

Run coordinator report for Week 17/2021 @ SEM

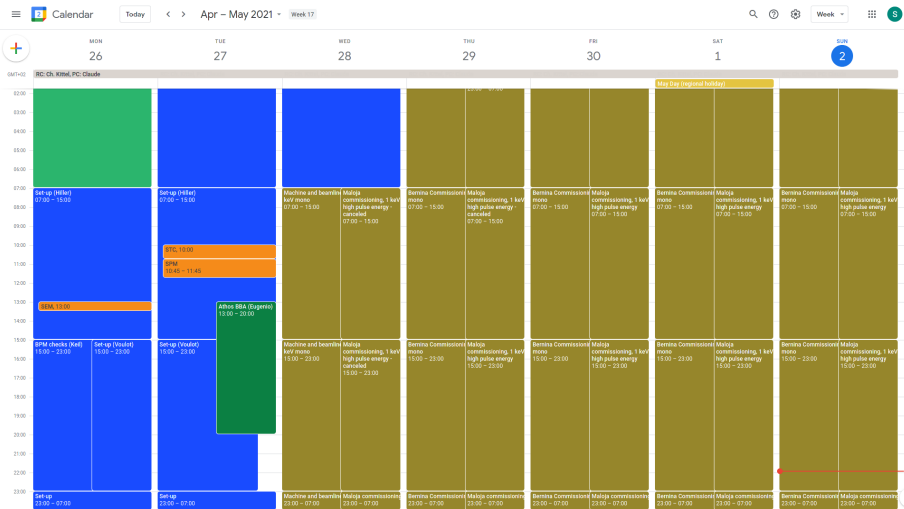
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03.05.2021

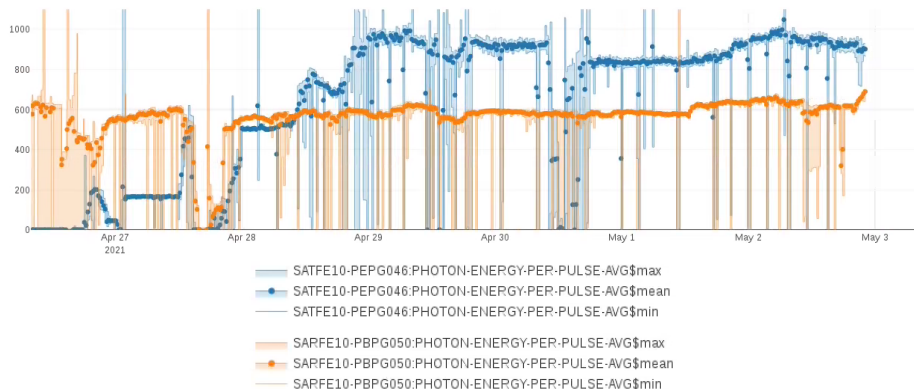
Overview

- 1 Schedule Week 17
- 2 Lasing plots
- 3 Rundown of the week
- 4 Issues
- 5 Stability problems
- 6 Athos gain curve
- 7 Conclusion

Summary of week 17 - Schedule



Summary of week 17 - Lasing in Aramis and Athos



Summary of week 17 - Set up days

Monday: [elog:19330](#) [elog:19347](#)

- Alcor and Mizar alignment on iris
- Systematic 2 Bunch setup, energy too low in BC1 & BC2
- RF delay adjustments to allow for better tuning of bunch 2
- Putting S20CB03 RF station back online and scaling Athos magnets to this energy
- Optimizing lasing and losses in Athos
- Shift to recalibrate Athos and Aramis BPM's (beam angles + scaling factors)

Tuesday: [elog:19356](#)

- DRPS tests in the injector
- Bandwidth reduction in Aramis: 1.75 -> 1.3 per mil
- Athos undulator orbit BBA in less than one shift
- Athos 500 μJ @ 1 keV, optics optimization in common part often anti-correlated with Aramis lasing!!

Summary of week 17 - Photon delivery days

Wednesday: [elog:19382](#)

- Synchrotron radiation monitor set-up for 2 bunch established
- Aramis: pointing correction and photon delivery 600 μ J @ 11.2 keV
- Athos: beam optimization 1 mJ @ 1 keV, optics hutch not ready

Thursday: [elog:19396](#)

- Aramis: photon delivery and BW re-optimization: 1.4 per mil
- Athos: manual tuning to reduce losses (for 100 Hz) and re-optimization of lasing

Friday: [elog:19417](#)

- Aramis: photon delivery
- Athos: photon pointing correction, Athos quad mover limit switches reduce success

Weekend:

- Photon delivery on both beam lines
- Manual optimization and some PSICO

Summary of week 41 - Issues

RF issues:

- RF energy too low for bunch 2, RF delays needed adjustment to establish a stronger slope between bunch 1 and 2

Controls issues:

- Athos undulator quadrupole movers have issues with their limit switches -> reducing greatly the capacity for pointing correction
- Friday: multiple controls issues, possibly related to Databuffer problem
- Various controls issues (BSread, snapshot, magnet IOCs) through the week
- Multiple DRPS alarms due to detector 102 and 802 communication problems
- SATUN20 undulator controls unresponsive again
- Some confusion due to changes in the sensor list of Athos undulator orbit feedback

Vacuum issues:

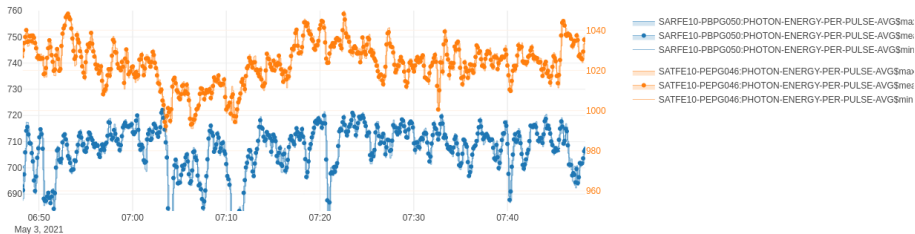
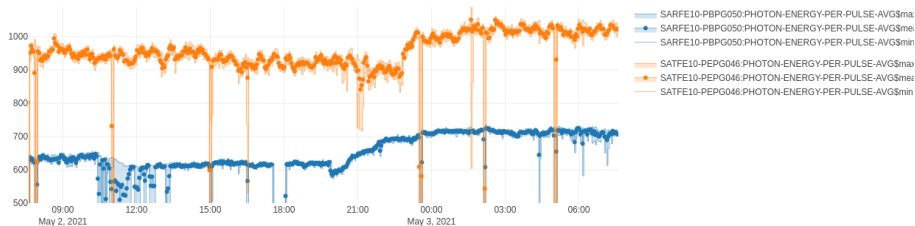
- Vacuum interlock in Athos Front End, due to installation work in optics hutch?

Stability problems part 1

All working days: fluctuations of lasing

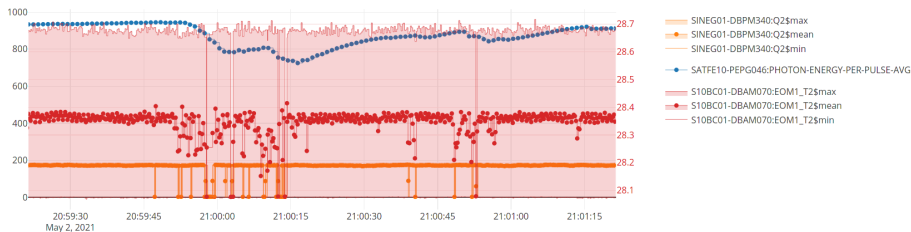
① $\pm 40 \mu\text{J}$ $T \approx 40 \text{ min}$, only on Athos

② $\pm 15 \mu\text{J}$ $T \approx 2.5 \text{ min}$

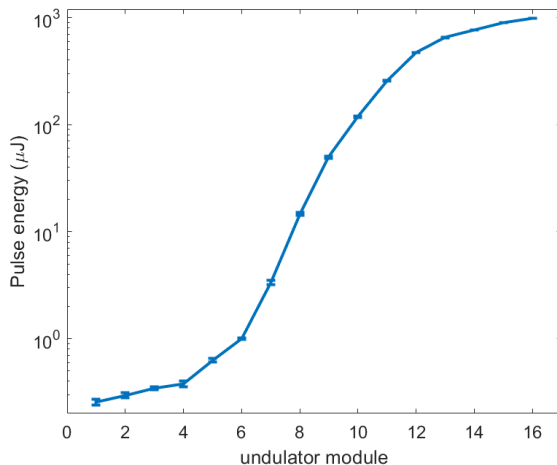


Stability problems part 2

- Aramis Bandwidth creeping up over the weekend 1.4 -> 1.55
- Athos arrival time fluctuations:



Athos set up - gain curve



- Gain curve (Thursday): all 16 undulator modules contributing! 1 mJ @ 1 keV

- Stability is still a problem and need further investigation, especially for Athos operation
- Bunch 2 energy and compression feedbacks should be incorporated (started testing already this morning)
- Aramis Bandwidth not yet optimized to its full potential
- First Athos phase matching tests show positive results, MD shift is being scheduled
- Good support from Beam Dynamics throughout the week