Management News

A. Pellegrino, U. Uwer, Feb-27-2023

YETS activities:

Work on services & infrastructure:

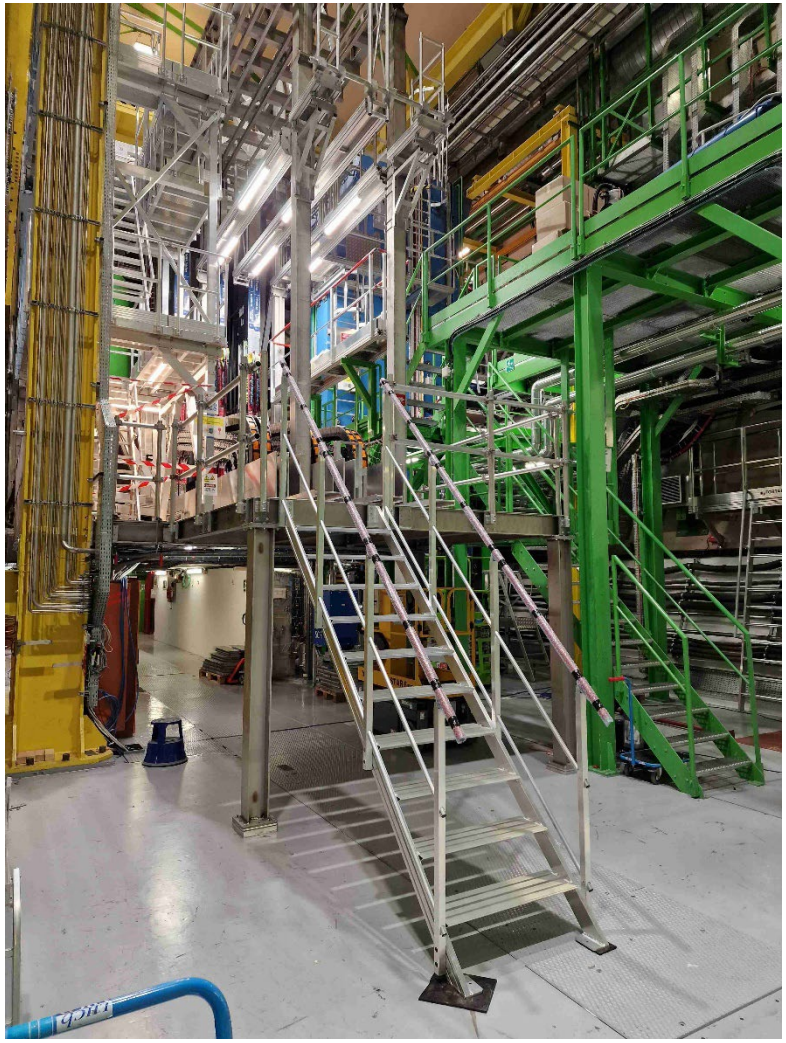
- New platform (accessibility) (see talk by Sune)
- Work on (SiPM) cooling plant
- Water filter cleaning
- Dry air – maintenance
- Exchange of broken FEBs
- Fix of broken fibres
- BCAM repairs and alignment

Detector photogrammetry & survey: (Blake, Maria)

- Needs access to magnet area
  → delayed by Velo issues
  → now interference w/ unexpected repairs
  (first results: see talk by Dimitrios)

Unexpected repairs:

When cooling down on Thu heating wire shorts have been observed for 2 C-frames – bad!!



YETS activities: DAQ & RO issues

List presented at debriefing meeting in December:

- Investigation and understanding of the stability of coarse/fine time alignment: spot potential SciFi specific problems
- BEAM TI SCAN for fine time alignment has problems since September → survived by doing 32 single step runs, instead of single run w/ 32 steps (we can debug now with LIS and we need continued help from Online)
- Complete the full digital chain timing optimization by using FPGA_PRBS/ PACIFIC_BER scans.
- Long BER test with pattern injection for the whole detector is still missing (>8h): one of the first things in order to understand various TELL40 decoding errors.
- Investigation of stability of data quality - reference results of the data link quality from long BER is the first step!
- Threshold calibration using Light Injection System (LIS) not yet done
- Debugging of the Cluster Board FPGA firmware not yet completed: some biasing/bugs in cluster algorithm already found – need fix/implement
- Validation of the TELL40 firmware for beam pipe modules (FV format) just started: documentation in the TELL40 flow and in the TFC/WinCC system would be helpful

Timing issues

Slide prepared by Preema & Snow

Fine timing scans:

- Reminder: data-taking with ‘beam timing scan’ activity not working since September 2022 - jumps in bxid seen at various scan steps
- Problem reproduced with light injection system - debugging without beam during this YETS (Olivier, Ulisses, Guillaume)
- BXID jumps not seen with LIS tests using the **most recent TELL40 firmware** prepared by Guillaume, to be repeated with the full detector, and eventually with beam

Timing instabilities:

- Time alignment shifts wrt beam after sol40 power cycle or reprogramming, and from LHC clock losses
- Progress made towards fixed latency firmware (GBT v6); Online experts have been using the SciFi to test new sol40 fw versions

Timing & Data transmission

Slide prepared by Preema & Snow

All types of timing scans (FPGA PRBS/PACIFIC BER) done: (see talk by Lex)

- We can use a common setting for the whole detector

Data transmission quality:

- first long BER runs successfully taken last week,
  could be used to confirm errors in transmission
- Investigating the option to use PRBS in loopback between the sol40 and the master board as well

Other issues

Successful first FV format validation on detector: (see talk by Olivier)
small scale, free running with data pattern injected

Front-end controls:
split controls projects between more machines to improve timing

Implementation of register write/read in GbtServ by Clara; should be particularly helpful in reducing time taken for a full threshold scan (~7 hours in 2022)

Validated all types of calibration signals (light and charge injection)
LIS mapping check complete for the whole detector, including the final 20 FEBs installed after Cframe commissioning - ready for sCurves from injected signals
(see talk by Jan-Marc)

Optimized version of Recipe Creator to come:
- more flexible and robust tool

Update to software safety system ongoing:
additional alarm and action notifications, detailed issue tracking and reporting, user and expert panels

CAEN line drop recovery for SiPM bias channels implemented

Debugging of bias in cluster algorithm is progressing (see talk by Sophie)

YETS activities: DAQ & RO issues

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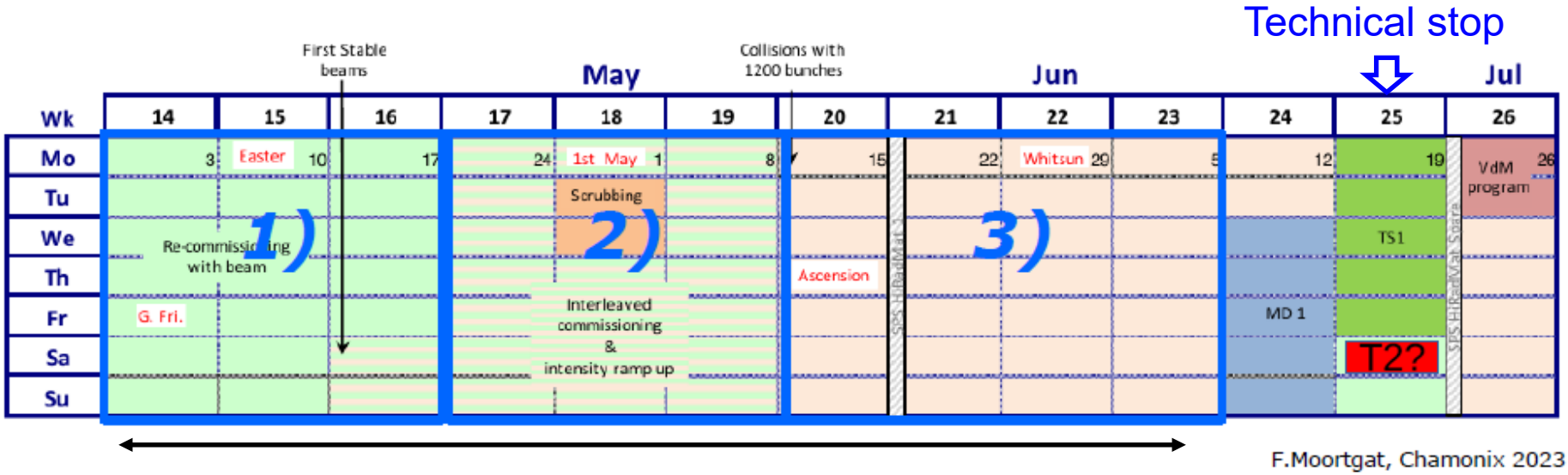
- Investigation and understanding of the stability of coarse/fine time alignment: spot potential SciFi specific problems — progressing well
- BEAM TI SCAN for fine time alignment has problems since September → survived by doing 32 single step runs, instead of single run w/ 32 steps (we can debug now with LIS and we need continued help from Online) — progressing well
- Complete the full digital chain timing optimization by using FPGA_PRBS/ PACIFIC_BER scans. — done
- Long BER test with pattern injection for the whole detector is still missing (>8h): one of the first things in order to understand various TELL40 decoding errors. — On-going
- Investigation of stability of data quality - reference results of the data link quality from long BER is the first step! — On-going
- Threshold calibration using Light Injection System (LIS) not yet done — On-going
- Debugging of the Cluster Board FPGA firmware not yet completed: some biasing/bugs in cluster algorithm already found – need fix/implement — understood bias
- Validation of the TELL40 firmware for beam pipe modules (FV format) just started: documentation in the TELL40 flow and in the TFC/WinCC system would be helpful — On-going

Advancements in detector understanding

- Pedestal runs (being performed)
- LIS and internal charge calibration (see talk by Jan-Marc)
- How to best time-align the detector? (see talk by Xehua)
- Data Quality (see talk by Elisabeth)
- Photogrammetry, survey and BCAMs (see talk by Dimitrios)
- Software alignment & bias from clustering. (see talk by Sophie)
- Reconstruction (see talk by Jessy)
- Usage of SciFi as lumi counter (talked had to be canceled)
- Effect of radiation on SiPMs (see talk by Federico)

From the Technical Board:

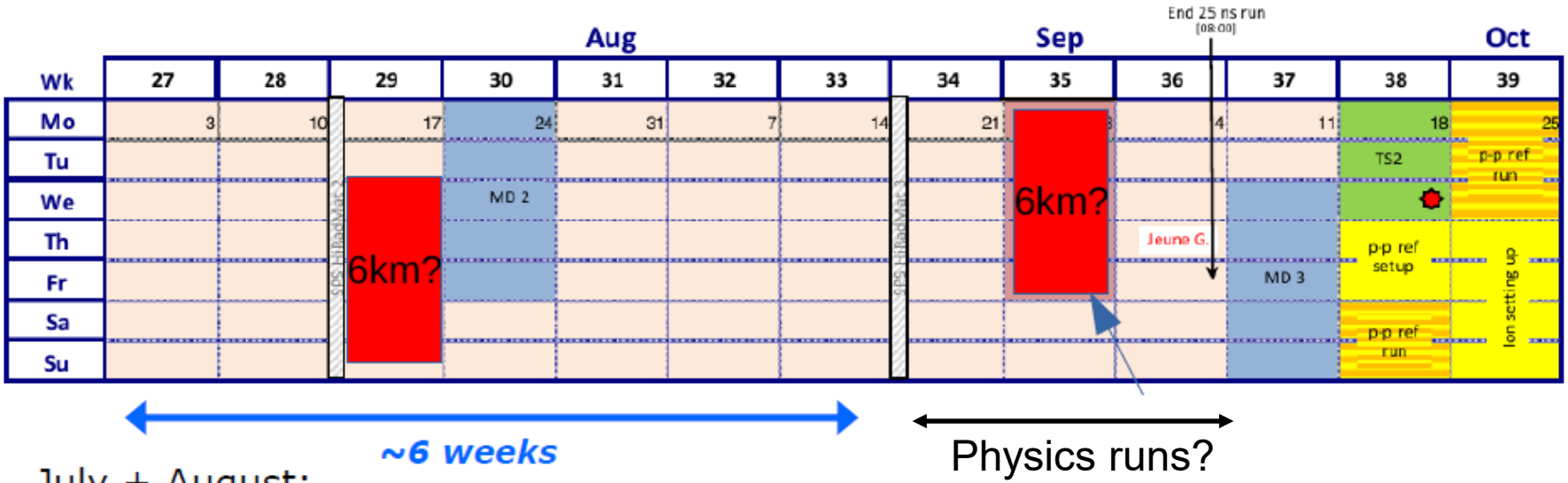


F.Moortgat, Chamonix 2023

Subdetector commissioning w/ regular global RO tests

1) 25 Mar – 20 Apr: LHC commissioning with beams
   - Handful fills with stable beams
   - ➢ Request: how many fills at 450 GeV are needed for VELO ?
2) 20 Apr – 15 May: Interleaved commissioning and intensity ramp-up
   - Risk that many fills with Stable Beams are at night
   - ➢ Request: how much time is needed for LHCb subdetectors? (How hard we need to push?)
3) 15 May – 14 Jun: first period pp physics production
   - Ideally, fully dedicated to sub-detectors recommissioning interleaved by periods in global

From the Technical Board:



July + August:

- Shift emphasis towards global commissioning

Attention:
Envisaged is to run w/ partially closed VELO (~10 mm).
But, depending on VELO motion system we might need to run w/ fully open VELO.

Niels estimated the integrated luminosity for 2023: 0.5 fb^{-1}
(I insisted not to age SciFi unnecessary, i.e. run at very low μ value per default)

Some ToDo's to be tackled in future

- **Usage of T-tracks for systematics studies:**
  It is not clear how far the VELO can be closed in 2023.
  We need used T-stations tracks for our systematic studies!
- Launch a **program to monitor the fibres aging** of beam pipe-modules:
  For the OT we performed regular in-situ monitoring measurements.
- Detailed **spare inventory** (Uli has started to collect data)
- **SciFi-performance paper**.

New SciFi Management

Project Leader:
Pascal Perret

Deputy PL:
Blake Leverington

Please support Pascal & Blake the same way you did w/ Antonio and myself.

All the best to Pascal & Blake.

At the end

Thank you.