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# 25ns Machine Studies

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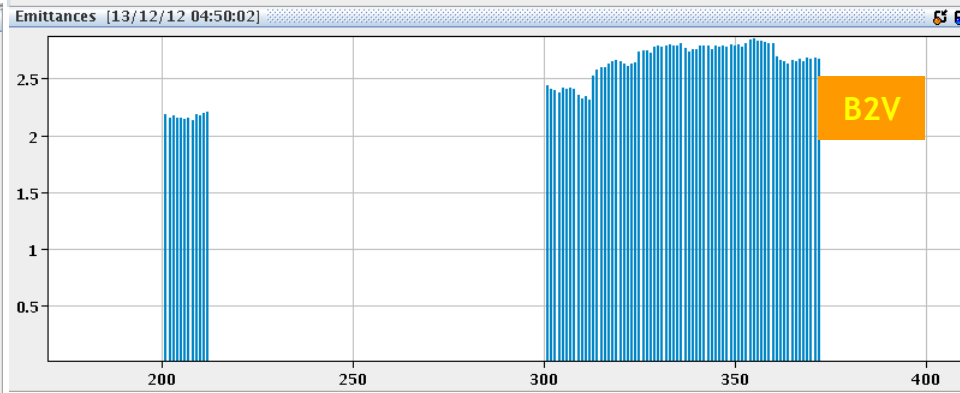
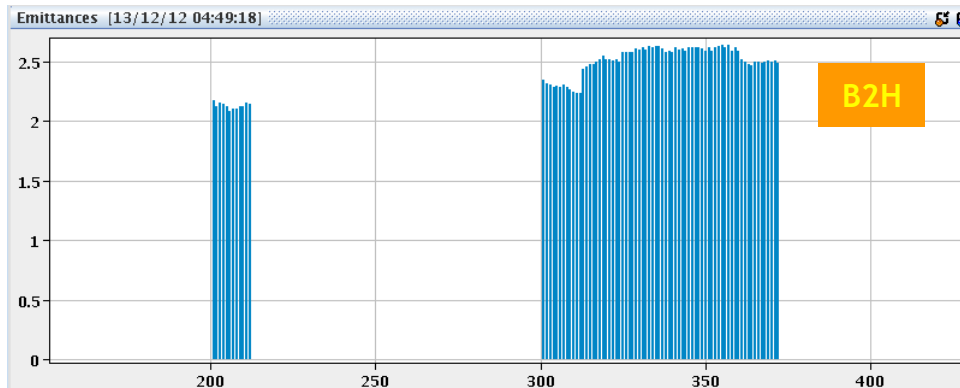
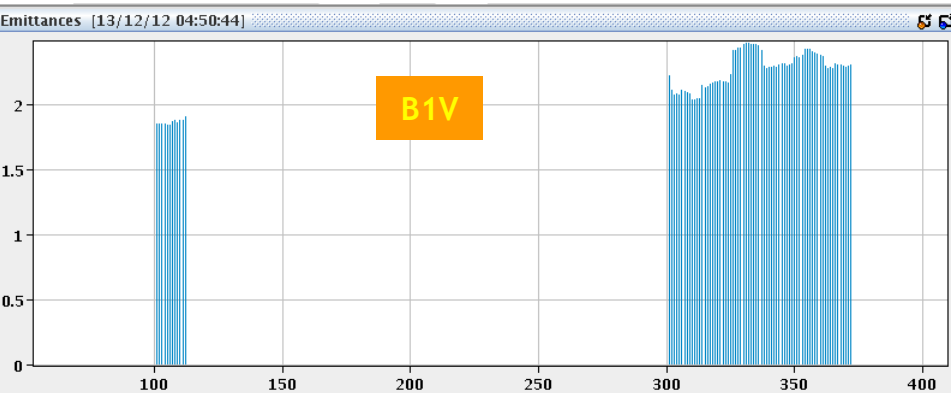
Machine Coordinators: M. Lamont, B. Holzer

T. Baer, Cryogenics, Operation, Vacuum teams and many others

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# First Beam of 25ns at 4 TeV/beam

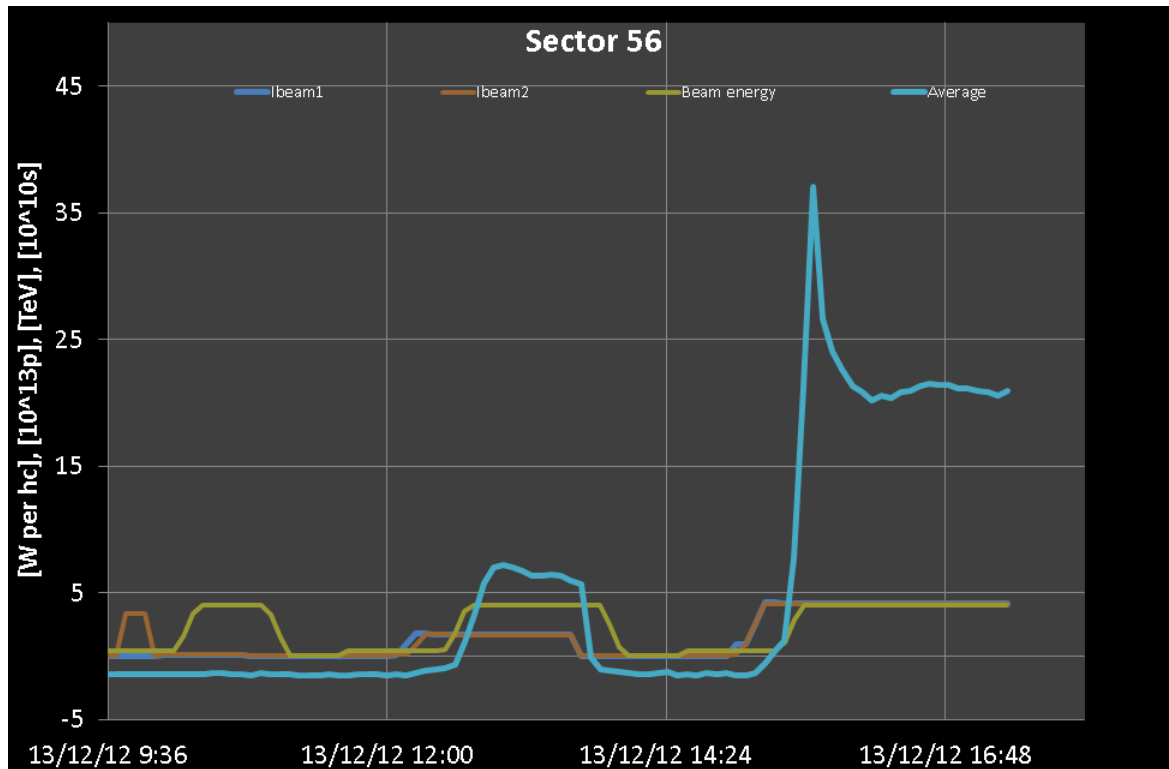
- Injected and ramped to 4 TeV 12+72 bunches
- $\sim 1.1 \times 10^{11}$  p/b



**$1.02 \times 10^{11}$  p/b in collision with  $\sim 3.1 \mu\text{m}$ .**

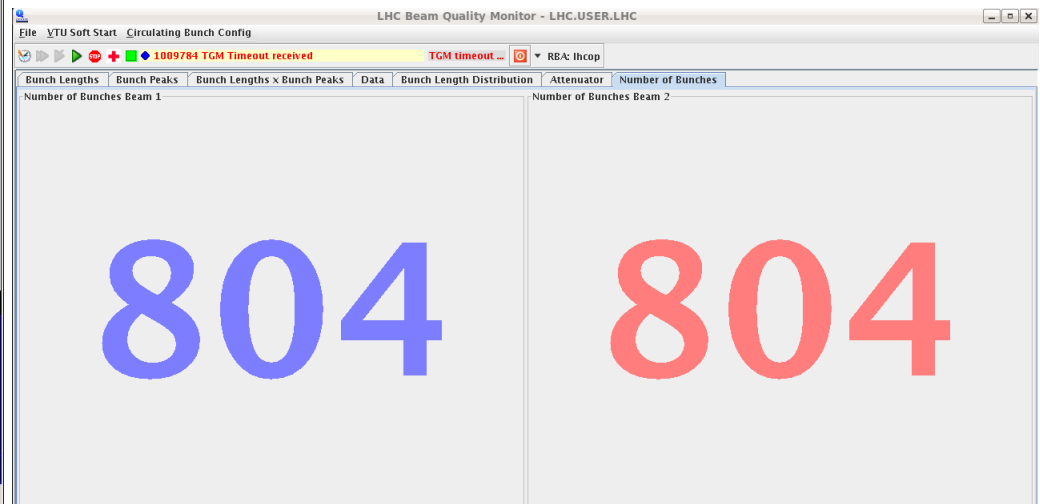
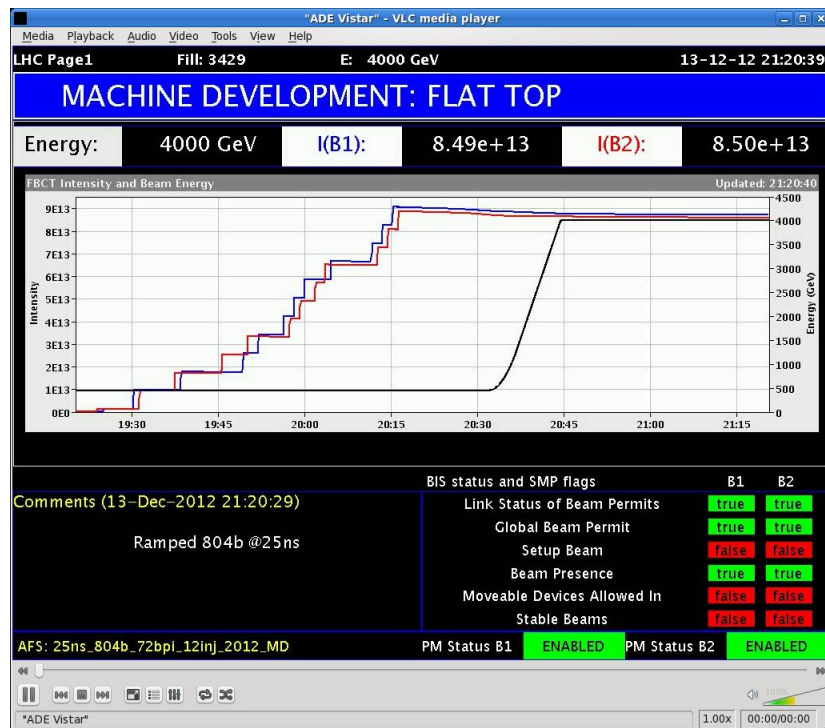
# 372 bunches at 4 TeV/beam

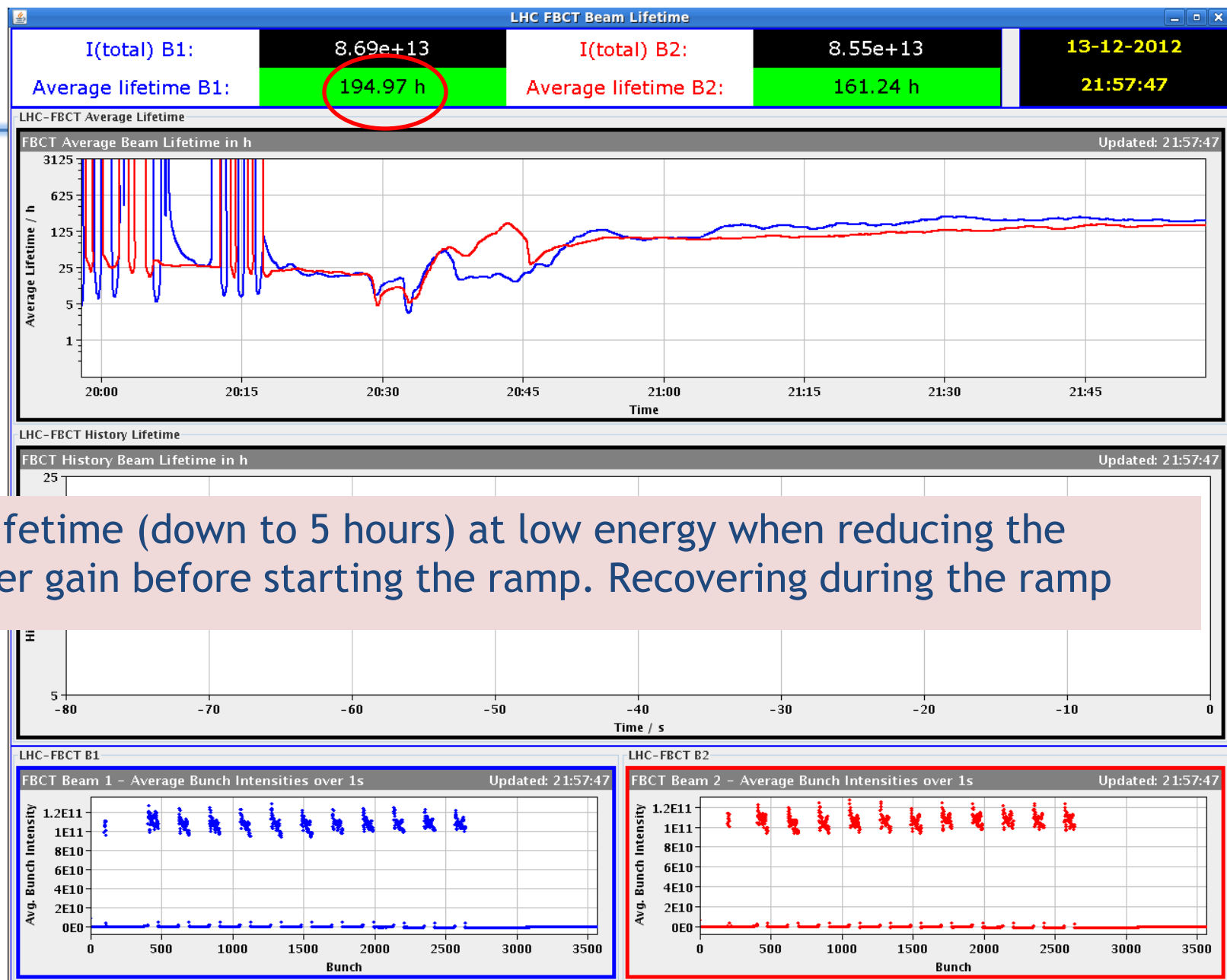
- 15:00 - 17:50 Ramp with  $12+5 \times 72 = 372$  bunches
- Kept at flat top for ~2 hours. Then dump to increase intensity. Spike occurring during the ramp starting at ~2 TeV when photoelectrons start to play a role.



# 804 bunches at 4TeV/beam

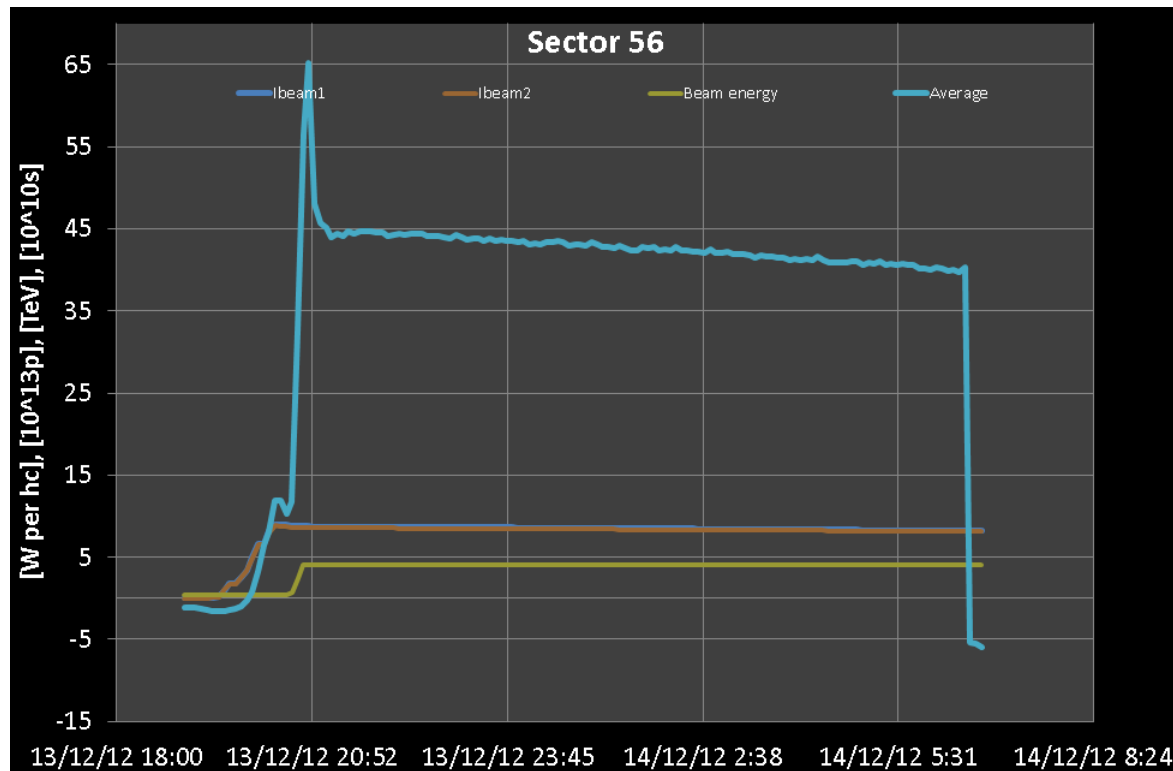
- 19:00-20:46. Filling with  $12+11 \times 72 = 804$  bunches and ramp. Filling in steps to allow cryo team to adapt regulation. A lot of work with loss of cryo start in two sectors during the ramp.





# BUT: Heat load

- Heat load not varying significantly (~ linear with intensity).



- With 50ns, 1374b:  $\approx 1.3$  arc UFOs per hour

- Fill 3428 (156b):

27 arc UFOs in 2.25 hours

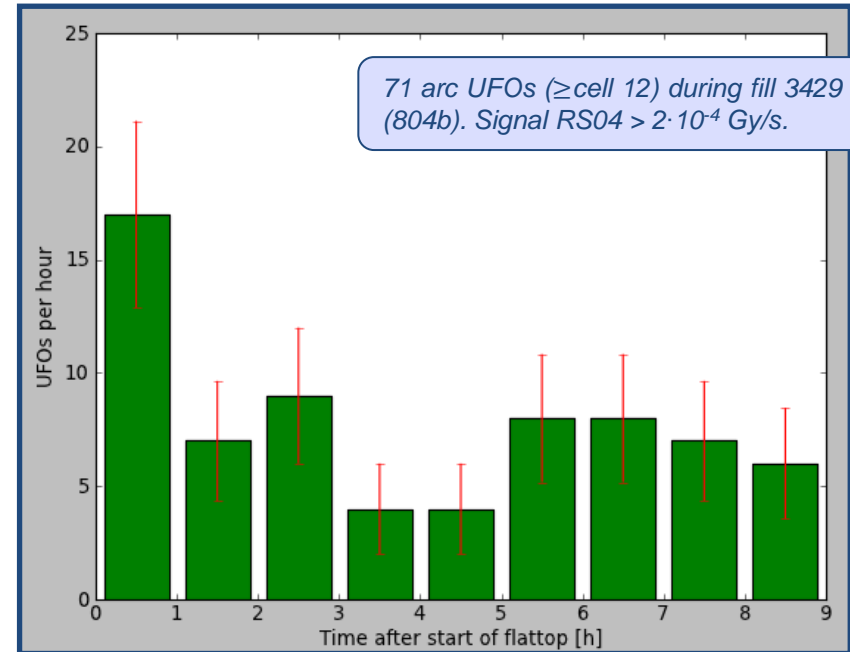
-> **12.0 UFOs per hour**

- Fill 3429 (804b):

**71 arc UFOs** in 9.75 hours

-> **7.3 UFOs per hour**

highest UFO activity in first hour.



- In fills 3428 – 3429:

**5 UFOs > 10% of BLM dump threshold**

Largest UFO: 42% of BLM dump threshold

## – Morning:

- **Loss map** at the end of squeeze and in collision (with 12 bunches)
- BCMS injection (12 bunches available on the same cycle)

## – Afternoon:

- Fill with 804 bunches

## – Night:

- Calibration fills at 450 GeV (72 bunches trains and 288 bunch trains)

## – Tomorrow: physics 25 ns provided loss maps understood

### Conclusion so far:

25ns will not be "a walk in the park".

50ns is still a valid alternative, so detectors should keep working on event pile up