

Low Energy RHIC electron Cooling (LEReC)

RHIC Time Meeting

March 3, 2020

BROOKHAVEN
NATIONAL LABORATORY

 U.S. DEPARTMENT OF
ENERGY

LEReC progress/updates for February 25 – March 3

- LEReC is in operation for Physics at 4.6 GeV starting Feb. 24:

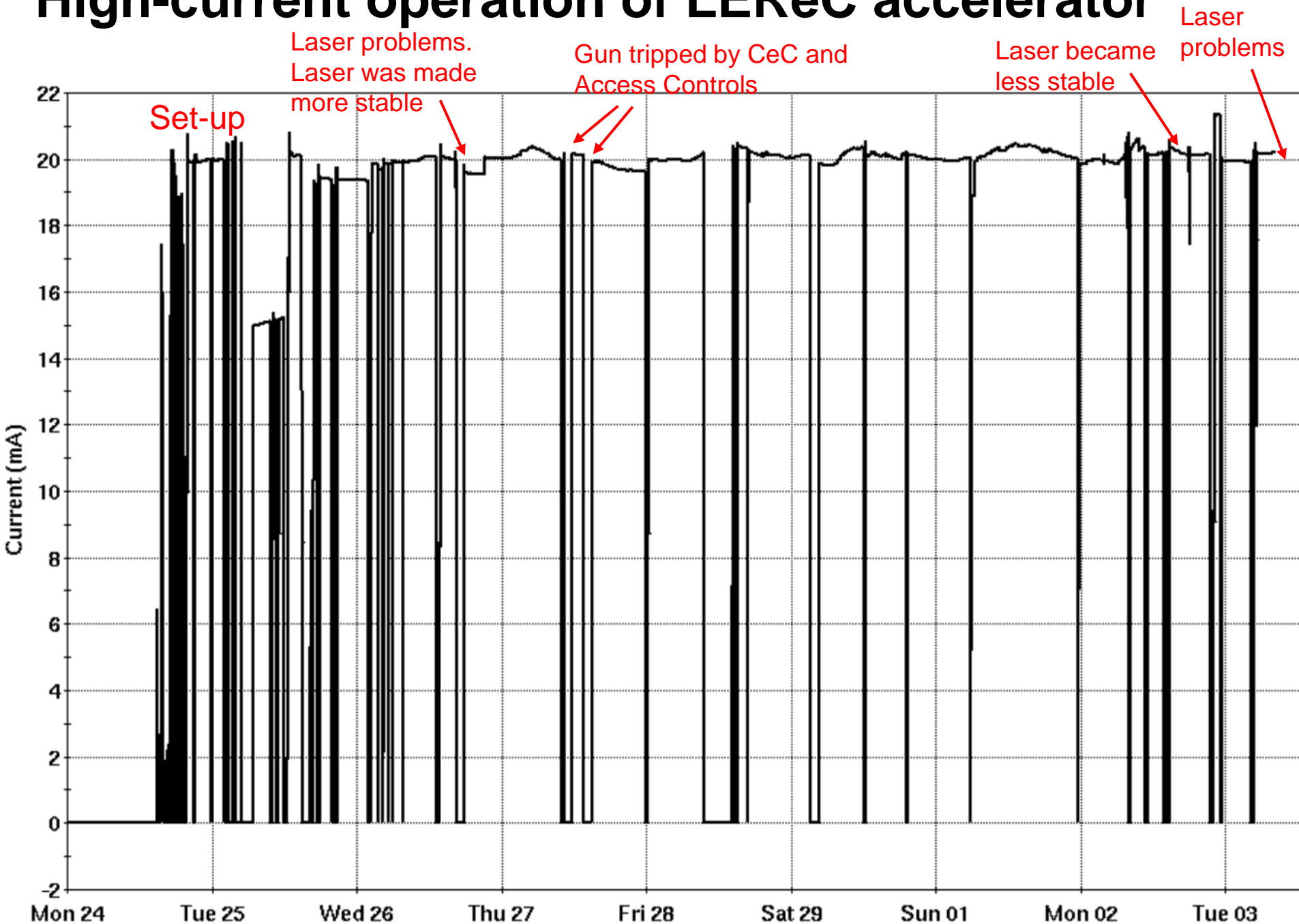
Major goals:

- Establish stable running of high-current electron accelerator
- Establish stable cooling of ion beam
- Transition LEReC running to/by MCR

Major issues with stable running of electron accelerator:

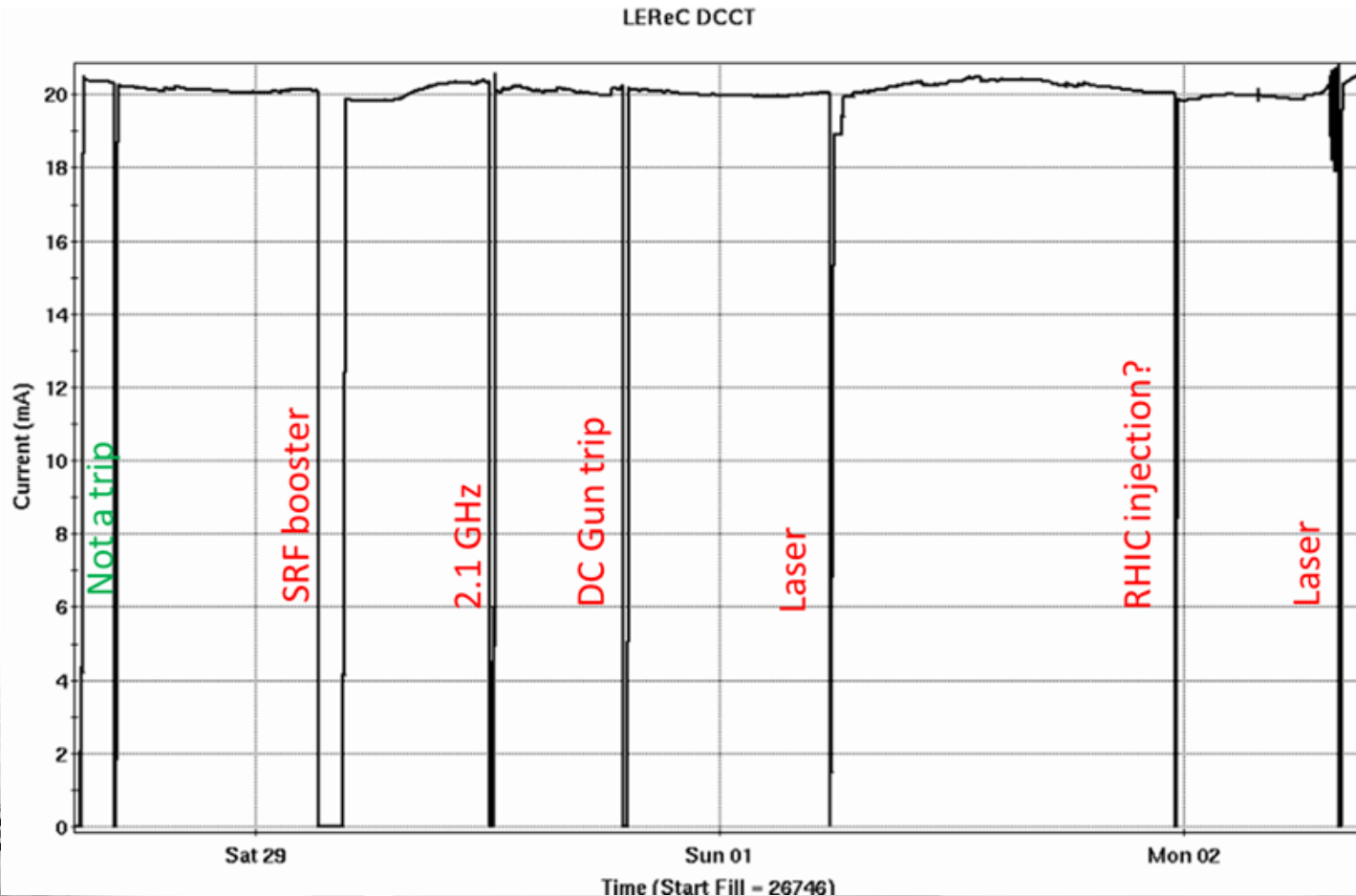
- Laser issues (stability of laser in laser trailer, laser beam profiles, position stability on the cathode)
- RF trips. Mostly SRF trips, significant number of trips on High-Level Power Amplifier
- Few times Gun was tripped while at high current. Such trips are especially bad since they result in cathode QE drop which may require gun recondition at some point, as well as damage to some equipment, such as HVPS inverter.

High-current operation of LEReC accelerator

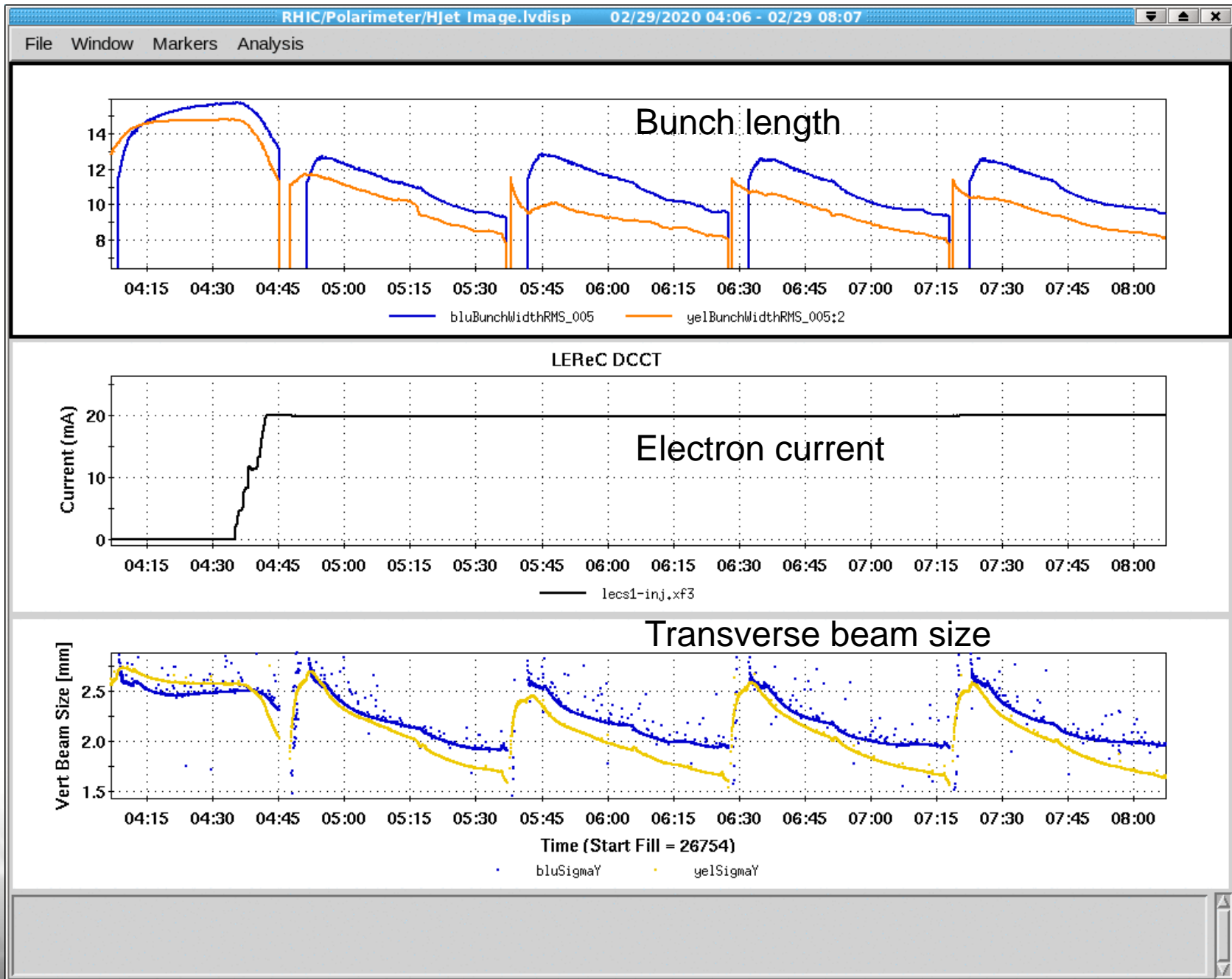


LEReC operation through weekend (operations by MCR)

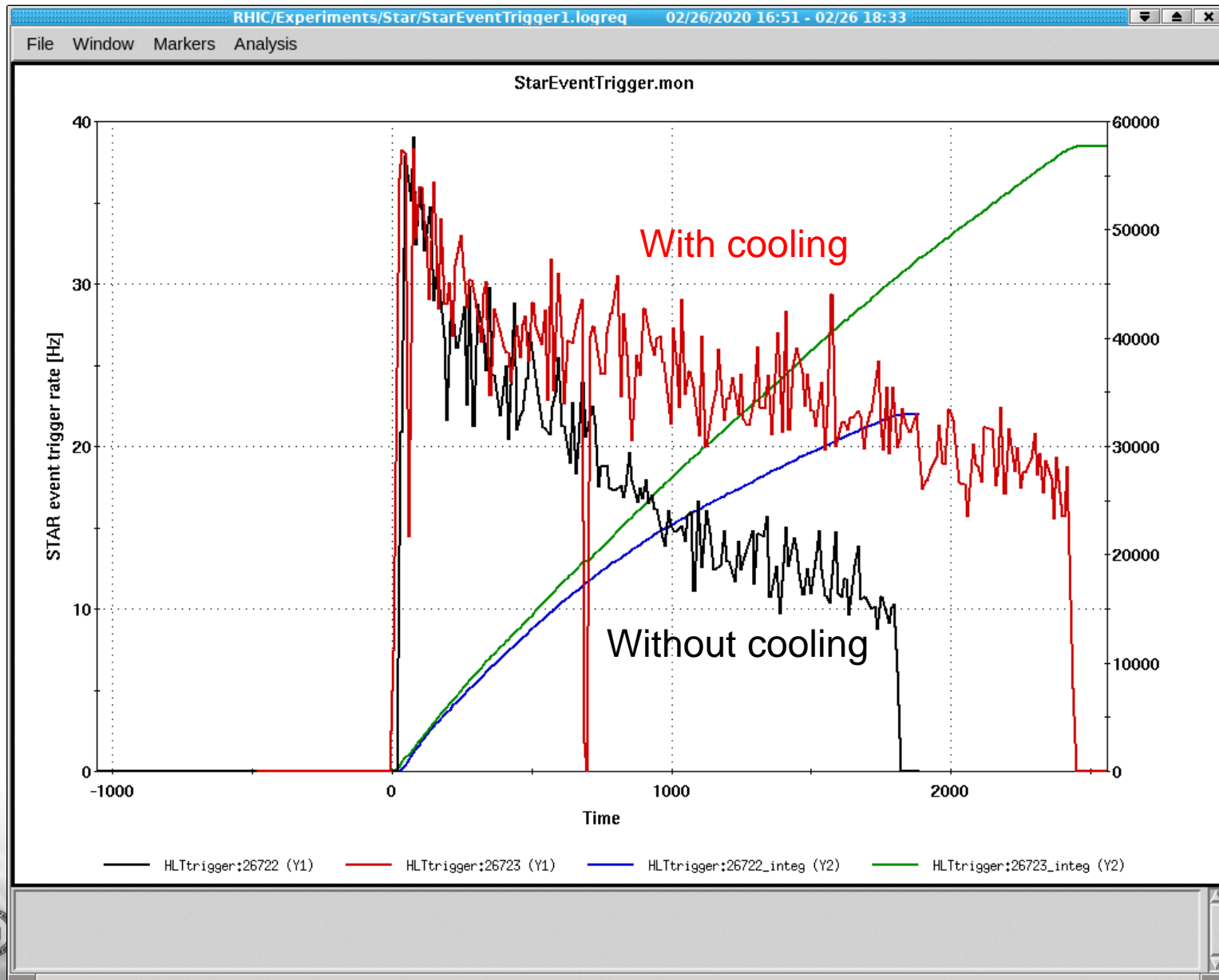
LEReC operation through the weekend
~96% uptime.



Cooling looks good when e-beam is operational



Good help from cooling in event rates



LEReC status and plans

- Transitioning of LEReC running to/by MCR is going very well
- Cooling of ion beam is consistent and does not require special efforts
- Establish stable running of high-current electron accelerator

Plans:

- Support LEReC running by MCR
- Establish 24/7 stable operation with cooling (all LEReC systems)
- No plans to start cooling commissioning at 3.85 GeV yet. First need to establish full stable running of LEReC accelerator at present energy.