

Silicon Preparation for ~~2020~~ / 2021 - Status Update

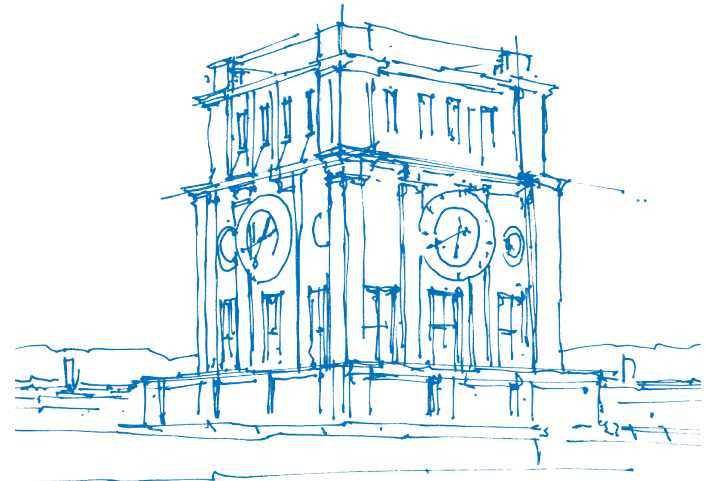
Update

Christian Dreisbach

Technical University of Munich
Physics Department

COMPASS Technical Board Meeting

~~September 1st 2020~~ *Jan. 19th 2021*
CERN



TUM Uhrenturm

Goal of the 2020 Dry Run / Preparations

Full operational Silicons

About 2.5 years of storage requires a detailed testing and possible repairs of infrastructure.

• Testing of Cryogenic System:

- Cryo-leaks challenging - repair time (~2 days)
- Full test of vacuum equipment
- Full setup of cooling system

*Main goal of
Dry Run ☹️*

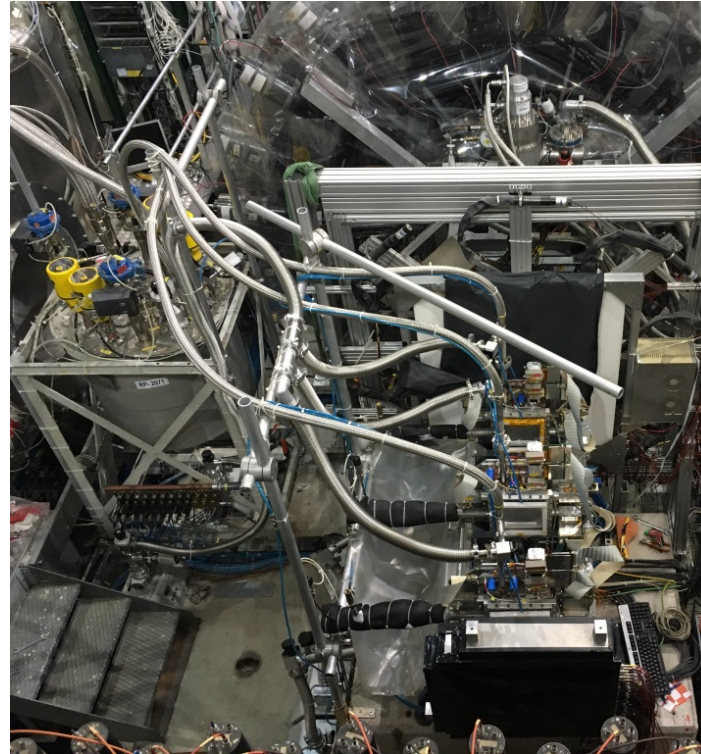
• Readout System *(partially done)*

- Basic tests already performed during 2019 (ADCs)
- Test of APVs and infrastructure Repeater Cards

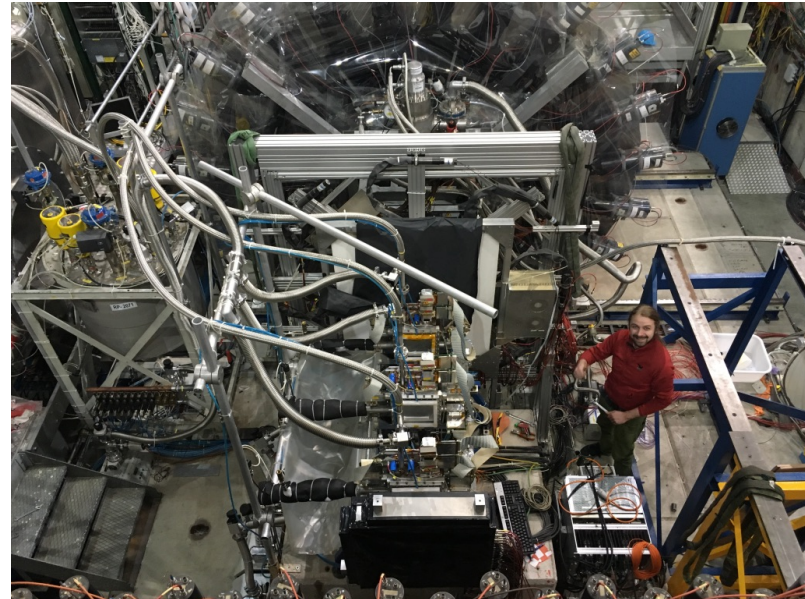
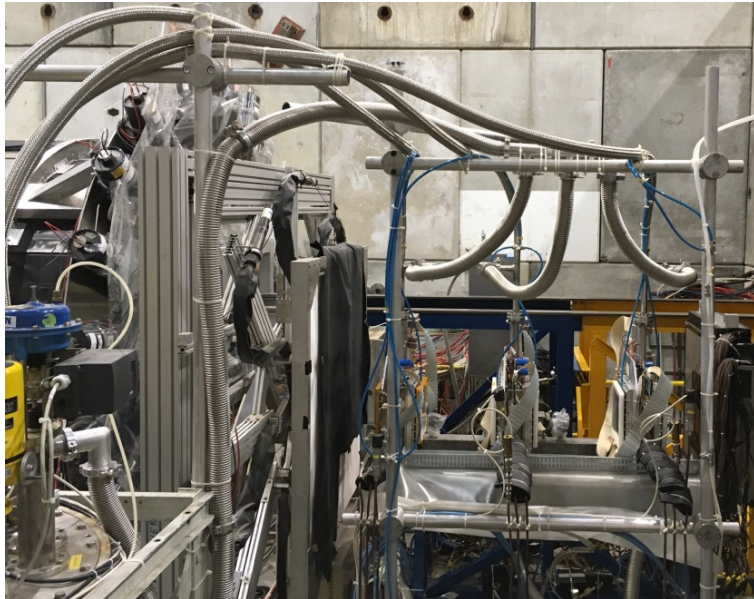
• Preparation for 2021 Run

- Major work can be done in 2020 → *not possible*
- Movement of equipment in final position for 2021

*↳ Maybe: Basic Test with single stations
next to final position
=> full setup after target loading (20.4.2021)*



Silicons at Target Location - 2016 / 2017



Silicons at Target Location - 2020 (ongoing)

General Infrastructure

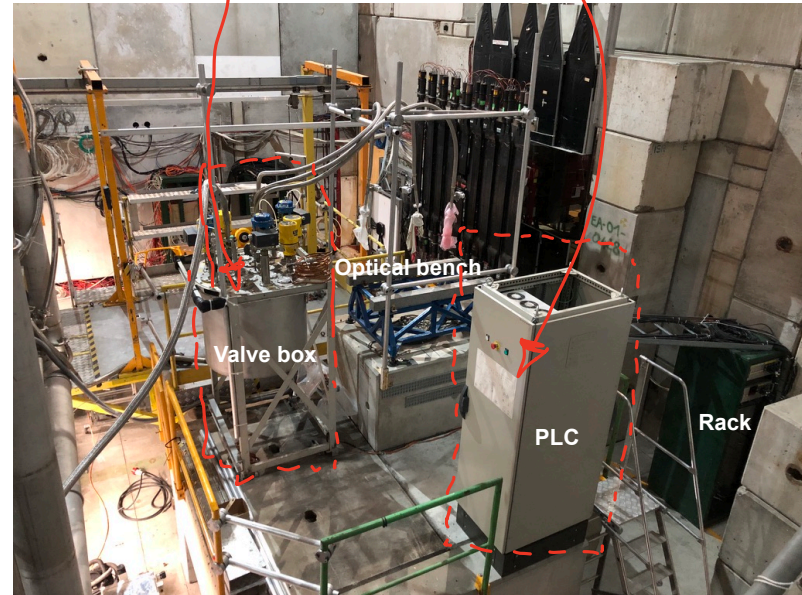
- Valve Box and PLC in place → *Redo*
- Main LN₂-transferline prepared ✓
 - Currently connected to target ✓
- Exhaust transferlines installed ✓
- Station transferlines prepared *Redo*
- Scaffolding mounted ✓
- Optical bench in place ✓
- New power supply rack installed ✓

Cabeling

To Do

- ADC fibers from Saleve side
 - Refurbishment of fibres planned (ongoing)
- ADC low-voltage from new rack
- APV low-voltage from new rack:
 - Requires CAEN from e-pool (before dry-run)
- High-voltage from new rack
 - Items ready to be installed

Moved to Clean Area



List for Preparations and Testings (still to do)

Electronics Pool:

- 1x CAEN SY1527 with 8x A1518A Module (incl. 2x spares)

Vacuum Pumps (5 days):

- 3x (Silicons) + 1x Valve Box + 1x Station Transfer Lines + 1x Main Transfer Line
 - Maintaining of Vacuum Pumps (Exchange of Membrane and Fluid Reservoir)
 - Testing of Vacuum Pumps (6x + 4x Spares)

Vacuum Gauges (2 days):

- 13x Vacuum Sensors + 6x Replacement Cells
- 3x (Silicons) + (3x backup cell), 1x Station Transfer Lines, 1x Valve Box, 1x Main Transfer line
- Testing of Vacuum Sensors and Vacuum Cells

High Voltage Capacitors (1 day):

- 12x for Silicons (4x per Repeater Cards)

Vacuum Tests (5 days):

- Replacement of Window O-Rings and Vacuum Test
- Vacuum Test of Stations
- Vacuum Test of Station Transfer Lines

Testing and Preparation of all required components

Total: **~7-14 days**

List for Installation

☑ Preparation of Location (1 day):

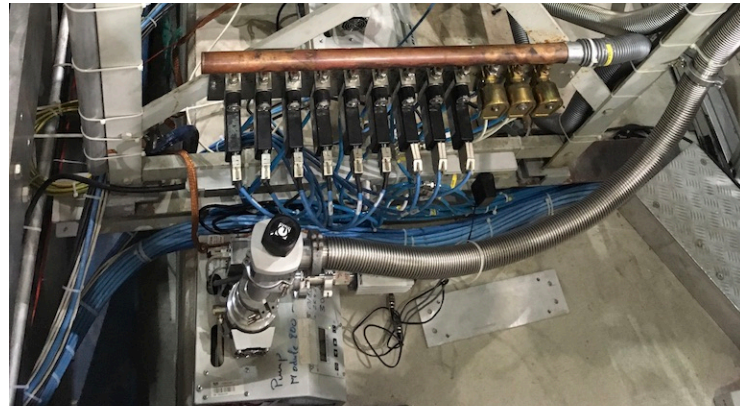
- ☑ Concrete Blocks and Optical Bench in place, scaffolding, rack, PLC
- ☑ Power, LAN, nitrogen gas

+ 2-4 days

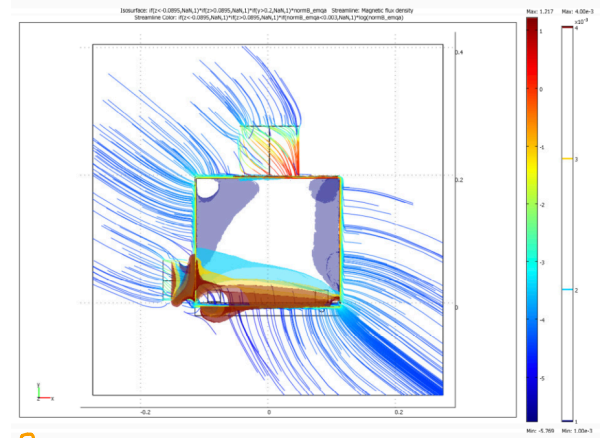
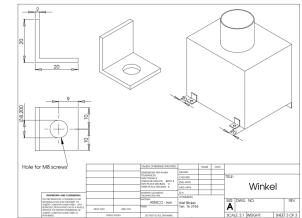
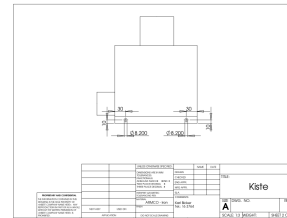
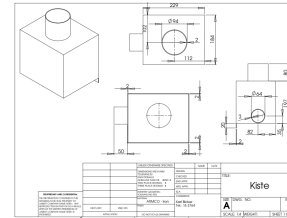
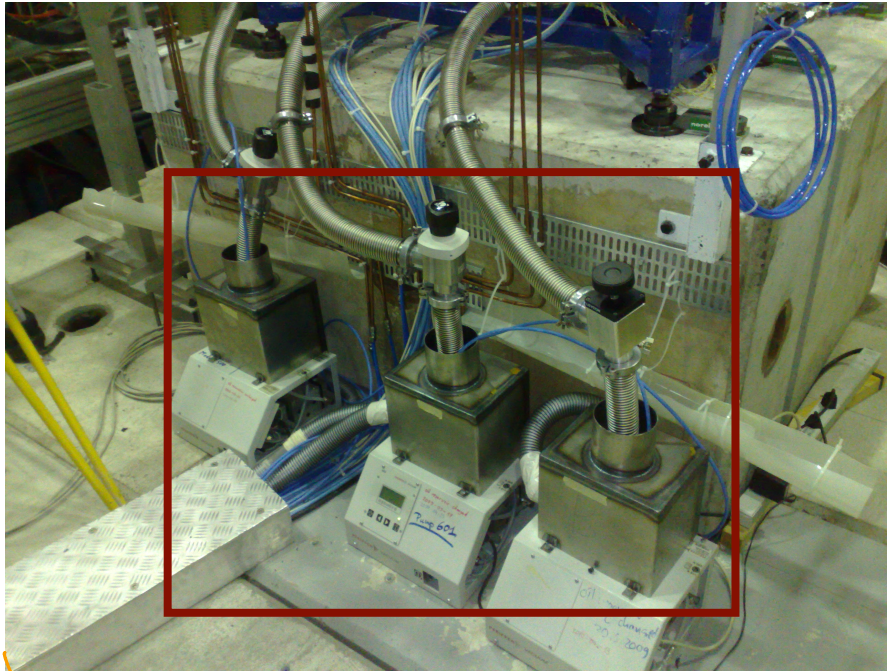
☐ Valve Box and Cooling System (2-4 days):

- ☐ Installation by Saclay (Jean-Yves and his Team)
- ☐ Requires: Power and pressurised Air for Valves
- ☑ Connection: Input and Exhaust Pipe Transferline
- ☐ Connection: Pressure Sensors, Safety Valves
- ☑ Connection of Main Transfer Line (3-5 people required!)
- ☑ Nitrogen Circuit for Stations

Moved
↓
Reworked
PLC System
↳ Testing
check
etc..
required
~ 1 week



Missing - Magnetic Shielding



skiff!

Not found yet 4x (stations + valve box):

- Checked locations: Clean Area, 892 storage / room in basement, 888 barrack (Munich/SciFi)
- Charly does not remember other places
- Search/Rebuild/Alternative? → *Drawings sent to Stefano - Any News?*

Summary

- **Goal of the test run 2020:**

- Commissioning of readout system — *only ADC tested in 2019*
- Commissioning of cooling system — *No!*
- ~~Fully operational Silicon detectors ~1 week before dry run start (and operational during dry run)~~

- **Time scale:**

- General preparations / testing: 7/14 days
 - Setting up Silicon detectors: 0/5 days
 - Commissioning of detectors and cooling system: 0/7-14 days
- *7-14 days (flexible)*
 - *Cabeling/Connecties 5 days*
 - *7-14 days dep. on PLC and problems (in place)*

- **Planning for data taking 2021:**

- Think about smart movement and single steps to switch to beam position → *Pre-Test of PLC (?)*
 - Stations have to be completely disconnected (readout, cables, pipes)
 - Infrastructure removed (scaffolding, optical bench, concrete blocks)
 - Minimal time estimate for moving existing setup in target location: 1-2 weeks
 - On-call planning in case of emergency target-removal?