

Low Energy RHIC electron Cooling (LEReC)

RHIC Time Meeting

March 10, 2020

BROOKHAVEN
NATIONAL LABORATORY

 U.S. DEPARTMENT OF
ENERGY

LEReC progress/updates

- **LEReC is in operation for Physics at 4.6 GeV:**

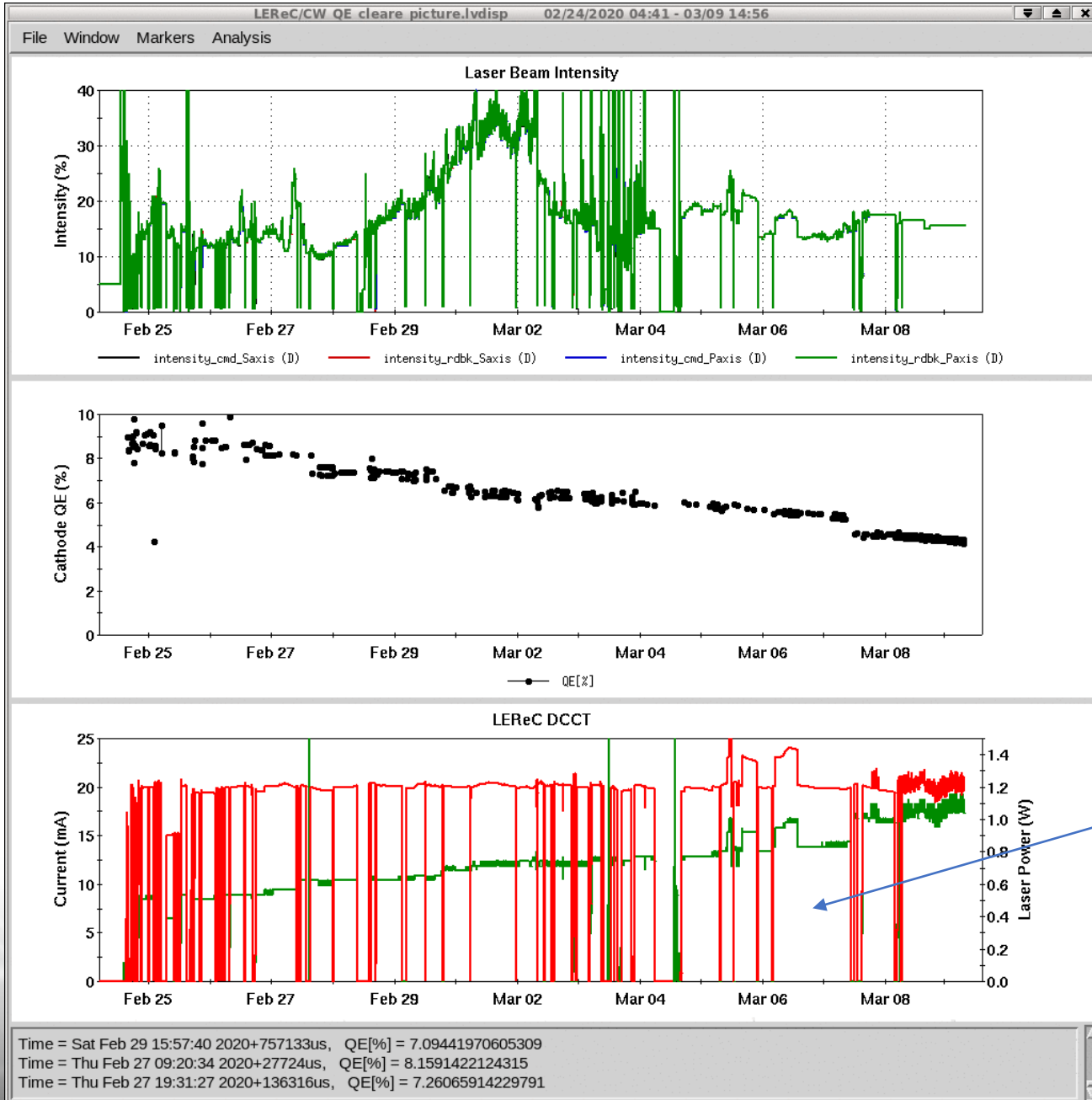
Major goals:

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

Major issues with stable running of electron accelerator:

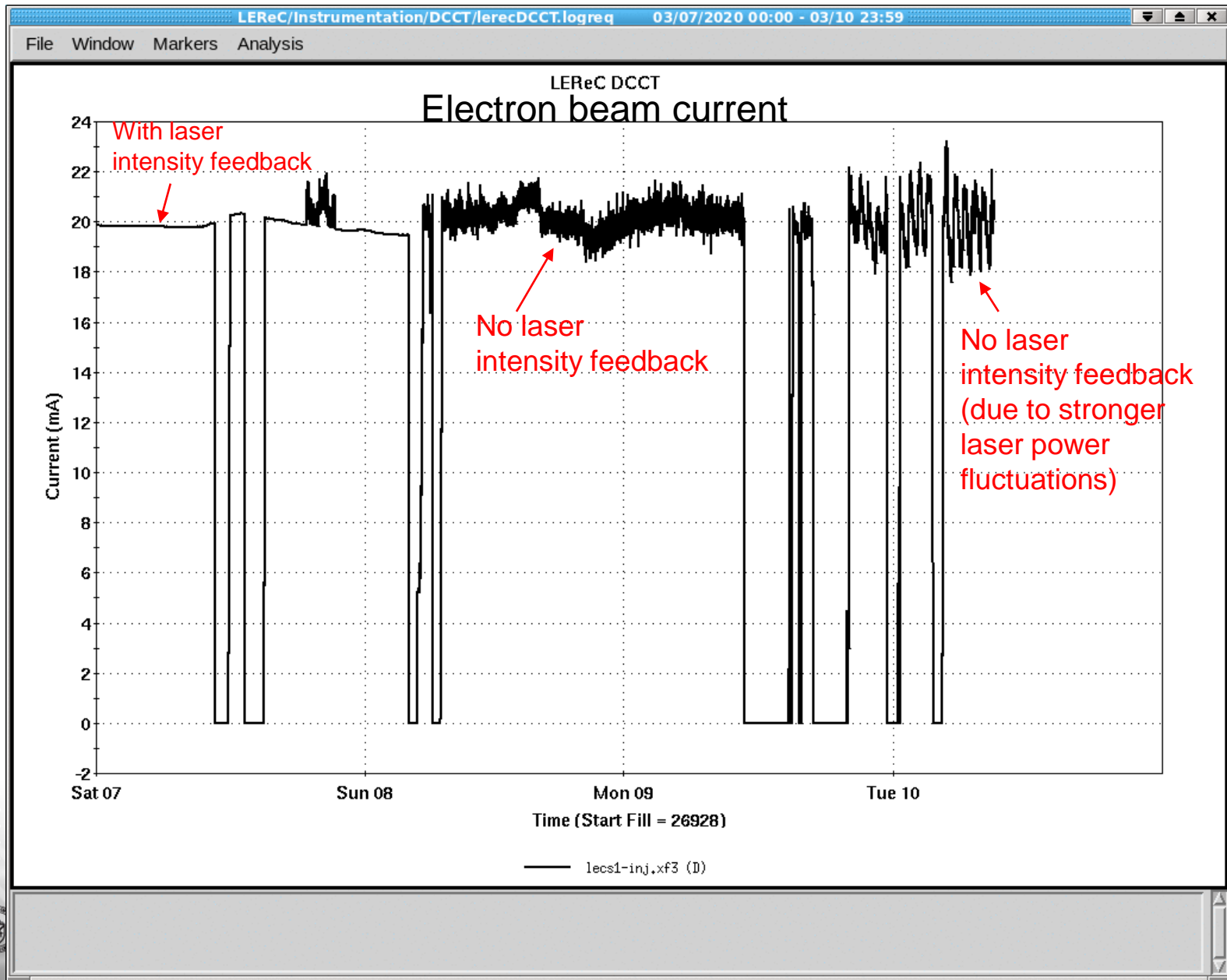
- Following laser work during Maintenance on March 4, very stable operation for few days. Additional laser issue came back over weekend (photodiode, March 8) and 60W amplifier (March 9)
- Had one more Gun trip while at high current. Such trips are especially bad since they result in cathode QE drop which may require gun recondition at some point, as well as damage to some equipment, such as HVPS inverter.

LEReC operation

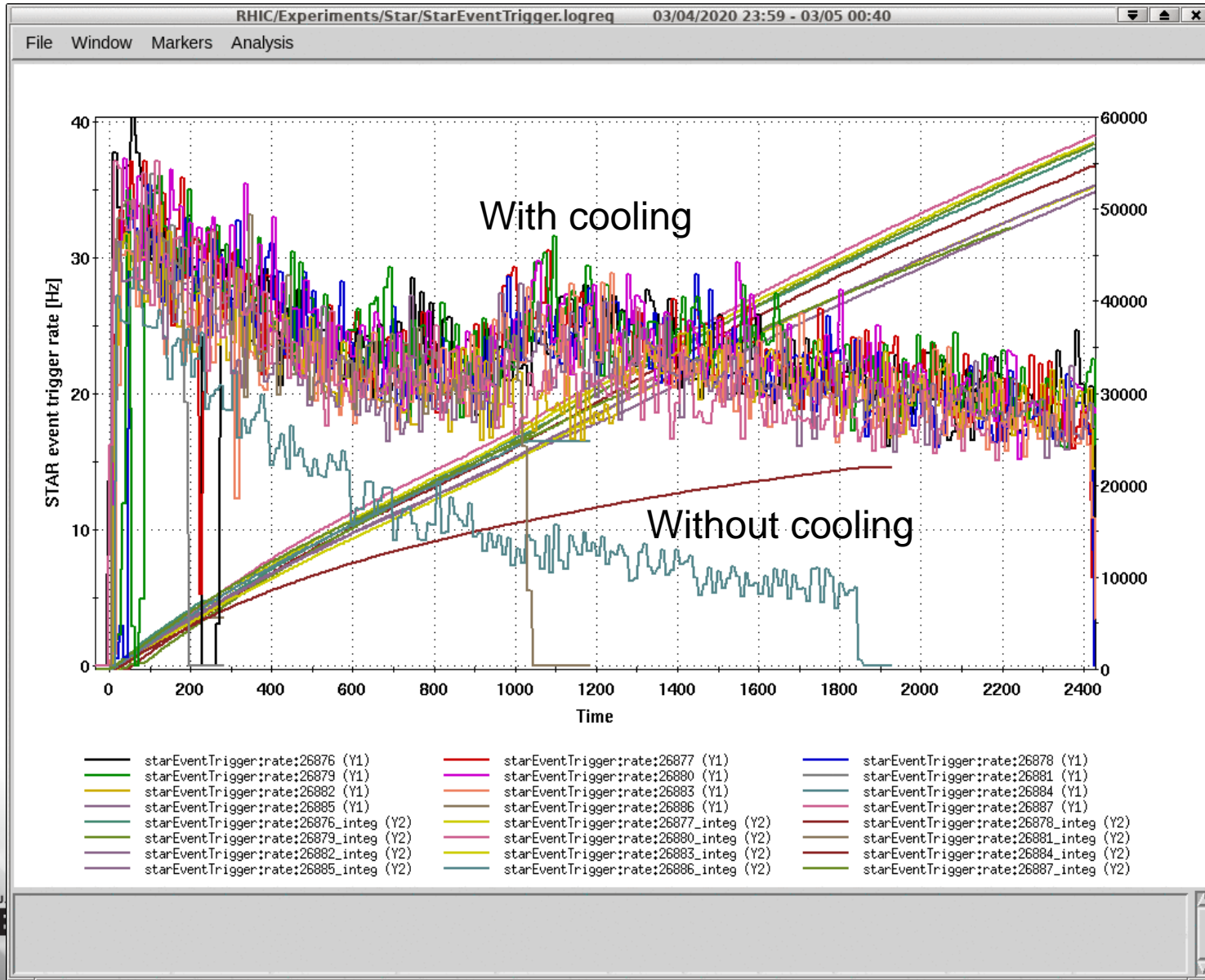


Very stable operation

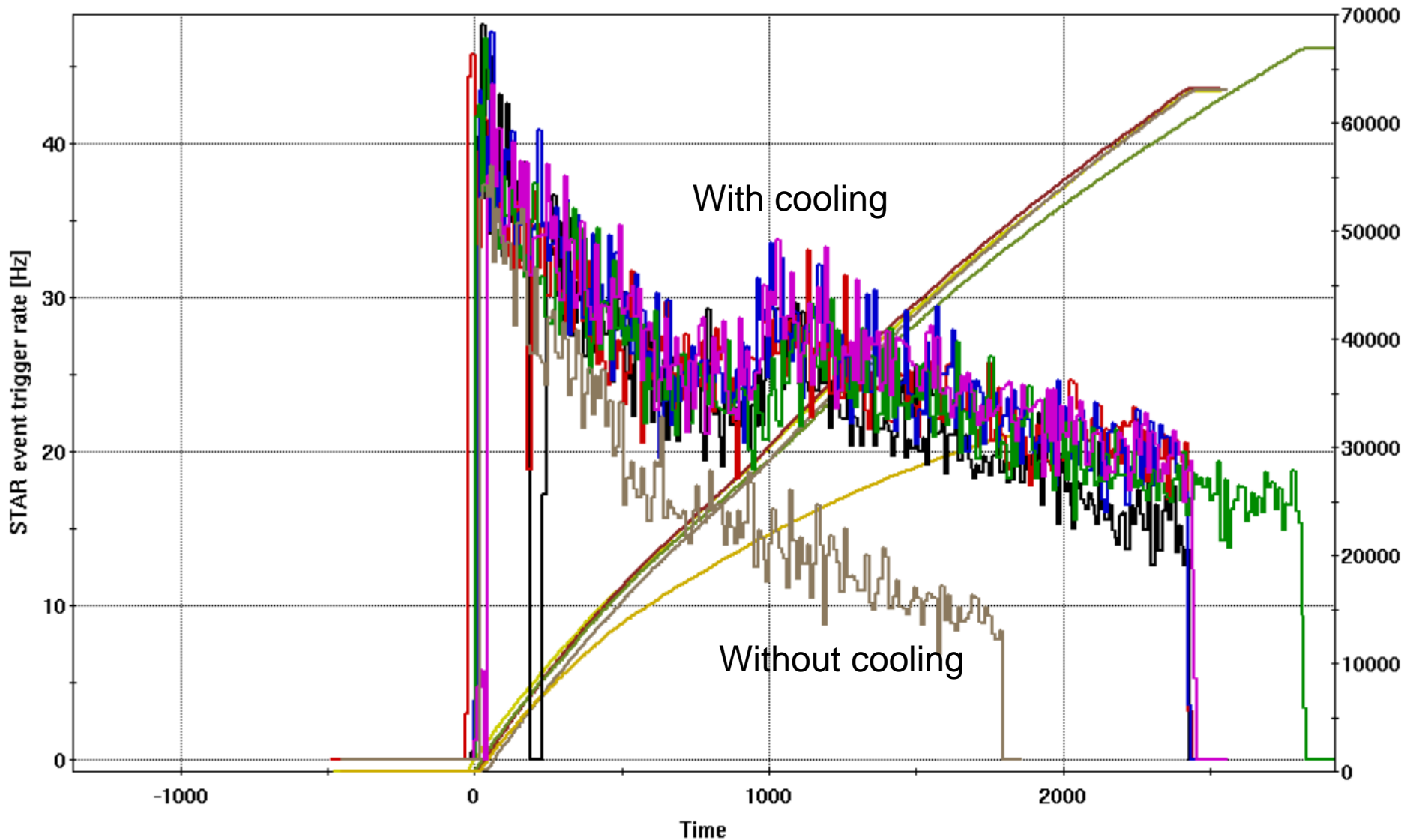
LEReC laser issues



Production stores for Physics over weekend (somewhat low ion intensities)



Production stores with cooling and higher intensity for Physics



- starEventTrigger:rate:26944 (D) (Y1)
- starEventTrigger:rate:26947 (D) (Y1)
- starEventTrigger:rate:26945_integ (Y2)
- starEventTrigger:rate:26948_integ (Y2)
- starEventTrigger:rate:26945 (D) (Y1)
- starEventTrigger:rate:26948 (D) (Y1)
- starEventTrigger:rate:26946_integ (Y2)
- starEventTrigger:rate:26954_integ (Y2)
- starEventTrigger:rate:26946 (D) (Y1)
- starEventTrigger:rate:26954 (D) (Y1)
- starEventTrigger:rate:26947_integ (Y2)

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** (very stable running for few days March 4-8)

Plans:

- Support LEReC running by MCR
- Establish 24/7 stable operation with cooling (all LEReC systems)