

# SwissFEL Operation – Run Coordinators' Report Week 27/2021

- **Week overview**
- **Aramis and Athos setup**
- **Issues**

Thomas Schietinger (Mon–Fri), Christoph Kittel (Sat–Sun)  
BD support: Eduard Prat  
SEM, 12 July 2021

# Calendar

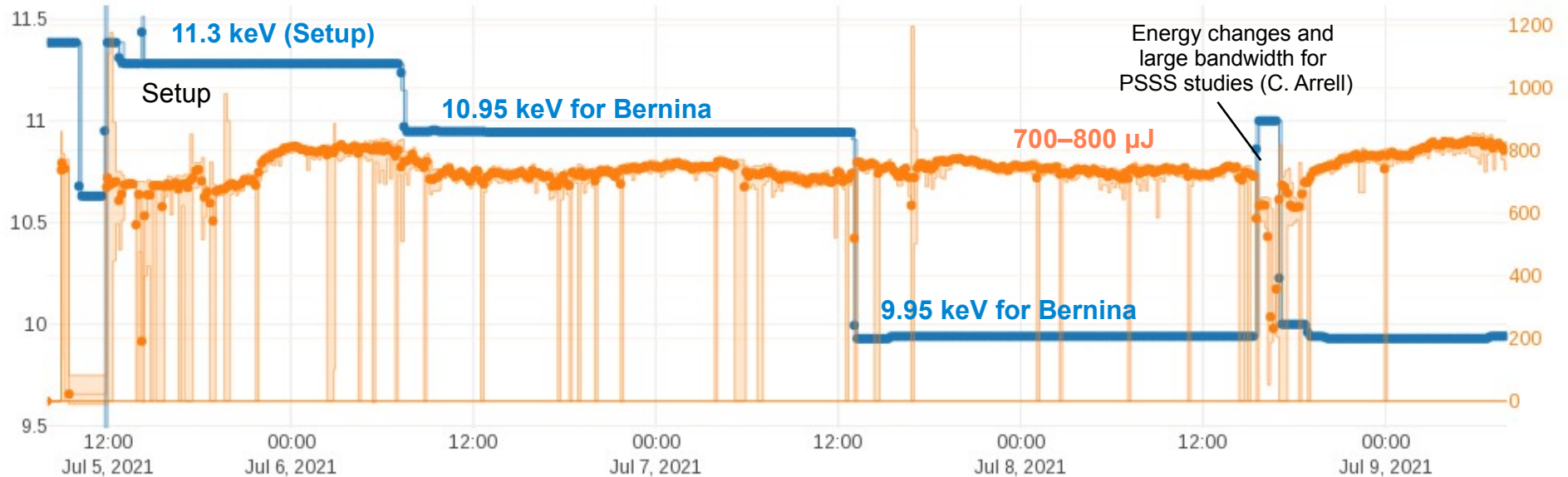


# Week overview (Aramis)

● Photon energy (keV)

● Photon pulse energy ( $\mu\text{J}$ )

Mon, 05-Jul, 08:00 – Mon, 12-Jul, 08:00

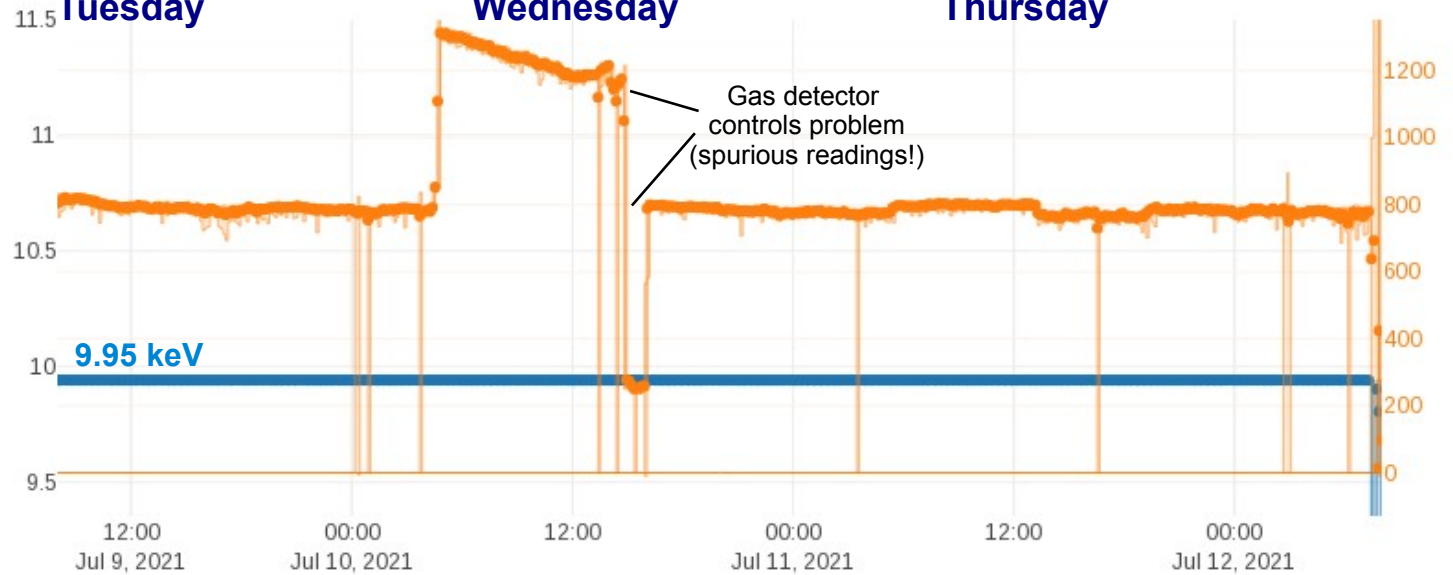


Monday

Tuesday

Wednesday

Thursday



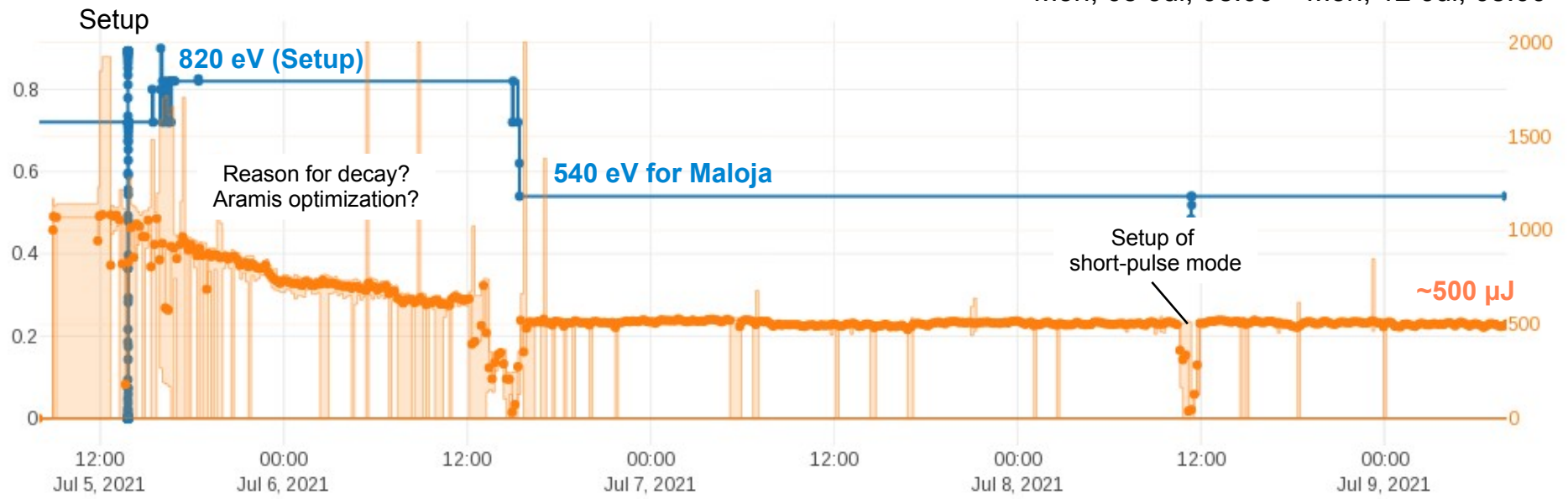
Friday

Saturday

Sunday

# Week overview (Athos)

● Photon energy (keV)  
● Photon pulse energy ( $\mu\text{J}$ )  
Mon, 05-Jul, 08:00 – Mon, 12-Jul, 08:00

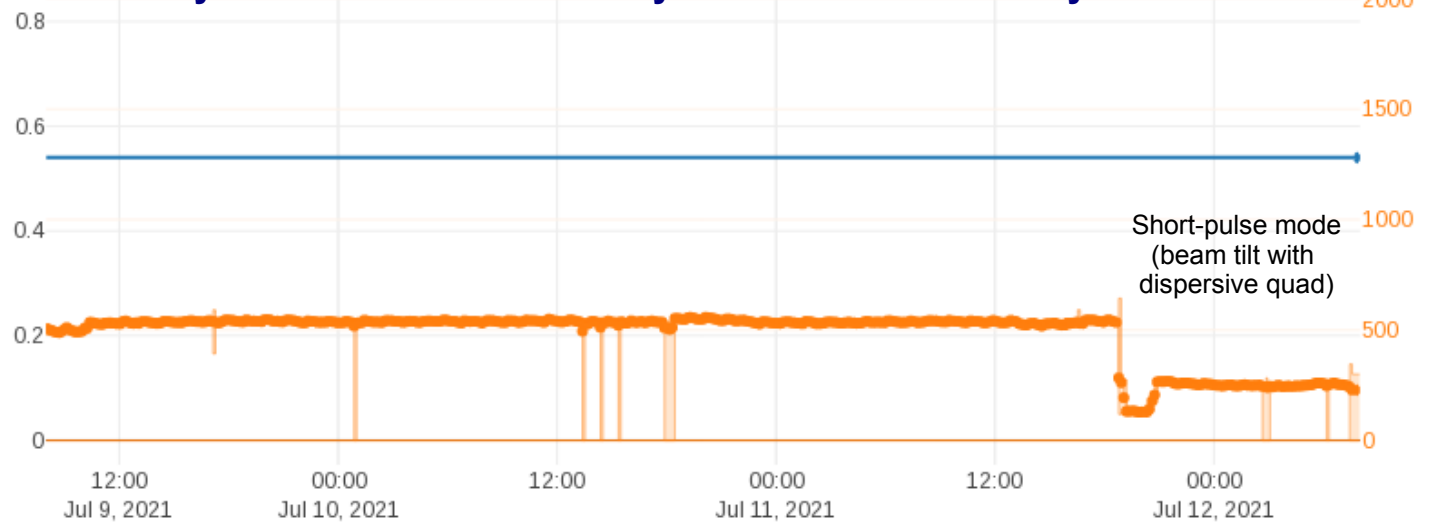


Monday

Tuesday

Wednesday

Thursday



Friday

Saturday

Sunday

- **Aramis setup:**

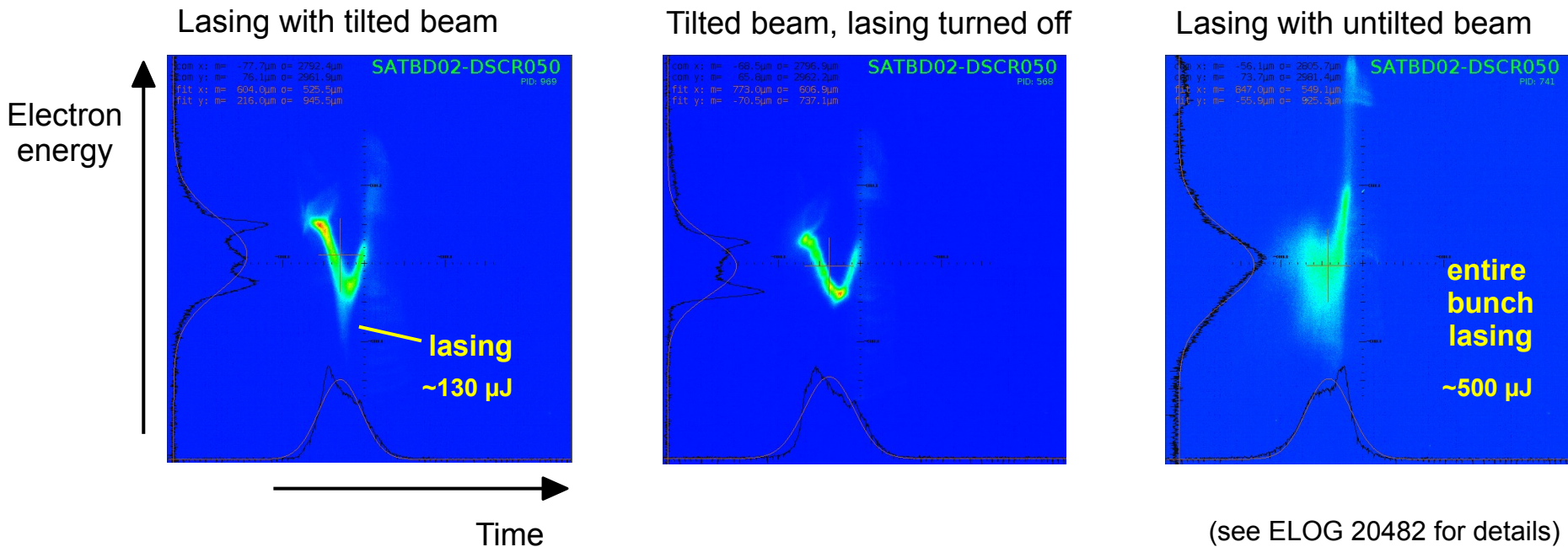
- Photon energy already at 11.3 keV
- Standard checks...
- BW optimization: dechirper, compression setup (X-band amplitude), phase shifters
  - Get down to about 1.55 per mil at 700  $\mu$ J
  - Later in the week closer to 1.7 per mil with 800  $\mu$ J (similar spectral density)
- Tuesday morning energy changed to 10.94 keV
- Large bandwidth for PSSS studies (C. Arrell): at 10 keV little success with dechirper and off-crest acceleration in linac-3... in the end change compression in BC1 to reach about 2.5 per mil bandwidth (Athos not affected thanks to separate compression feedback on bunch 2).

- **Athos setup:**

- Monday: Setup with standard bunch length at 820 eV, loss mitigation with dechirpers (can run at 100 Hz!)
- Tuesday: Move to target energy of 540 eV
- Thursday: establish setting giving shorter photon pulses with beam tilt from dispersive quadrupole (next slide).

# Short pulse for Athos

- Short photon pulses by horizontally tilting the beam with a dispersive quad in SATCL01.
- Reduction of photon pulse length (and pulse energy) by a factor five.
- Verified with post-undulator dechirper:



(see ELOG 20482 for details)

# Issues

## Instantaneous events:

- Wednesday, 5:00: S10CB09 takes almost an hour to recover
- Wednesday, 16:45: unexplained drift in photon energy caused by drift in electron energy caused by something upstream (not fully understood yet).
- Thursday, 14:30: BLM IOC needed a reboot – short interruption of beam in accordance with users.
- Saturday, 4:40: gas detector controls problem leads to spurious readings. Several hours until fixed (operators not sure which pikett to call).
- Saturday, 14:00: losses in SATDI01 necessitate an adjustment of the Mizar arrival time.

## Other problems:

- Instability in Mizar gun laser – fixed by capillary adjustment on Tuesday.
- Controls problem with undulator K values (discrepancy between set and read values...) – under investigation.
- Sometimes increased losses in Athos when Aramis bunch is not present.
  - Still preferred over Aramis stopping Athos...