

# Low Energy RHIC electron Cooling (LEReC)

RHIC Time Meeting  
February 25, 2020

**BROOKHAVEN**  
NATIONAL LABORATORY

 U.S. DEPARTMENT OF  
**ENERGY**

# LEReC progress/updates for February 11-25

- **LEReC was off from operation February 11-23:**
  - CW laser running and tests with Gun off
  - pulsed e-beam is provided for energy feedback tests
  - electron beam in pulsed mode was provided for other tests

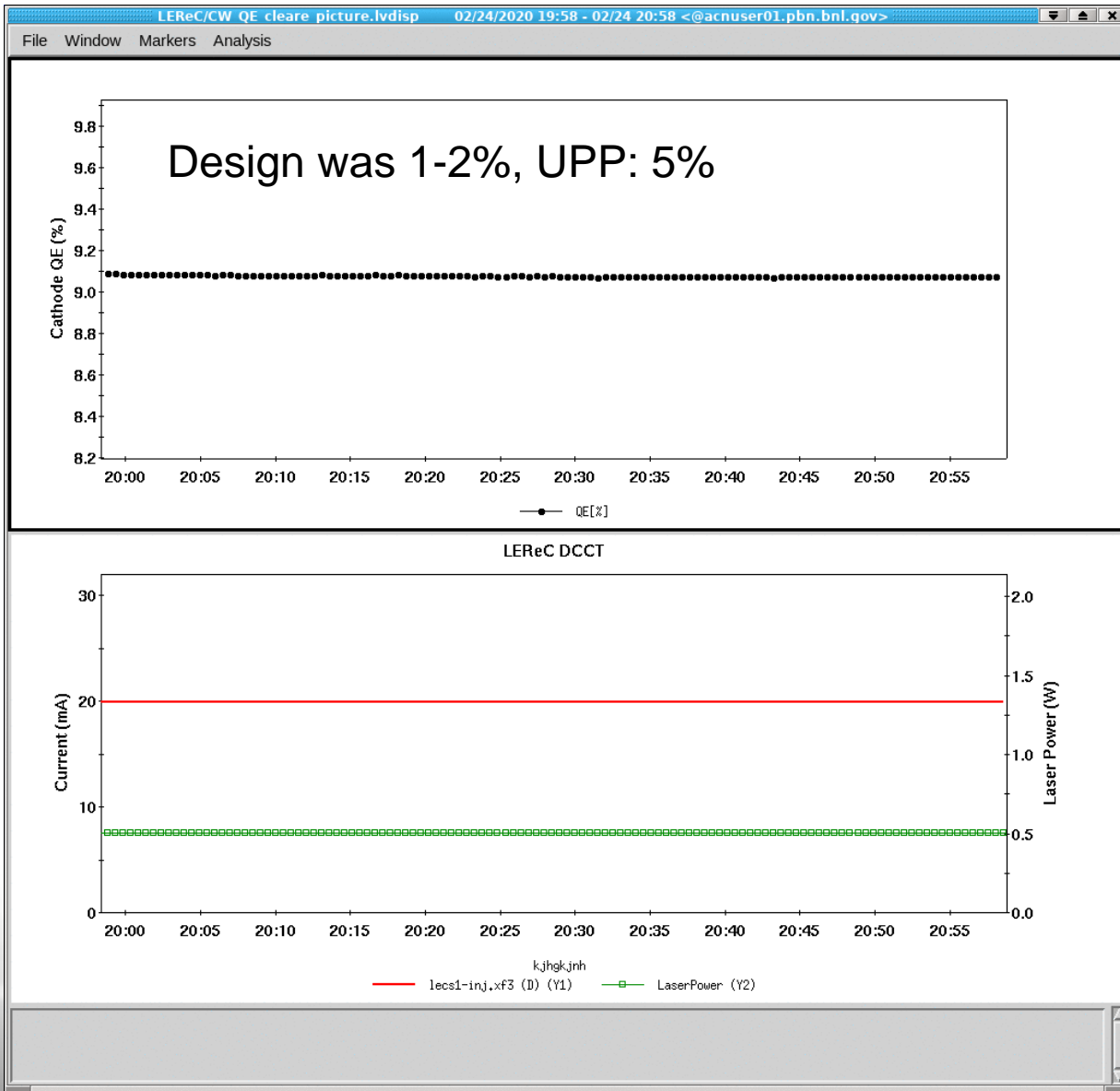
## Issues:

- Several issues with the laser
- Gun trips started on February 19; HVPS inverter was replaced on February 20 which addressed the issue

- **LEReC operation for Physics at 4.6 GeV was reestablished on Feb. 24:**

- New cathode was put into the Gun
- Electron beam optics and e-beam parameters checked
- CW e-beam was re-established
- Cooling of ions was re-established

# Good cathode QE – too good

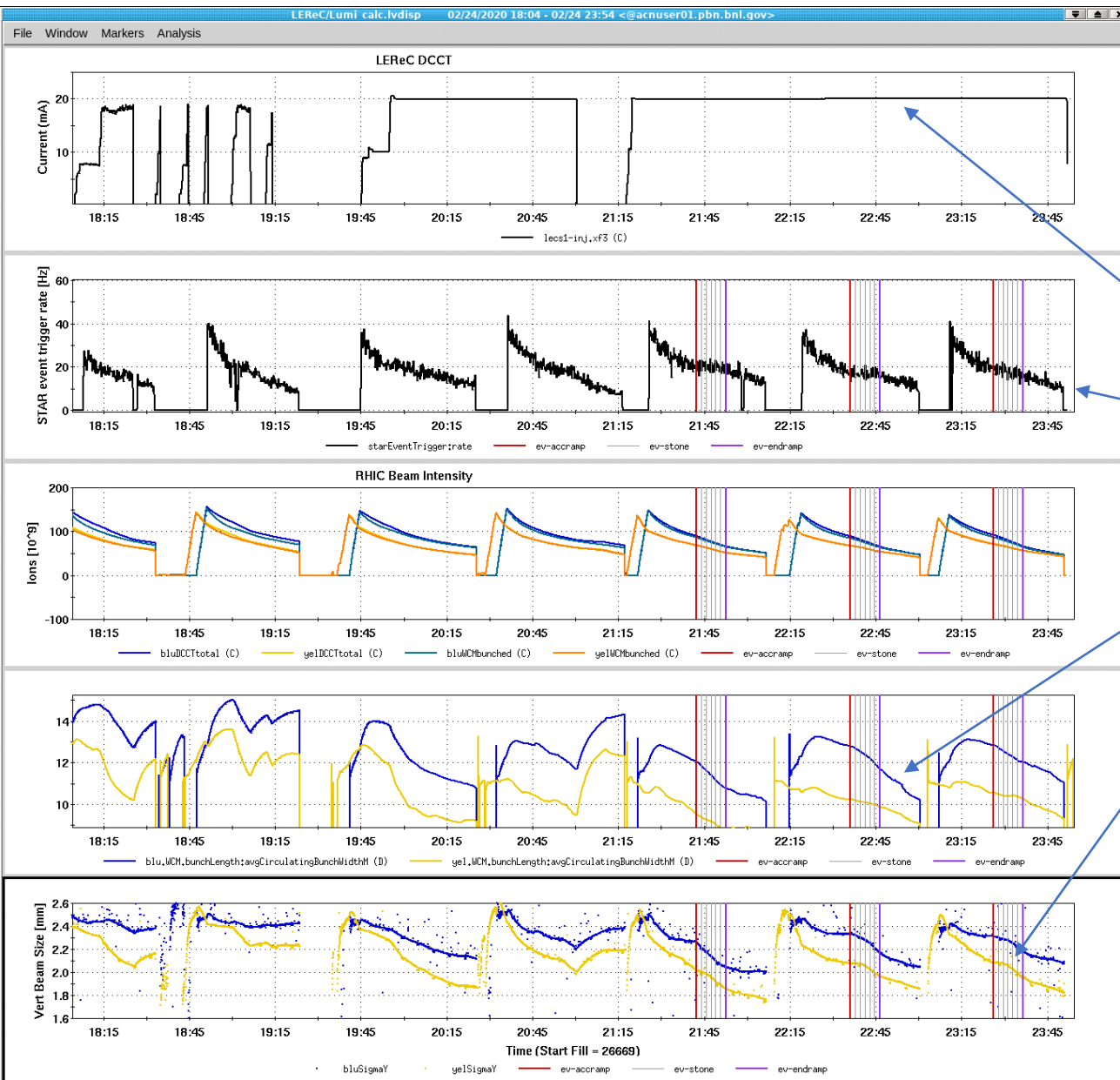


Cathode QE is too good:

Requires setting up laser for very low power when we start ramping up electron current from small values, which causes problems with laser intensity control.

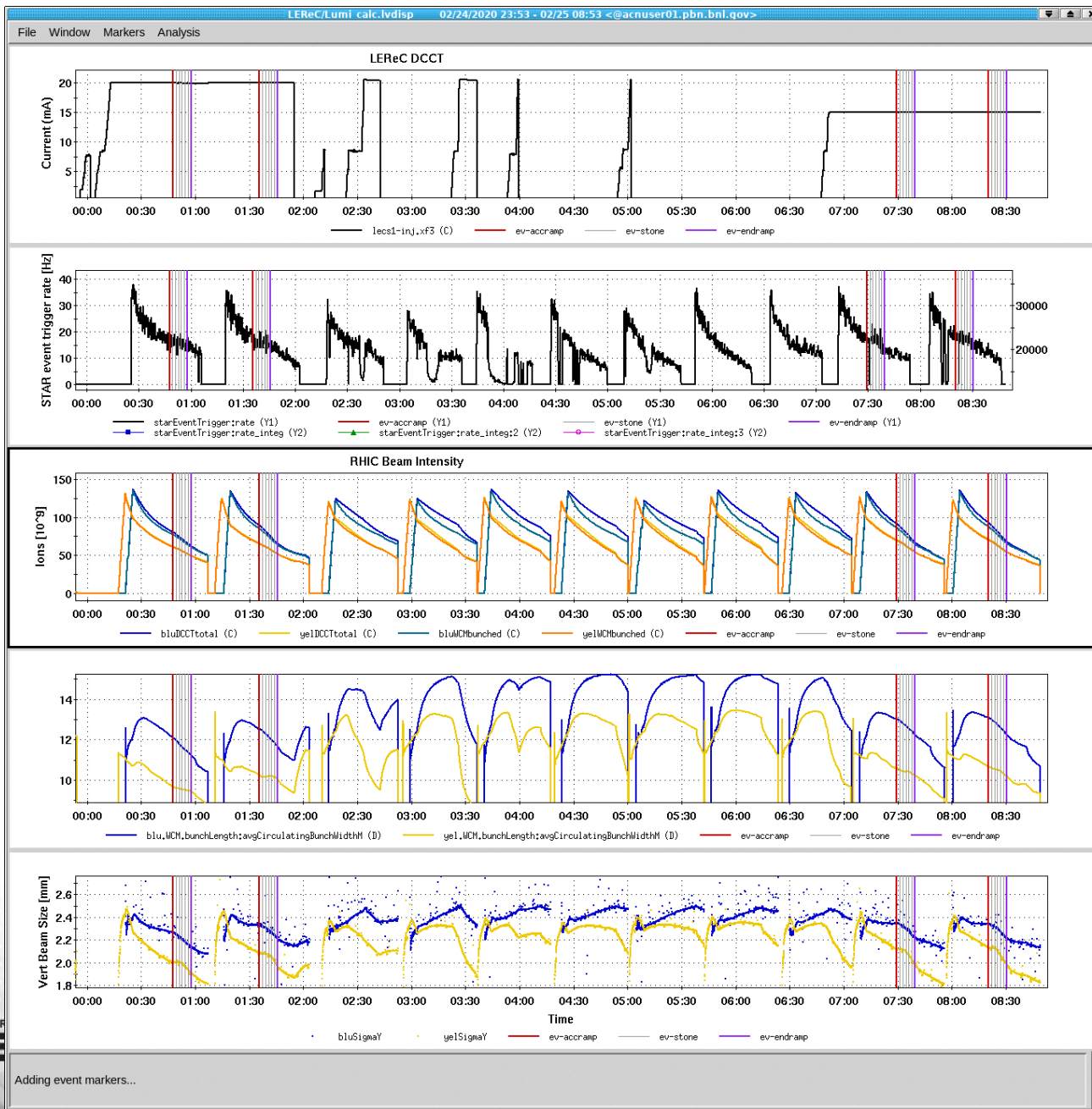
With present laser configuration intensity control is after the shaping crystals which does not allow for simple laser power adjustments for very low values.

# First stores with cooling: February 24



Cooling re-established

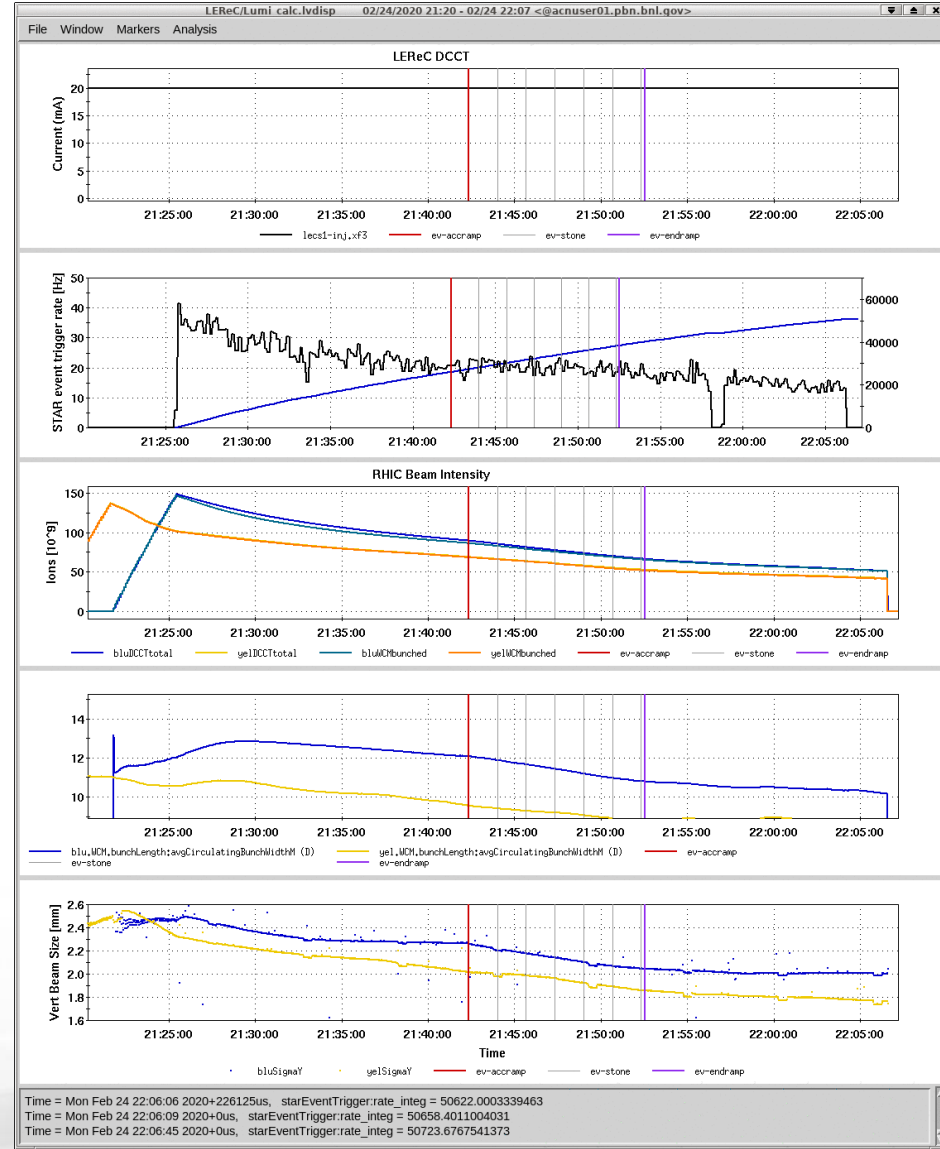
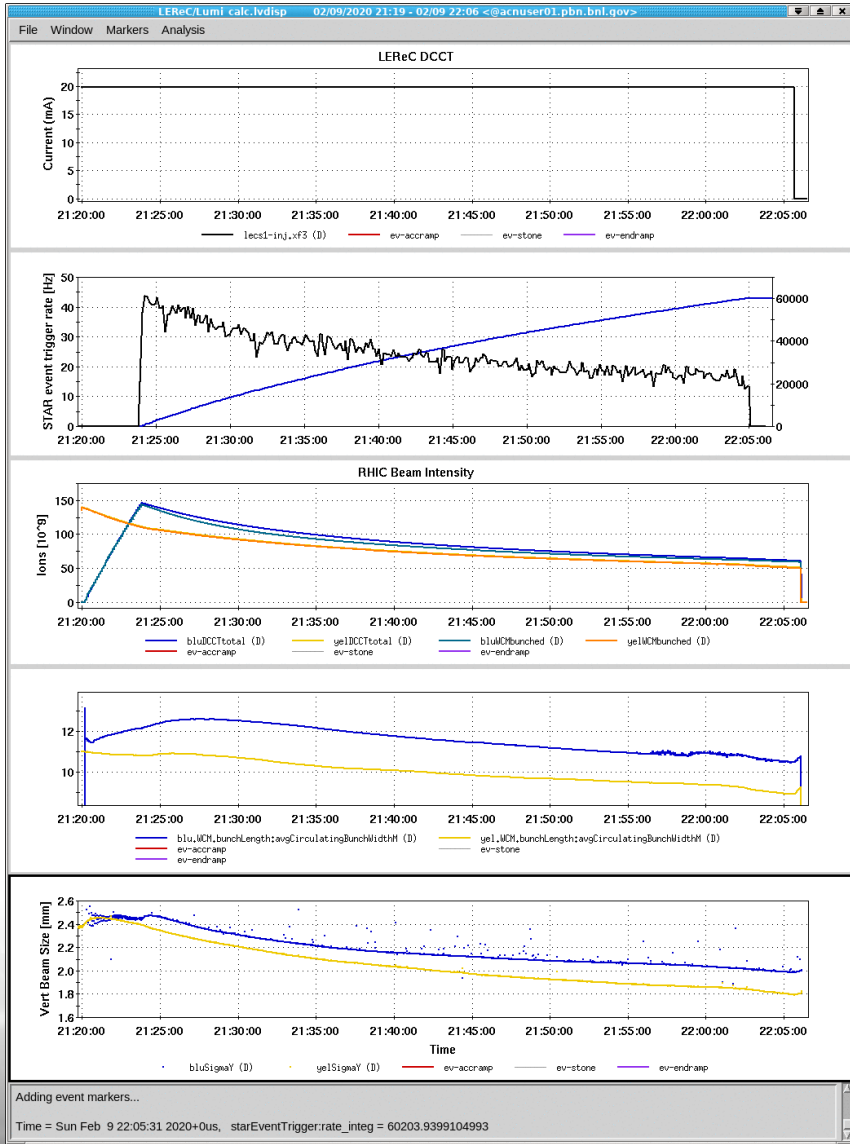
# February 25 – no cooling from 2-7am



# Initial cooling performance now vs two weeks ago

February 9, Integral(event)=60k

February 24, Integral(event)=51k





# LEReC status and plans

- Re-started LEReC running for RHIC operations.
- Started transition of running LEReC accelerator and restoring cooling by the MCR crew.

## Plans:

- Support LEReC running by MCR
- Establish 24/7 stable operation with cooling (all LEReC systems)
- Perform some cooling studies and adjustments: different electron charges, better energy matching, better optics, etc.