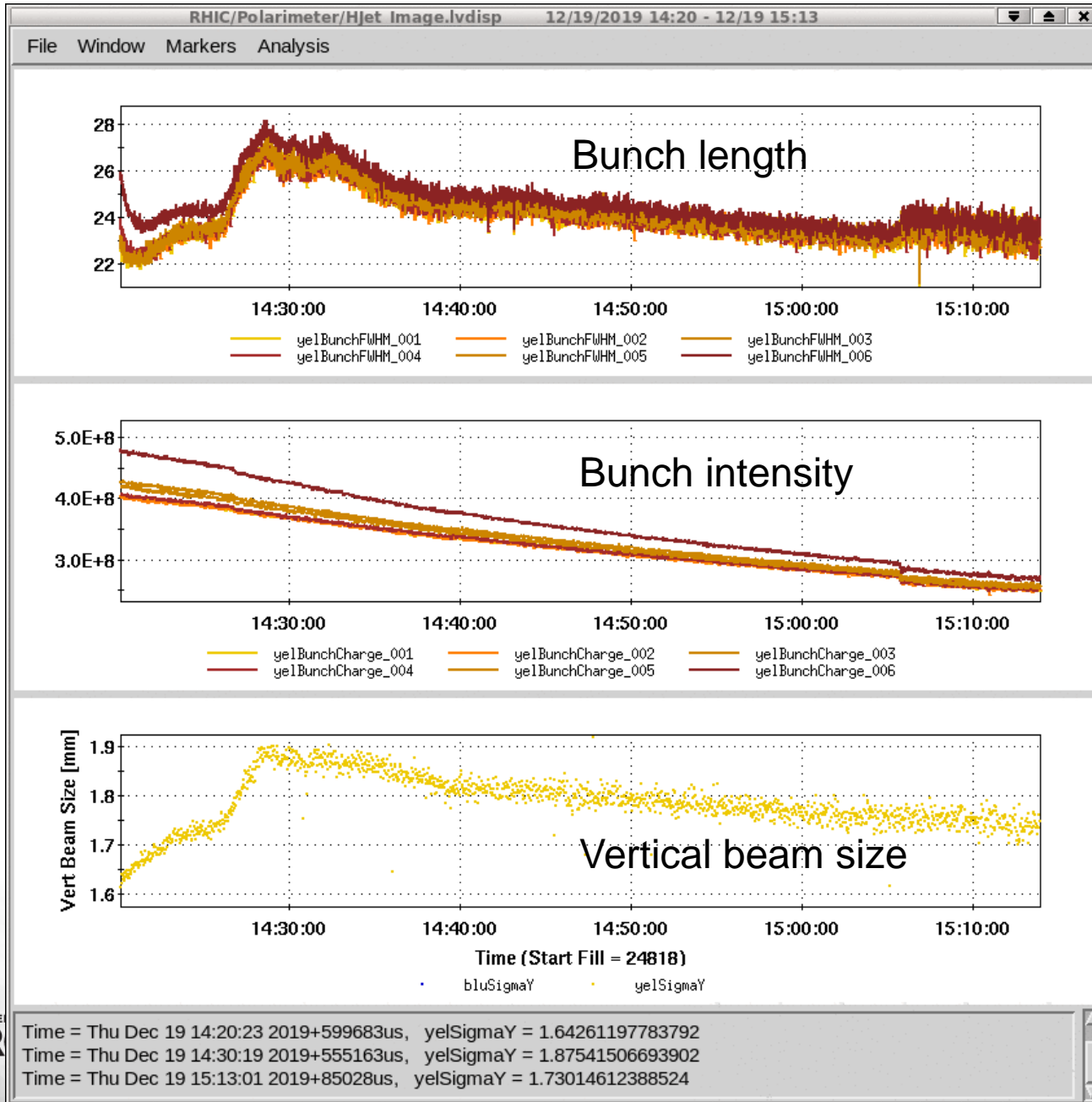
- LEReC had 5 shifts of dedicated time:
December 18, 19, 20; January 3 and 6.
- LEReC was off December 21-January 1

- BPMs testing (channel switching from BPMs buttons) and calibration
- Optimized optics for cooling in Yellow and Blue
- Re-established high-current CW running of electron beam
- Re-established cooling in CW
- Cooling/heating studies
- Re-established all LEReC systems and cooling after two weeks off

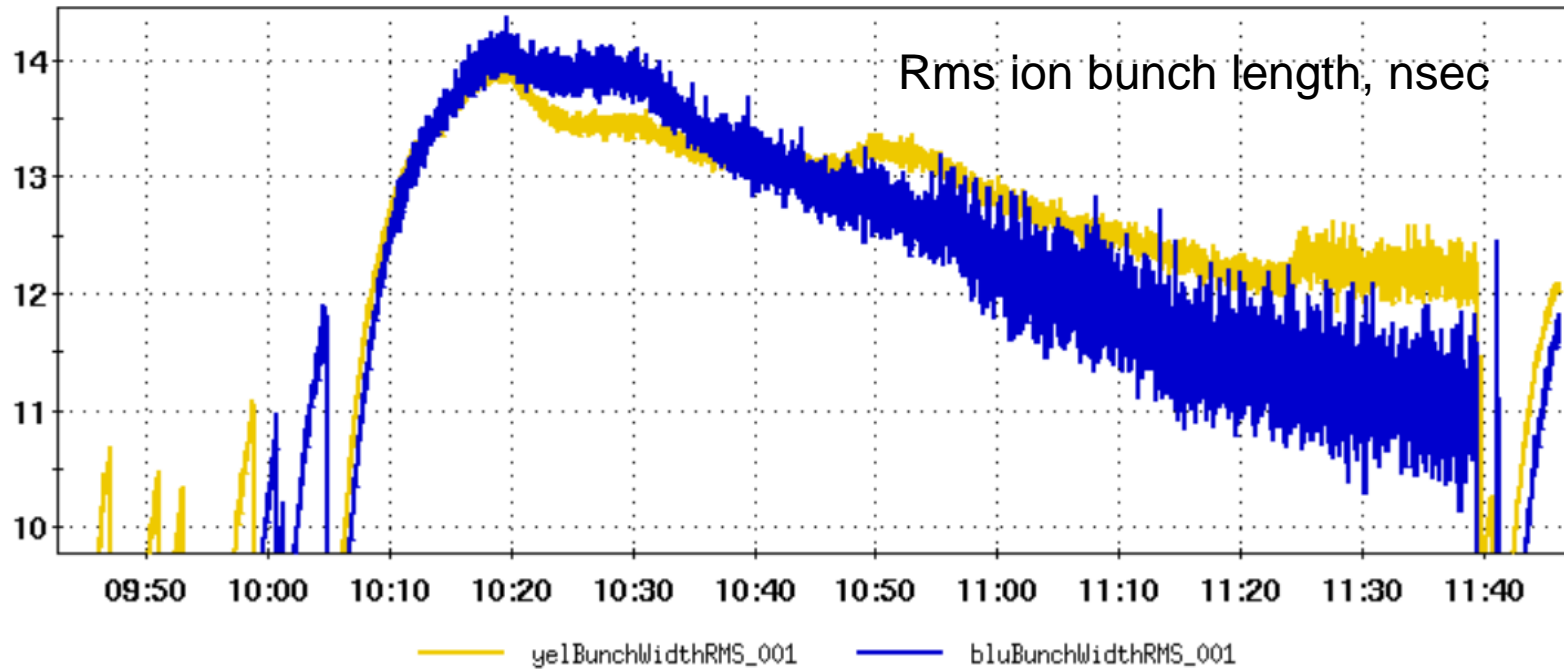
High-current CW electron beam running to HP dump



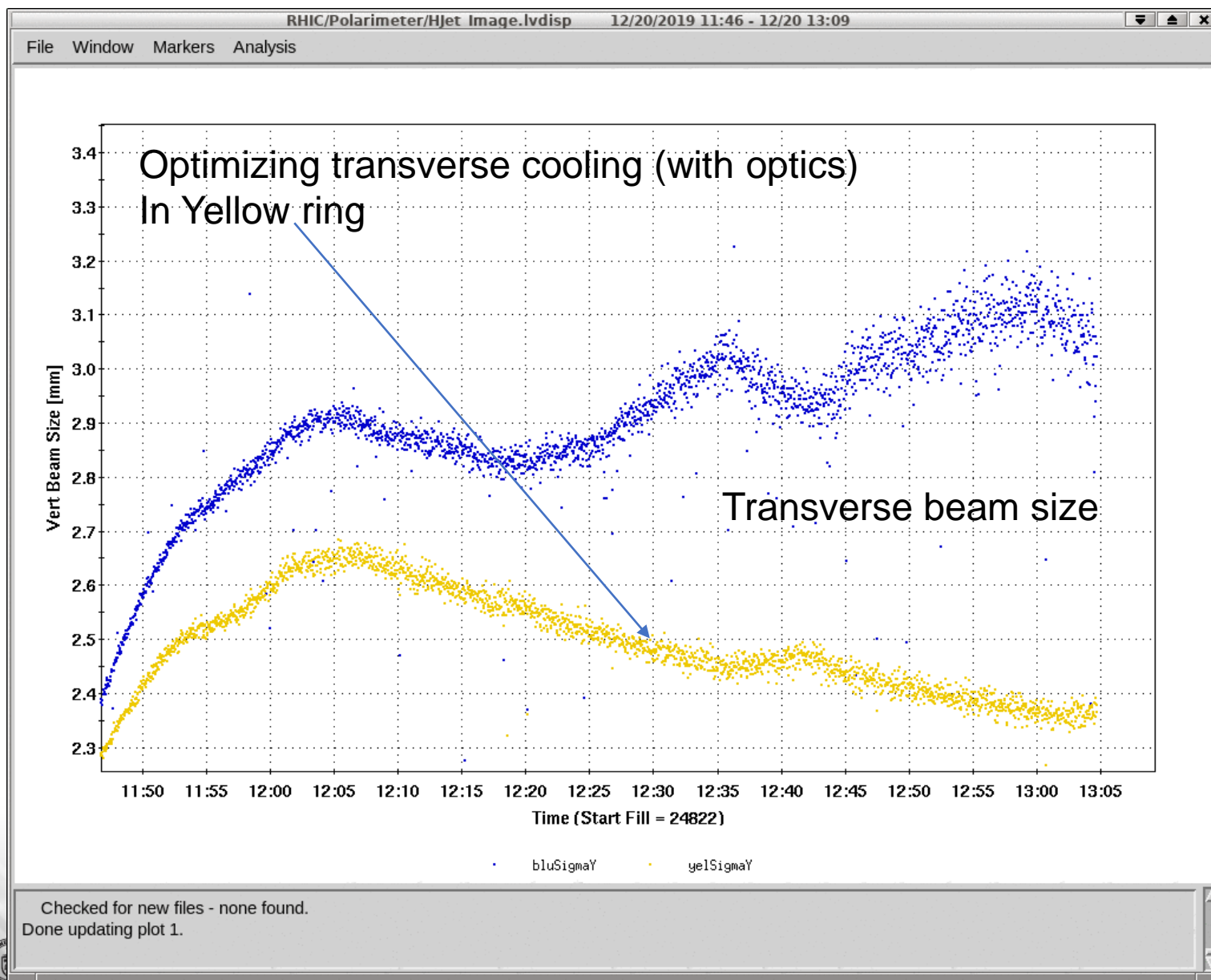
3D cooling using CW e-beam of ions in Yellow ring



Simultaneous cooling in Yellow and Blue using CW e-beam



Optimizing transverse cooling



LEReC status and plans

- Electron beam CW operation re-established
- 3D cooling re-established
- Working on BPM testing and calibrations
- Working on e-beam optics
- Re-established all systems and cooling after two weeks of shutdown

Plans:

- Started testing of cooling effectiveness with new RHIC timing (different 9MHz RF harmonic due to combined use of 9 and 28MHz RF this year), which results in significant shift of electron MB with respect to ion bunch. Will probably take few shifts to test various regimes and come up with compatibility conclusions.
- Work on transverse cooling optimization