

Low Energy RHIC electron Cooling (LEReC)

RHIC Time Meeting
February 11, 2020

BROOKHAVEN
NATIONAL LABORATORY

 U.S. DEPARTMENT OF
ENERGY

LEReC progress/updates for February 4-10

- LEReC performance during 5-day non-stop operation to establish baseline for Physics running at 9.2 GeV c.m.:

1. LEReC high-current accelerator provided stable running for most of the time:

Observed problems:

SRF cavity: tripped several times – quick recovery

Laser: several problems (took longer time to diagnose), most were addressed during the run; long-term laser testing is underway

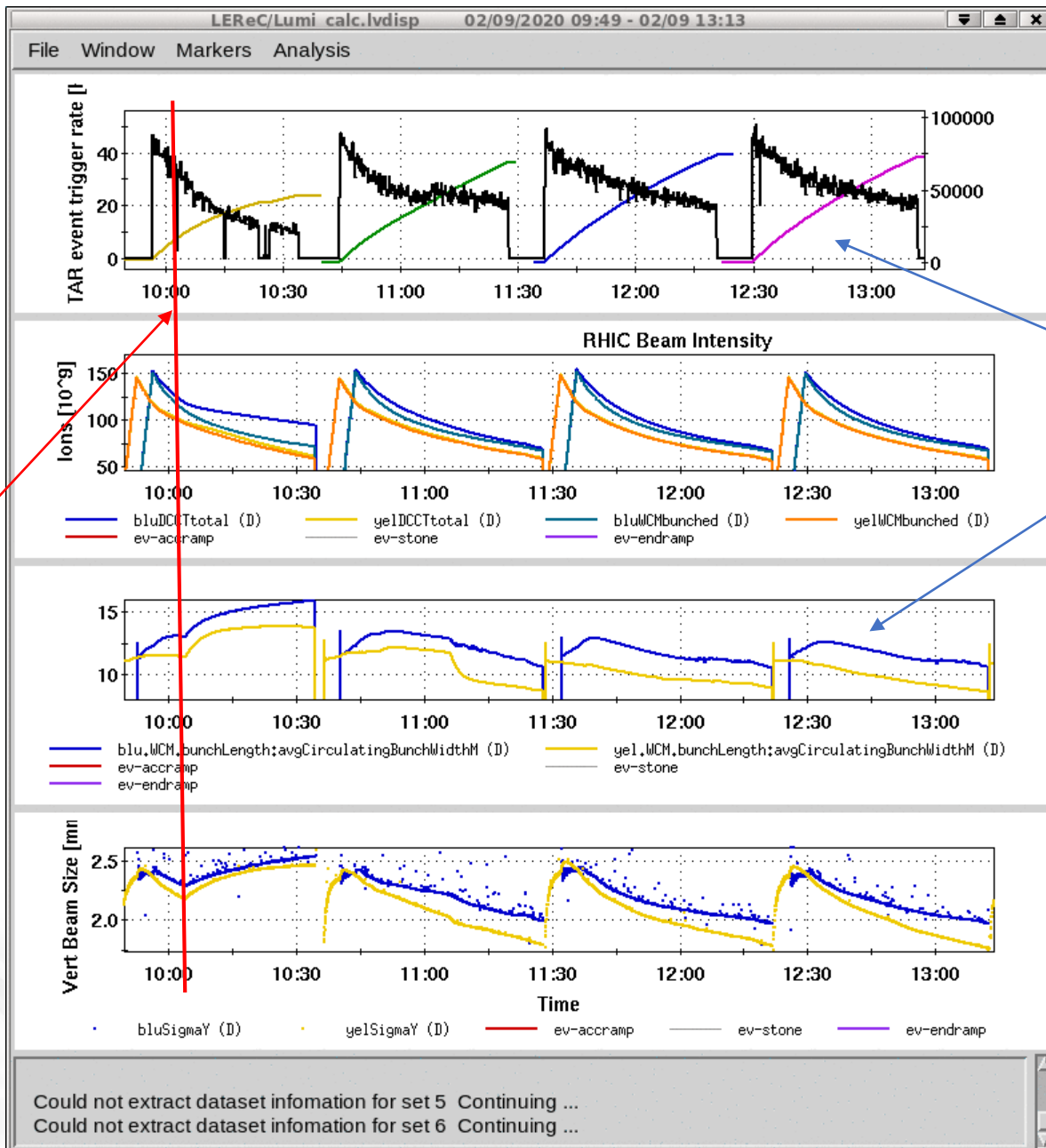
2. LEReC cooling: worked fine.

Need: 1) energy feedback 2) orbit correction for cooling section

3. RHIC Ops:

Started transition of running LEReC accelerator and restoring cooling by the MCR crew. MCR did great job running LEReC accelerator.

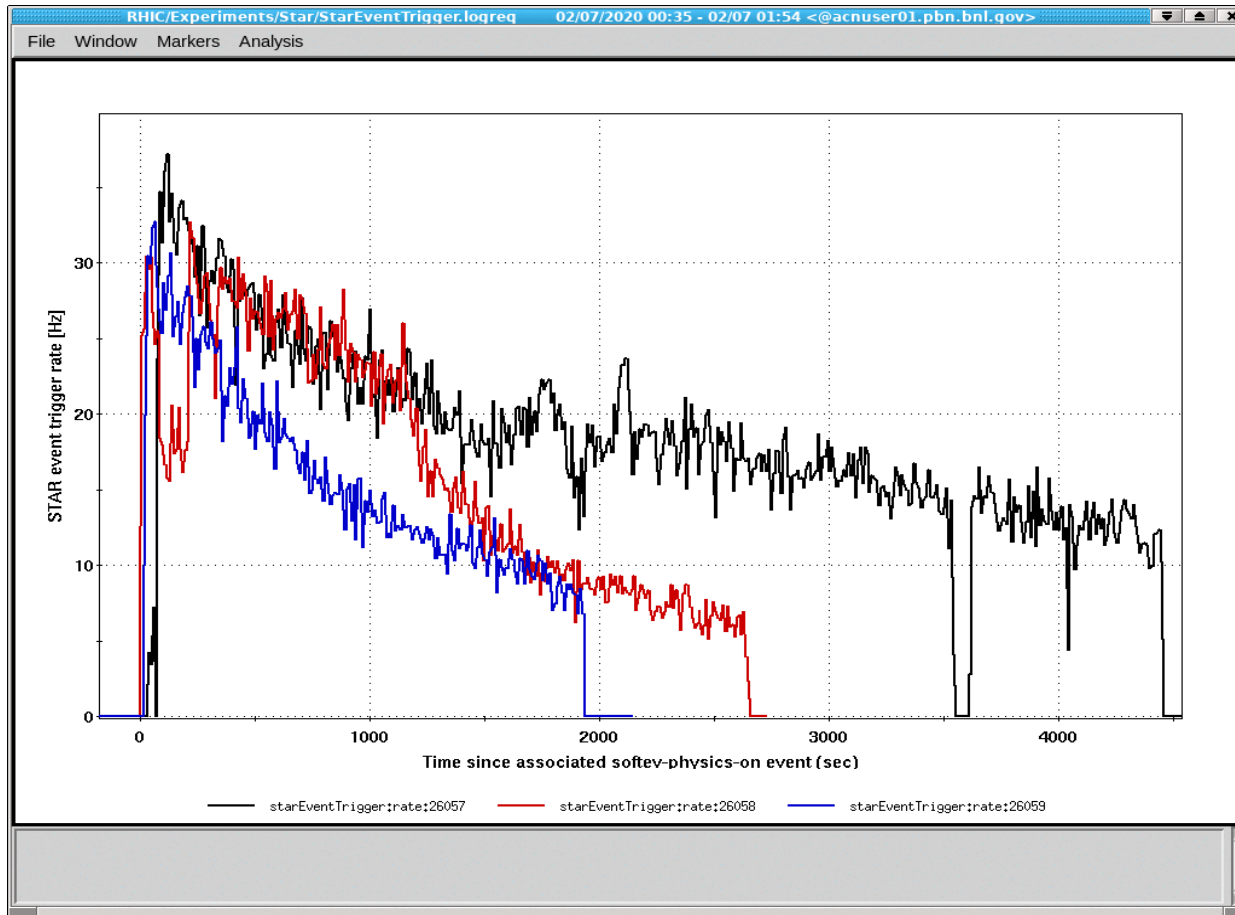
Stores with cooling (last three stores)



E-beam tripped
(cooling lost)

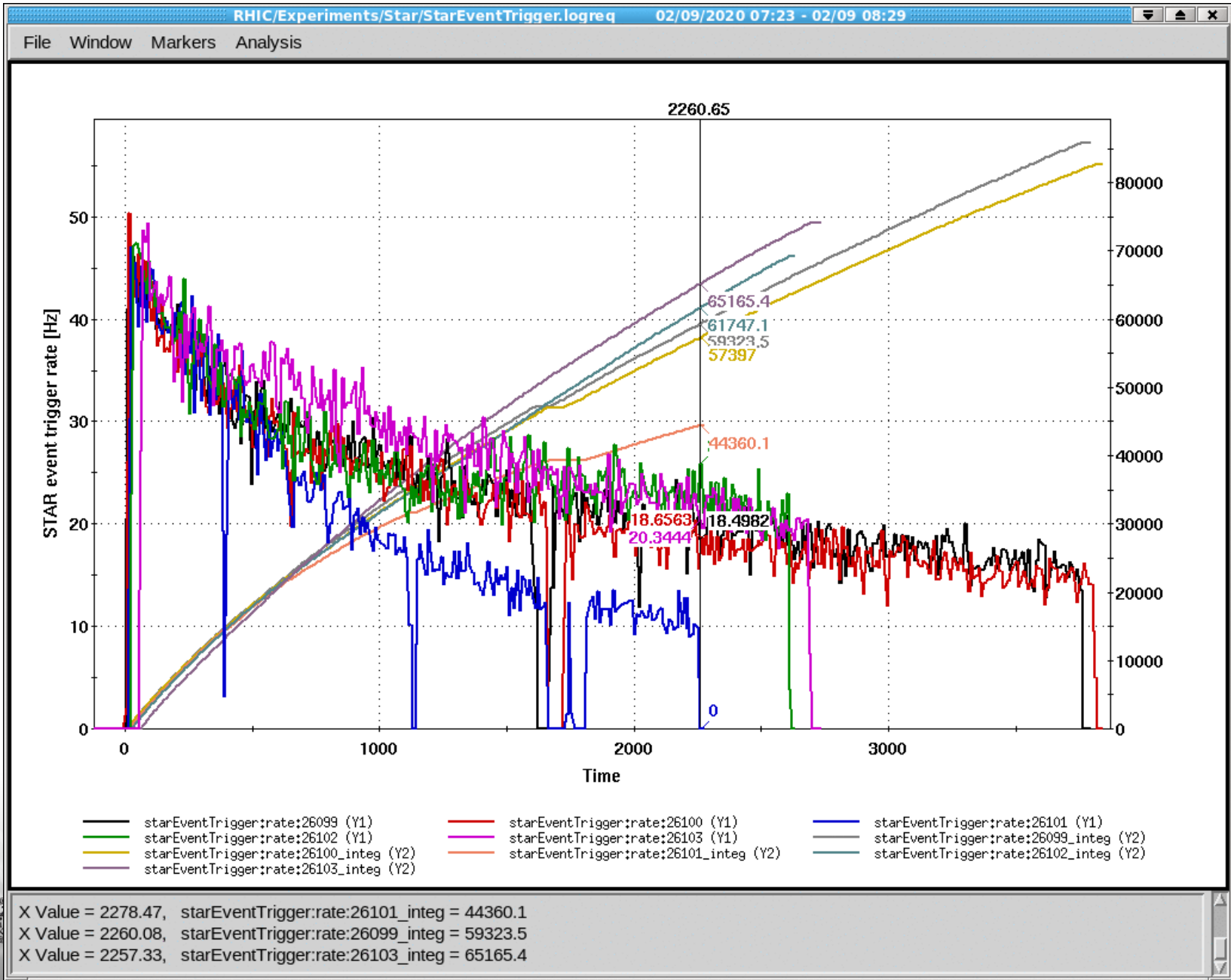
With cooling

Cooling vs no cooling

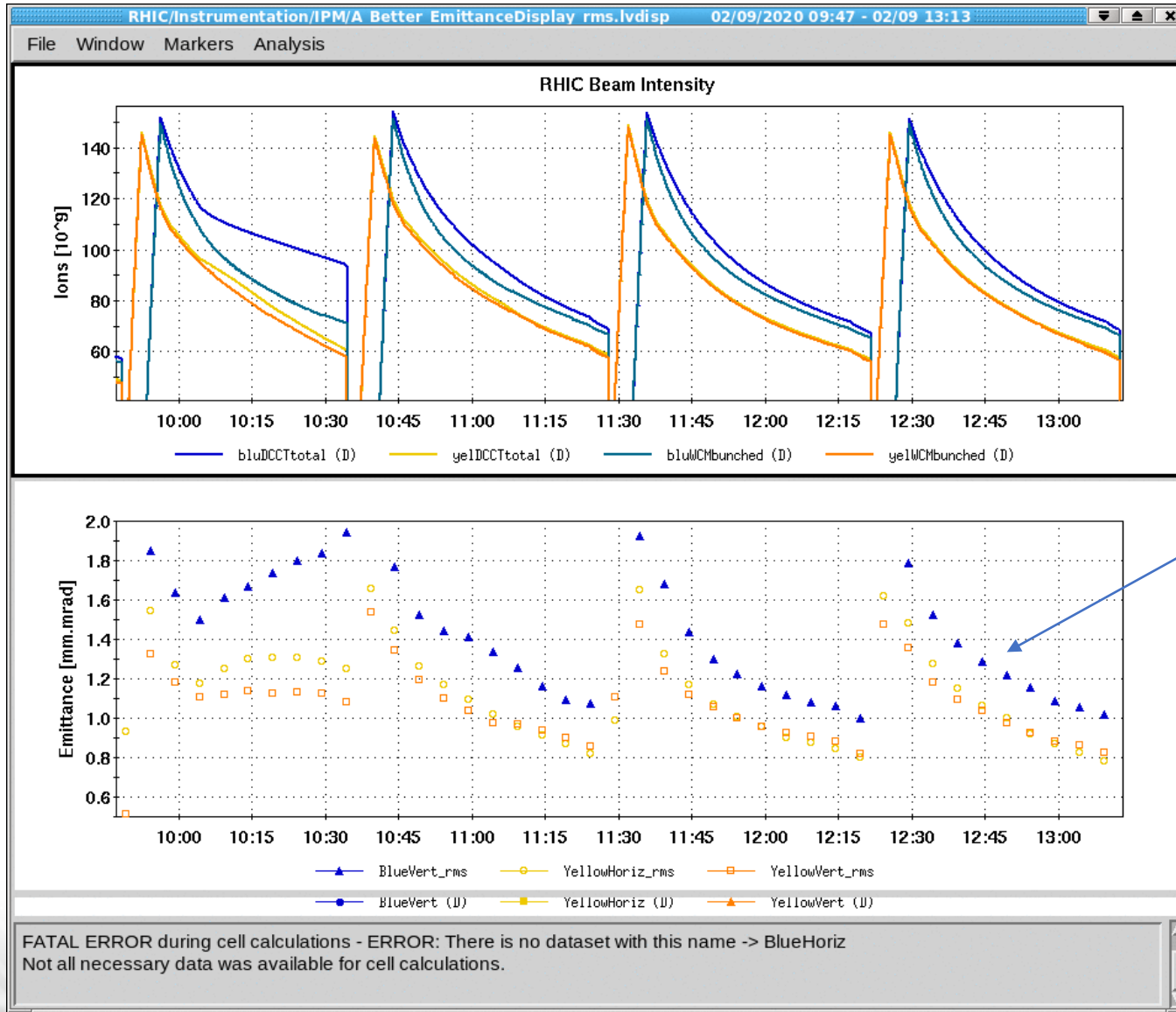


Examples of physics stores: Cooled (black), half cooled (red), no cooling (blue)

Cooling (several stores) vs no cooling (blue)



Cooling performance



Potential for further improvement with better beta-squeeze

LEReC status and plans

- Performed 5-day non-stop LEReC running for RHIC operations. LEReC shift leaders provided 24/7 support. Started transition of running LEReC accelerator and restoring cooling by the MCR crew.
- LEReC high-current accelerator and cooling performance was pretty good.
- LEReC has completed setup for physics running at 4.6GeV.

Plans:

- February 11-13: CW laser running and tests with Gun off
- February 14: pulsed e-beam is provided for energy feedback tests
- February 18-21: electron beam in pulsed mode could be provided if need for some tests
- February 24: electron beam in Pulsed mode is re-established with all the systems running for stability and other tests
- Week of February 24: possible short shift to establish CW running to HP dump to confirm that everything is working as it should.
- End of February or early March: LEReC running 24/7 for RHIC Ops once Physics at 4.6GeV starts.