



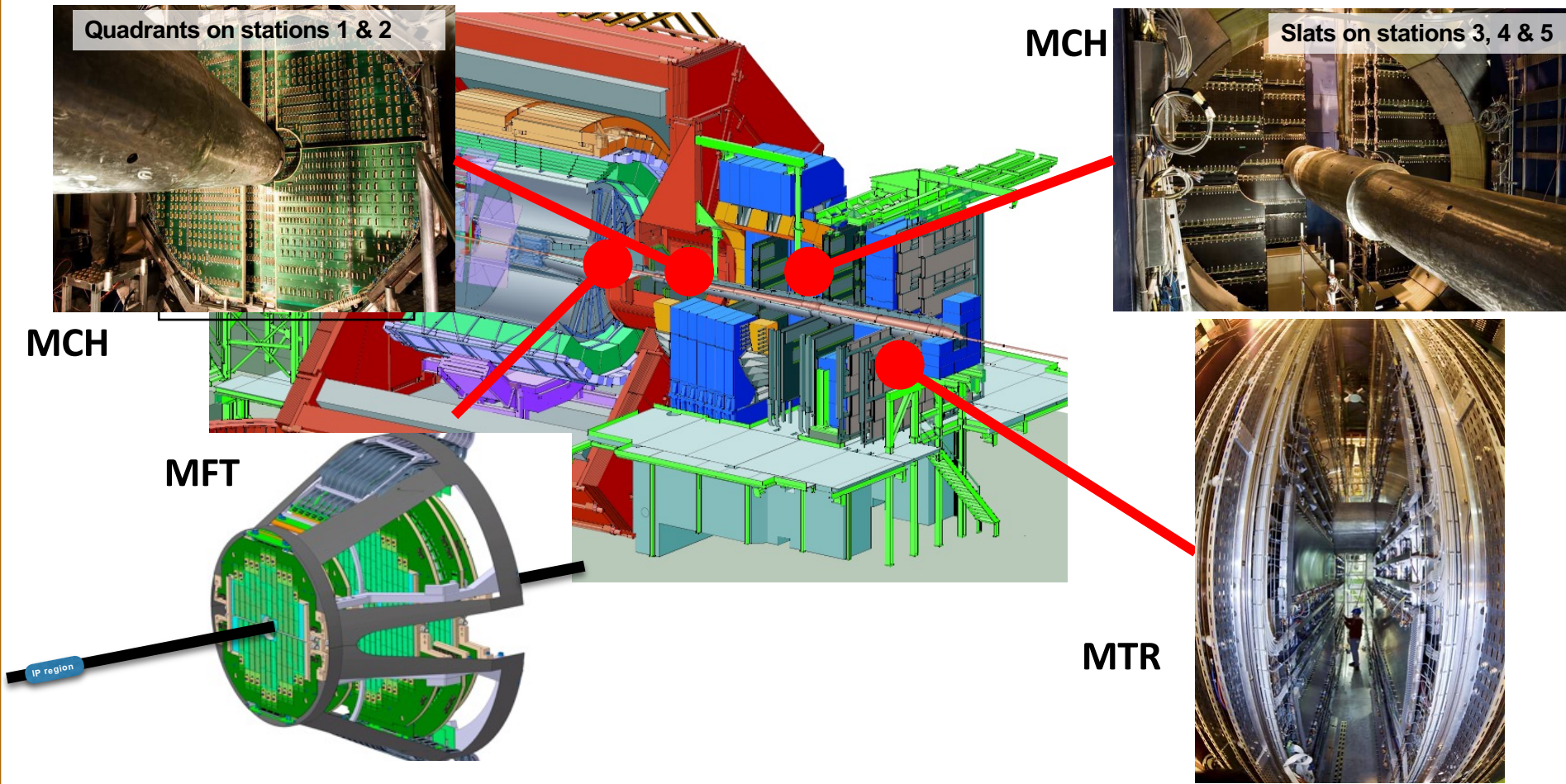
1

MCH status

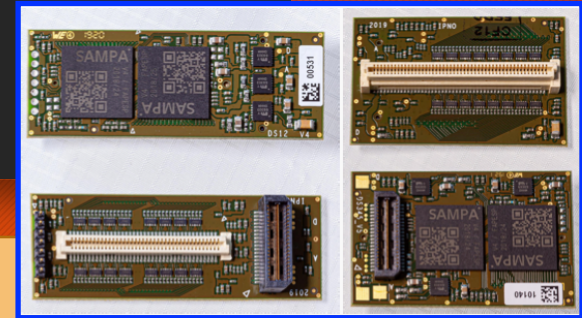
21 luglio 2022

Corrado Cicalò - Cagliari

Il muon tracking



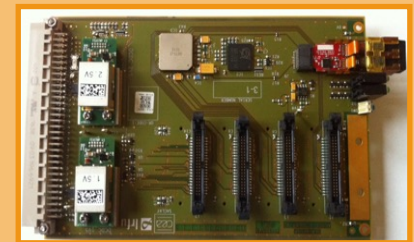
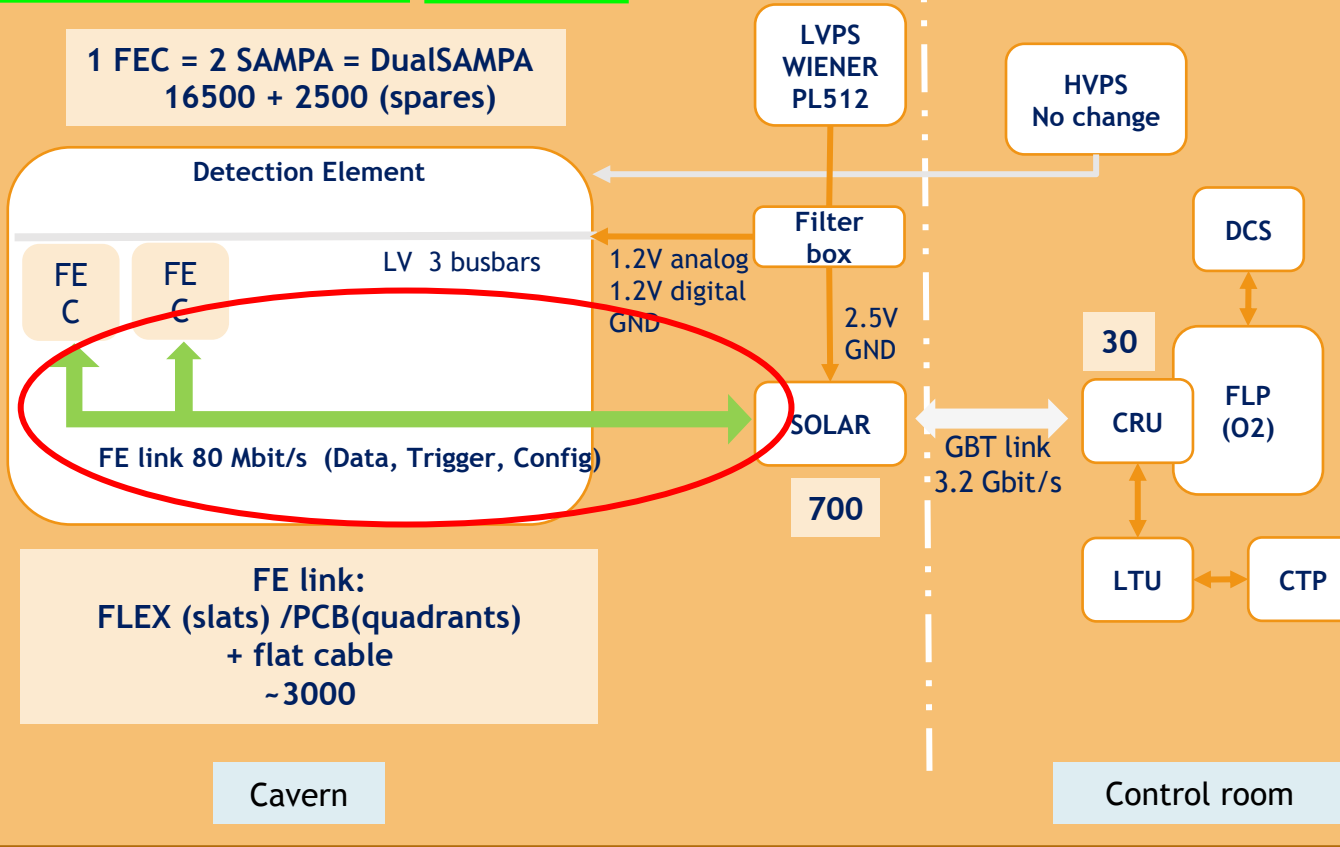
MCH upgrade project



DualSampa FEC

SAMPA: Brazil
CRU: Hungary, India

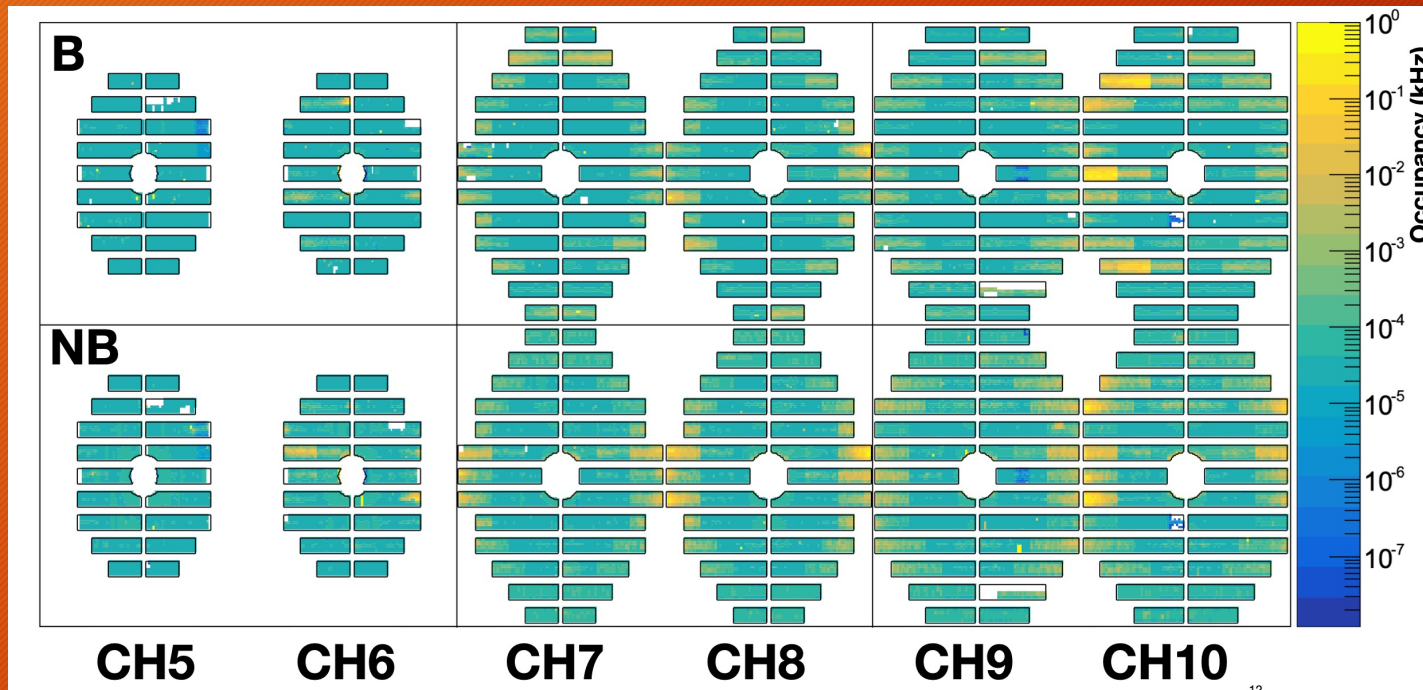
FEC: Orsay
FLEX: Cagliari
SOLAR : Saclay
CRU: India
(Kolkata, Aligarh)



SOLAR board

Situazione Upgrade

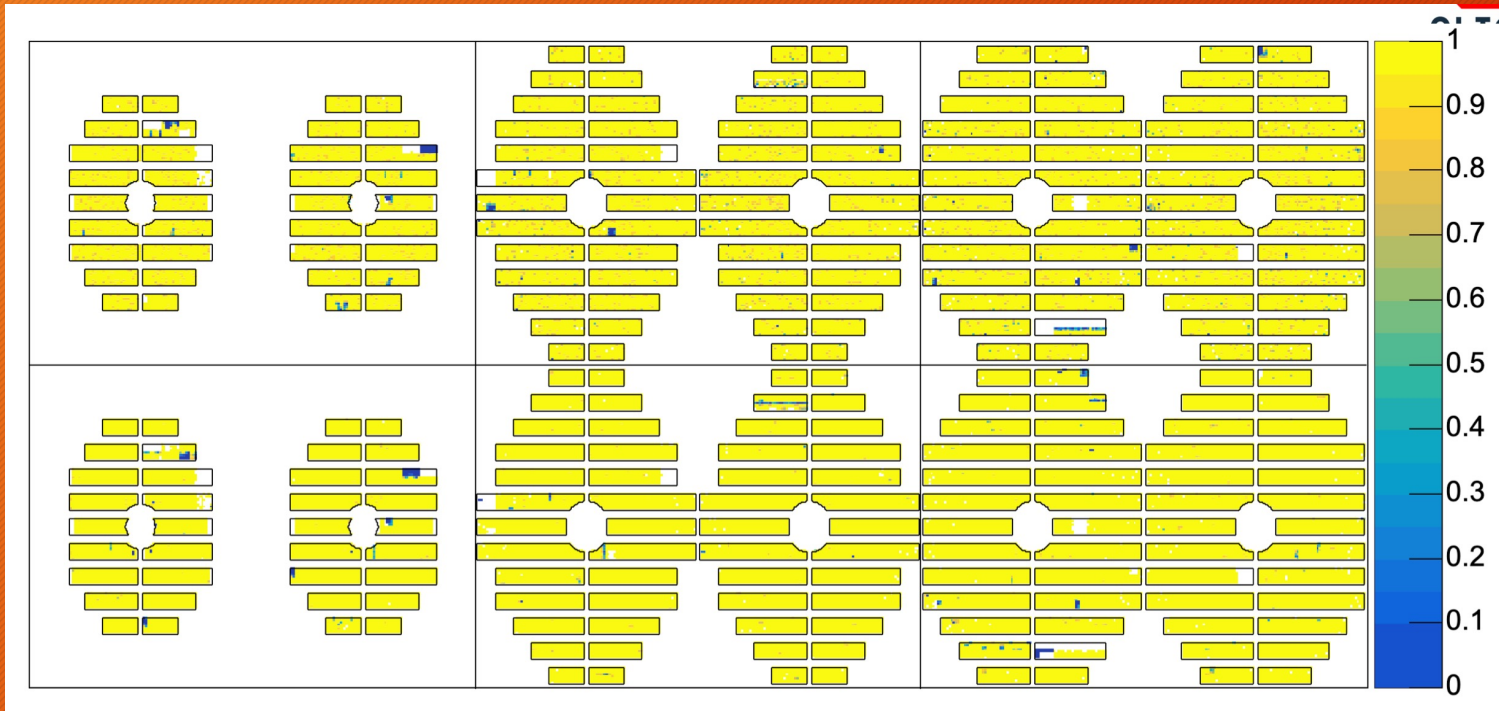
- Installazione e commissioning nuova elettronica completati all'inizio del 2022
- In corso RUN @ HIGH RATES



Occupazione Regolare

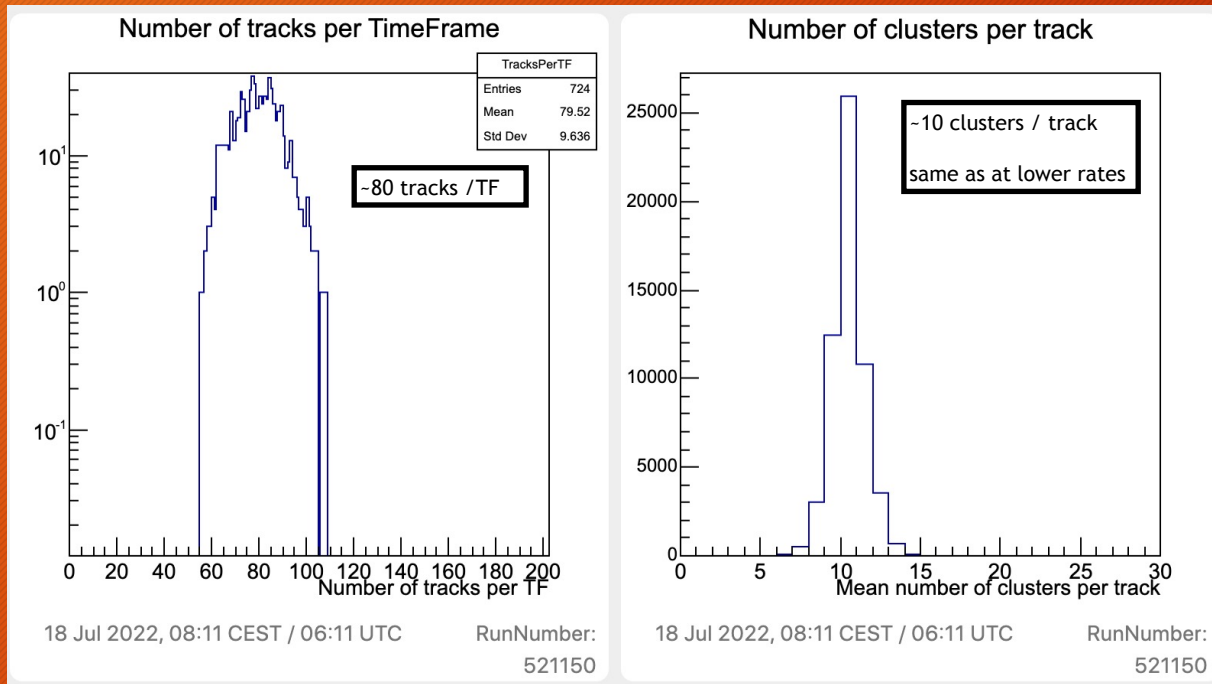
RUN N. 519499 del 27/6/2022

ST345 Pseudo-efficiency 2D Maps (run 519499 - 27/6/22)

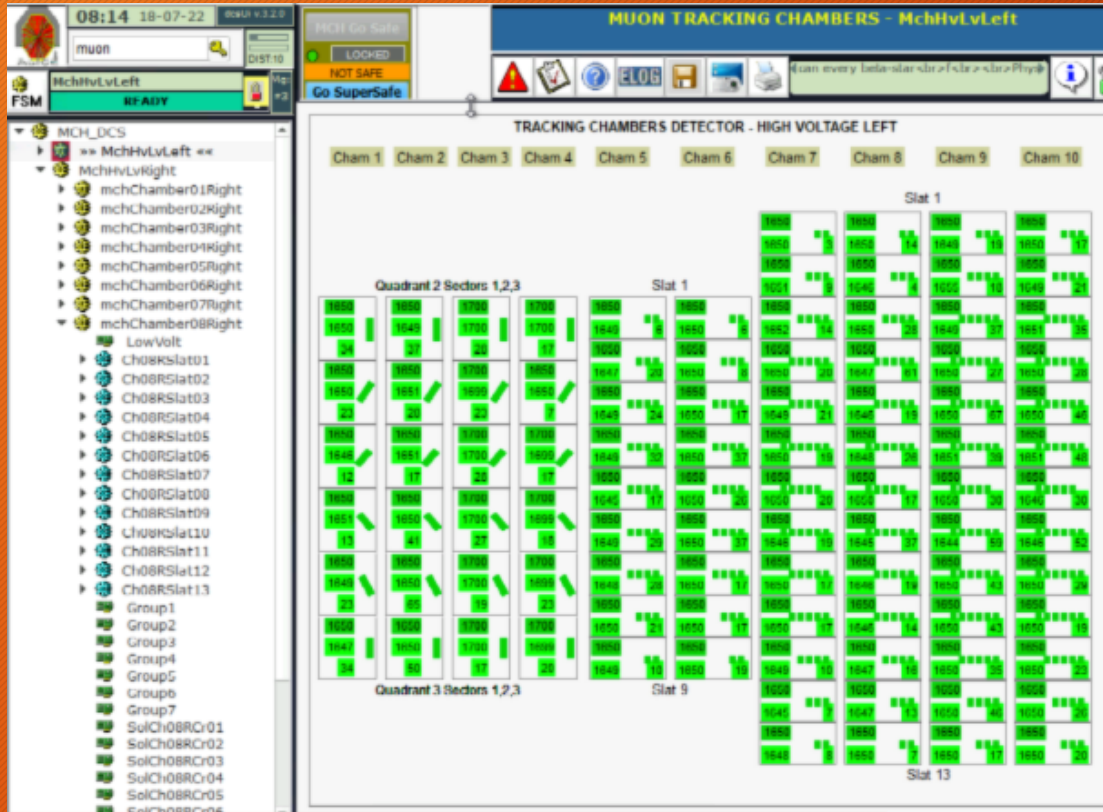


MCH @ High Rates

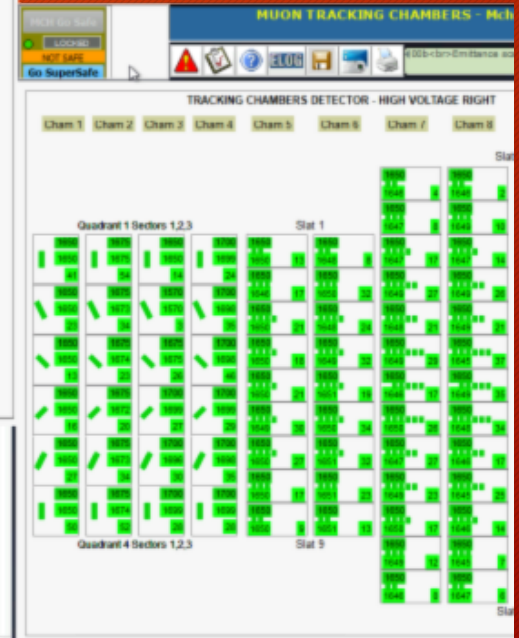
- **Run 521150:** Inst. luminosity $\sim 3.4 \text{ Hz}/\mu\text{b}$ \leftrightarrow FT0VTX rates $\sim 200 \text{ kHz}$
- increase in avg. number of tracks as expected wrt lower rates
- High-voltage currents on detectors **OK**



MCH @ High Rates

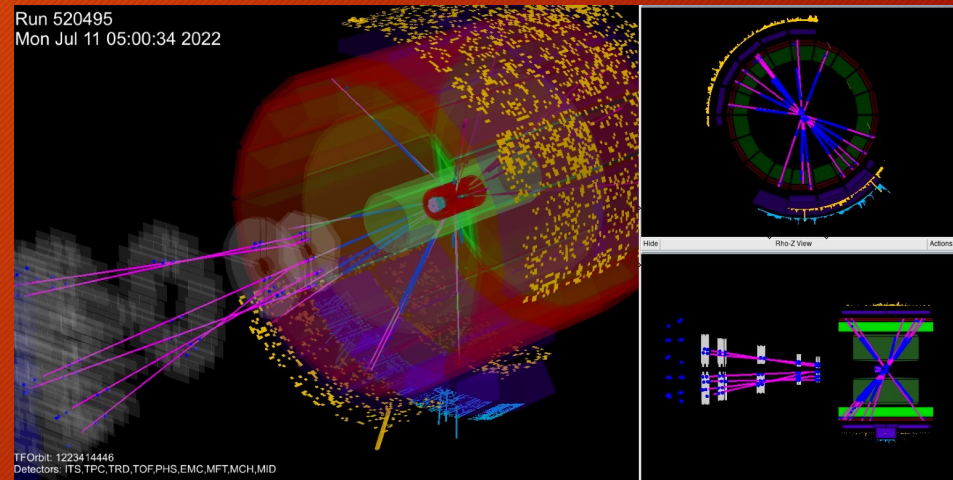


All current values below 60 nA
on all detection elements : OK



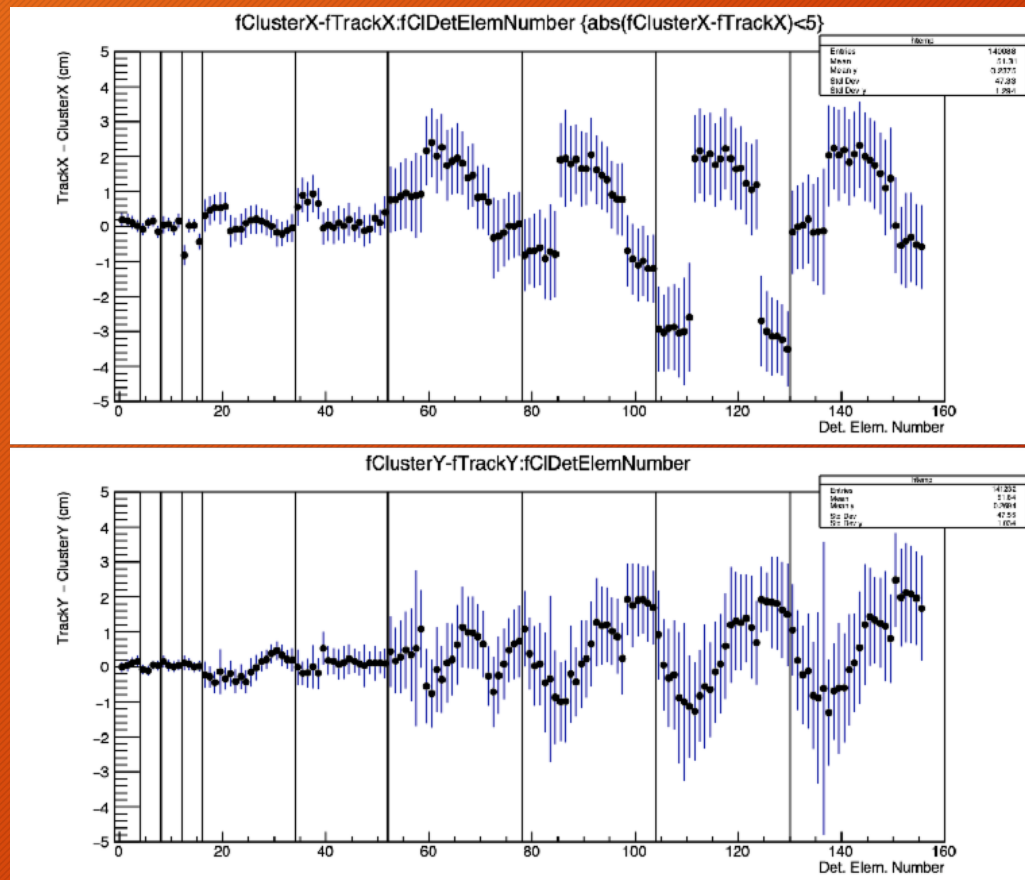
Muon Spectrometer Alignment

- About **6h of B=0 data** for muon spectrometer alignment:
 - **RUN: 520496, 520497, 520498, 520499, 520500 520506, 520507, 520508, 520509**
 - **10 kHz trigger rate**
 - **>10M MCH tracks from first estimates**
- Analysis started on a small data sample to test the "machinery"
- Asynchronous processing of B=0 data **needed ASAP**, as full alignment procedure will require at least a couple of months...



First Look at MCH Alignment

Track-cluster residuals from ~10k MCH+MID tracks



Non Bending

Bending

MCH DCS - Automated FEE Configuration

- Fully automated SOR(Start of Run) procedure → **VALIDATED**
 - ✓ "PEDESTALS" mode for calibration
 - ✓ "PHYSICS" mode for normal data taking
 - two additional SOR parameters to set TRIGGERED/CONTINUOUS mode and enable the SAMPA cluster sum
 - ✓ At SOR the scripts check the last known configuration type and avoid re-configuration if already OK
 - ✓ Re-configuration can still be forced if needed...
- Visualization panels showing status of SAMPA boards after configuration
 - Part of Joyful Mdhuli's (South Africa PhD student) service work
- Log screen showing the processing flow during the configuration of FEE

MCH DCS - FEE Configuration Summary Panel

Visualization of FEE

Panel with SAMPa configuration details

CH1

LEFT 8/894

RIGHT 5/897

Number of configured and failing boards

Solar crate	Solar ID	Slat ID
SolarC24	S192	DE101
SolarC24	S193	DE101
SolarC24	S194	DE101
SolarC24	S195	DE101
SolarC24	S196	DE101
SolarC24	S197	DE101
SolarC16	S128	DE101
SolarC16	S129	DE101
SolarC16	S130	DE101
SolarC16	S131	DE101
SolarC16	S132	DE101
SolarC16	S133	DE101
SolarC21	S168	DE102
SolarC21	S169	DE102
SolarC21	S170	DE102
SolarC21	S171	DE102
SolarC21	S172	DE102
SolarC21	S173	DE102
SolarC36	S288	DE102
SolarC36	S289	DE102
SolarC36	S290	DE102
SolarC36	S291	DE102
SolarC36	S292	DE102
SolarC36	S293	DE102

Back

● configured
● failed

New MCH DCS UI - Manual FEE Configuration

The screenshot displays the 'MCH DCS FEE PANEL' interface. The top status bar shows 'NOT EXISTS' and 'PROTON PHYSICS RAMP DOWN'. The left sidebar has 'Mch UI' and 'MchFEE' tabs. The main panel is divided into two sections:

FEE LV CONTROL

Buttons: Power-Cycle SOLAR, Switch OFF SOLAR, Switch ON SOLAR.

ST1 ON	ST2 ON	ST3 ON	ST4 ON	ST5 ON
CH1 ON	CH3 ON	CH5 ON	CH7 ON	CH9 ON
CH1L ON	CH3L ON	CH5L ON	CH7L ON	CH9L ON
details	details	details	details	details
en boards	en boards	en boards	en boards	en boards
CH1R ON	CH3R ON	CH5R ON	CH7R ON	CH9R ON
details	details	details	details	details
en boards	en boards	en boards	en boards	en boards
CH2 ON	CH4 ON	CH6 ON	CH8 ON	CH10 ON
CH2L ON	CH4L ON	CH6L ON	CH8L ON	CH10L ON
details	details	details	details	details
en boards	en boards	en boards	en boards	en boards
CH2R ON	CH4R ON	CH6R ON	CH8R ON	CH10R ON
details	details	details	details	details
en boards	en boards	en boards	en boards	en boards

FEE CONFIGURATION

CONFIG TYPE:
1 - Pedestal-UL calibration
2 - Physics-UL continuous
3 - Physics-UL continuous_csum
4 - Physics-UL triggered
5 - Physics-UL triggered_csum

MCH: [dropdown]
STATION: [dropdown]
CHAMBER: [dropdown]
CH SIDE: [dropdown]
DE: [dropdown]
CONFIG TYPE: [dropdown]
RUN: Full Config [dropdown]
☐ WithoutHardReset
INIT FEE [button] CONFIGURE FEE [button]
FULL CONFIGURE [button]

MONITOR SOLAR

Monitor SOLAR Parameters [button]
CLOSE [button]

Panel allowing to manually configure individual stations/chambers/detectors or the whole MCH

MCH DCS - Automated Clock Transition Handling

- **Fully automated recovery** of GBTx links from **clock transitions** → **VALIDATED**
 - during transition countdown: **switch OFF** the GBTx LVs
 - at end of transition: **switch back ON** the GBTx LVs
- Power-cycling of GBTx links that **do not come up properly**
 - use IC reads/writes to “probe” the link status
 - all links always UP after few iterations
- **FEE re-configured** according to the last known run type
- Procedure integrated within SOR scripts

Quality Control Status


- **Basic analysis of raw data decoding:**
 - detector occupancy (2D maps + detection element averages)
 - digit time distributions
 - monitoring of decoding errors frequency
- **Higher-level analysis of event reconstruction:**
 - **time clustering:** ROFs occupancies and time distributions
 - **pre-clustering:** signal charge integral, cluster size distribution, cluster occupancies, pseudo-efficiencies (from geometrical correlation between B and NB planes)
 - **tracking:** fit quality, angular distributions, invariant mass
 - ✓ now available for both standalone MCH tracks and matched MCH+MID tracks

Outlook

- System in good shape for Pb-Pb RUN
- Few issues due to LVPs failure
- Some maintenance intervention foreseen during shutdown

ALICE training run coordinator (TCO)

• ROLE AND OPEN CALL (12/2021)

 **ALICE Spokesperson** <alice.spokesperson@cern.ch>
to alice-member ▾

Thu, Dec 2, 2021, 7:37 AM ☆ ↶ ⋮

Dear Colleagues,

We need your help in identifying suitable candidates for the shift Training Coordinator (TCO). Together with the Run Coordination (RC), we came to the conclusion that organizing adequate shifter training for RUN 3 needs special attention. With the new operating procedures for our new and upgraded systems, the operations in the control room and responsibilities of the shift crew had to be significantly reworked. We are convinced that quality and consistent training will ensure competent and reliable shift crews that in turn can assure efficient operations and data collection.

We are looking for candidates who would work with RC taking up a role of TCO for one year. This function would take up about 0.5 FTE. Continuous presence at CERN is preferred and in some critical periods, it would be required (details to be agreed with the Run Coordination).

Please let us know if you know a suitable candidate. Of course, we encourage self-nominations.

Please make sure that your input reaches us no later than the 17th of December, 2021.

Please find more information regarding the task below.

Kind regards,
Your Spokesperson's Team and Run Coordination

Requirements

- Experience and insight with the operation of all the ALICE detectors and online systems
- Knowledge of the LHC accelerator and P2 technical infrastructure and support systems
- Good communications and pedagogical skills and ability to transfer knowledge effectively
- RUN1/RUN2/RUN3 commissioning experience is welcomed

Responsibilities

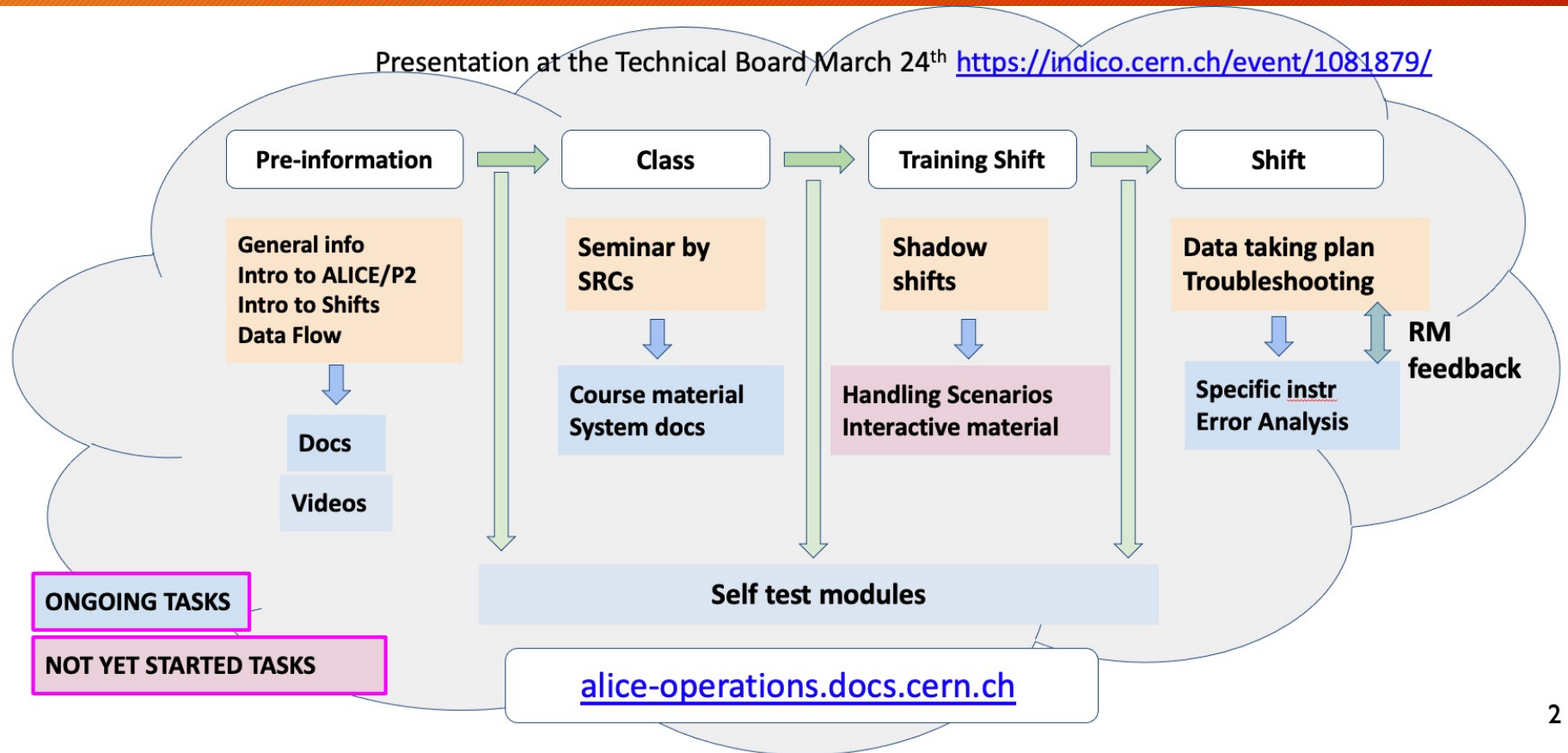
1. Prepare and give to trainees general introductory lectures for QC, DCS and ECS roles, reviewing the introduction to LHC, ALICE, P2 infrastructure, and support systems presenting an overview of all components and their interconnections.
2. Review and harmonize training material produced by the QC, DCS, ECS SRCs and evaluate/discuss the testing procedures to form good shifters.
3. Steered by RC, manage a regular calendar of SL classes, and produce the needed material for the SL training and testing, keeping it up to date.
4. Periodically evaluate the effectiveness of all the training procedures with respect to operation and its evolution in time (classes, training shifts, testing). Propose/discuss with RC corrections and improvements ensuring that shifters are well trained and acquired the required skills.
5. The TCO will give a refresher lecture or class to the incoming Run Manager candidates that will include advanced material based on the SL documentation.
6. Manage the training shifts in SAMS.

Together with the Run Coordination (RC), we came to the conclusion that organizing adequate shifter training for RUN 3 needs special attention

- 0.5 FTE
 - 6 months devoted to TCO
- Presence at CERN preferred in 2022

CLASSES AND DOCUMENTATION PRODUCTION

Presentation at the Technical Board March 24th <https://indico.cern.ch/event/1081879/>



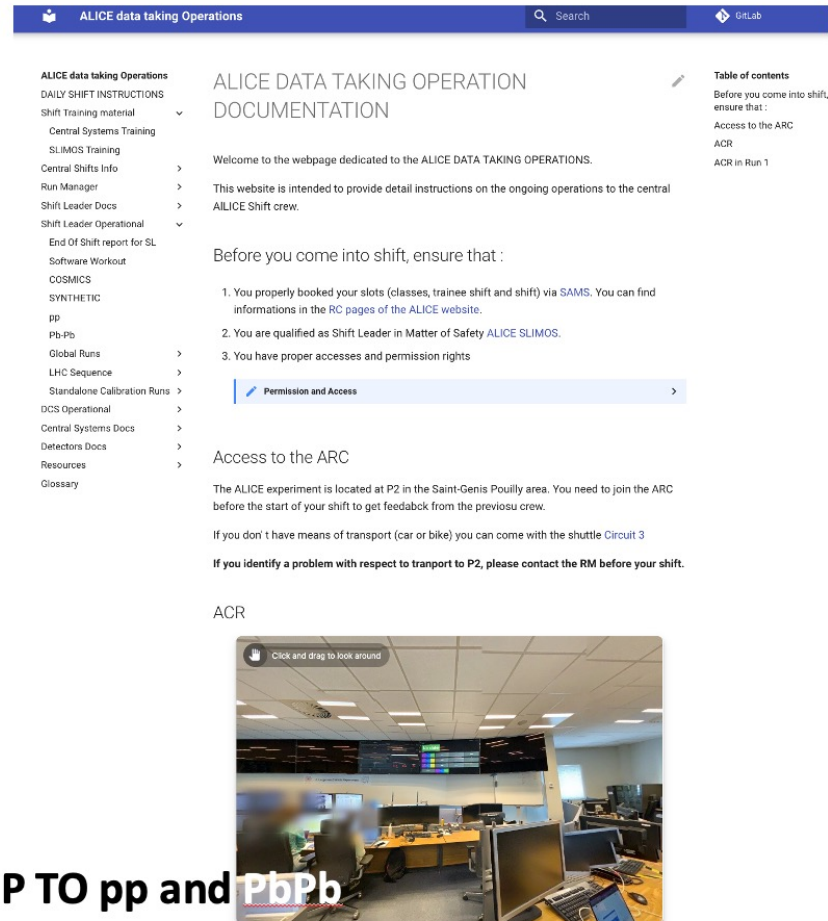
Information for RUN Coordinator

A Large Ion Collider Experiment

RC INFORMATION HUB

- alice-operations.docs.cern.ch
 - Single point information source
- Classes
- Training
- Shifts Manuals
- Shift Instructions
- Run Manager Duties and Instructions
- Central Systems Documents
- Detector Documents
- Resources
 - Link to online systems
 - Link to monitoring systems
- Glossary

NEED CONTINUOUS INTEGRATION UP TO pp and PbPb



ALICE data taking Operations

ALICE DATA TAKING OPERATION DOCUMENTATION

Welcome to the webpage dedicated to the ALICE DATA TAKING OPERATIONS.

This website is intended to provide detail instructions on the ongoing operations to the central ALICE Shift crew.

Before you come into shift, ensure that :

1. You properly booked your slots (classes, trainee shift and shift) via SAMS. You can find informations in the RC pages of the ALICE website.
2. You are qualified as Shift Leader in Matter of Safety ALICE SLIMOS.
3. You have proper accesses and permission rights

Permission and Access

Access to the ARC

The ALICE experiment is located at P2 in the Saint-Genis Pouilly area. You need to join the ARC before the start of your shift to get feedback from the previous crew.

If you don't have means of transport (car or bike) you can come with the shuttle Circuit 3

If you identify a problem with respect to transport to P2, please contact the RM before your shift.

ACR

Click and drag to look around

2022 COMMITMENT

0.5 FTE

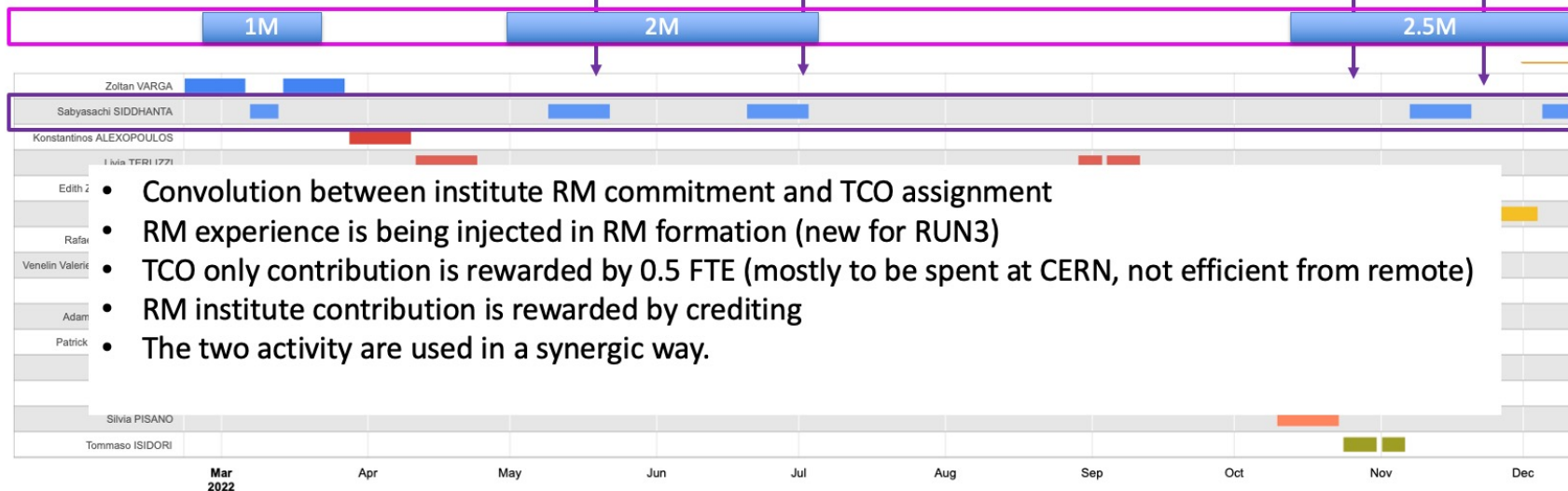
- TCO: 6M OF Presence at CERN
- + 75 credits from RM shifts

SB 900 GEV

SB 13.6 TEV

PB-PB PREP

PB-PB



- Convolution between institute RM commitment and TCO assignment
- RM experience is being injected in RM formation (new for RUN3)
- TCO only contribution is rewarded by 0.5 FTE (mostly to be spent at CERN, not efficient from remote)
- RM institute contribution is rewarded by crediting
- The two activity are used in a synergic way.

Richiesta straordinaria 2022

- Sul capitol missioni: 7 kEuro per permettere le attività al CERN del TCO e le manutenzioni pre-run del MCH (avevamo sottratto 10keuro s.j. da questa voce a giugno su indicazione dei referee)

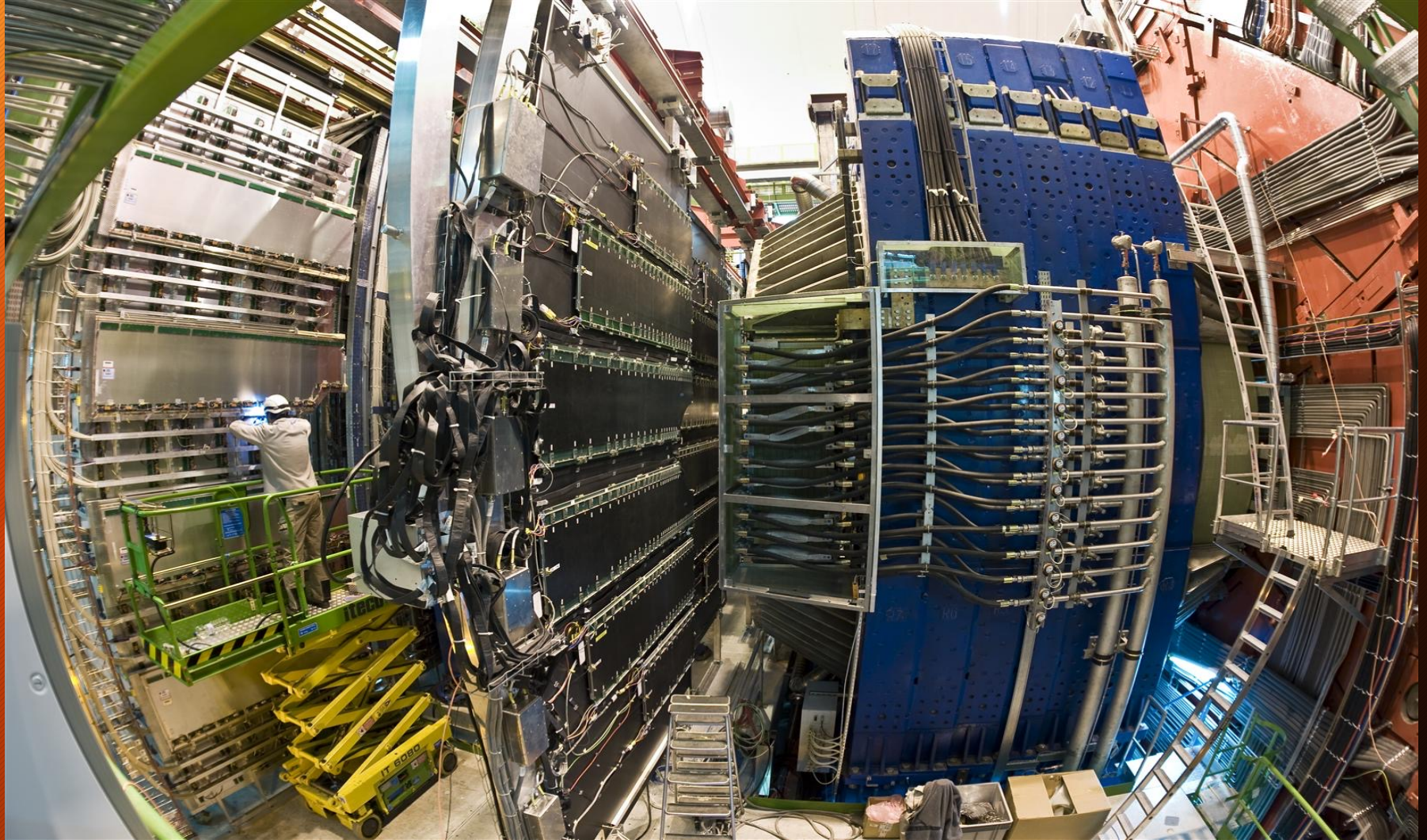
Richieste per il 2023

Composizione del gruppo ALICE Cagliari: 11.5 FTE

- **Sigle Sinergiche: CA_2020 terminata. FTE riconfluiti su ALICE**
- **Richieste specifiche Missioni:**
 - Per interventi sull'apparato: 10 kEuro
 - Training RUN coordinator: 15 kEuro
- **Richieste specifiche consumo:**
 - 4.5 keuro auto CERN x turni e oncall
 - 1.5 keuro consumo per interventi su MCH (e ZDC)

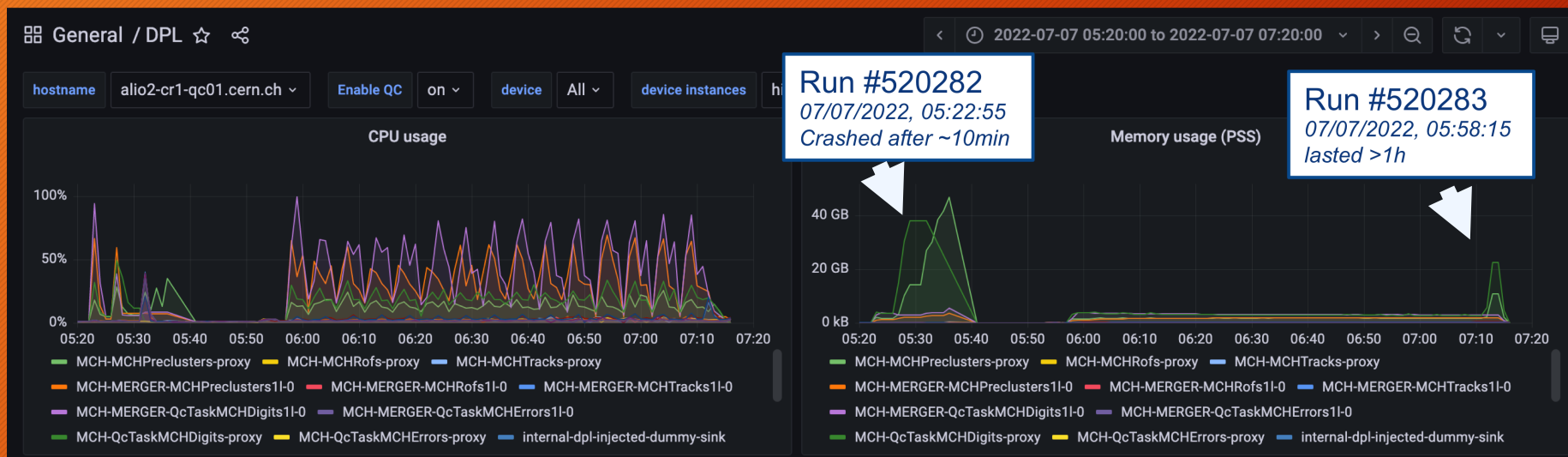
Training Run Coordinator

END



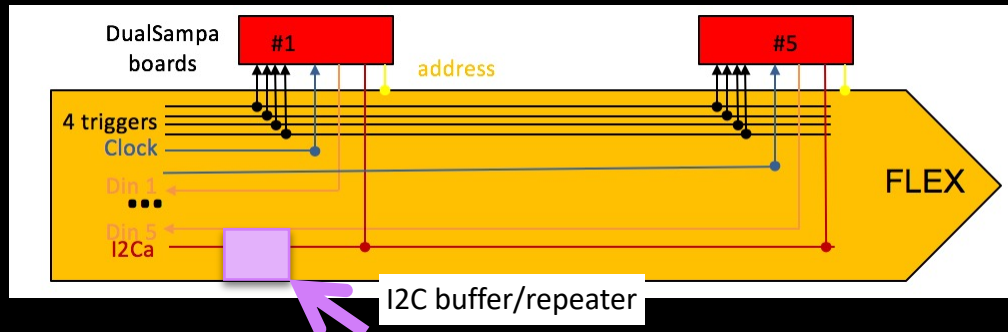
QC Processing and Merging Issues

- **Several runs stopped due to MCH QC errors/crashes on merger node:**
 - Probably due to large number of plots being merged
 - No clear pattern: some runs crashed very quickly, other lasted for > 1h



- **Current mitigation measure:** longer cycle duration for pre-clusters task, to reduce load on merger
- Also missing plots in calibration runs from time to time since last software update
Reason not yet clear, might be due to the way processes are stopped/killed on the EPNs...

MCH Upgraded Readout - Interface PCBs

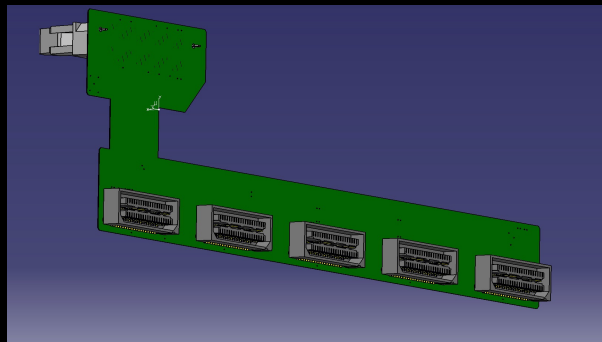


- DATA : 1 differential line per DS
- Clock: 1 differential line per DS
- 4 triggers (ϕ , Heartbeat, Sync, Hard Reset) will be chained on 5 DS
- 1 I2C line will address 5 DS
 - I2C buffer/repeater added to improve stability

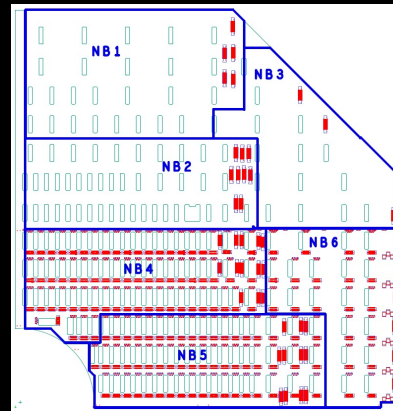
FLEX: INFN Cagliari

PCB Station 1: IPN Orsay

PCB Station 2: India Kolkata+ Aligarh

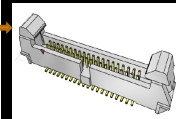
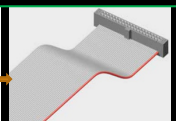
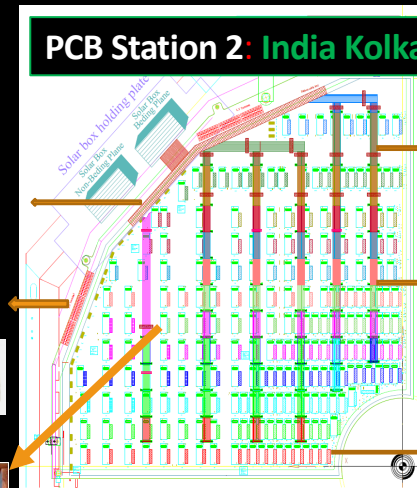


New design, more compact
Rigid pads → Hybrid circuit



Cable-tray

Bus-conector for LV & G

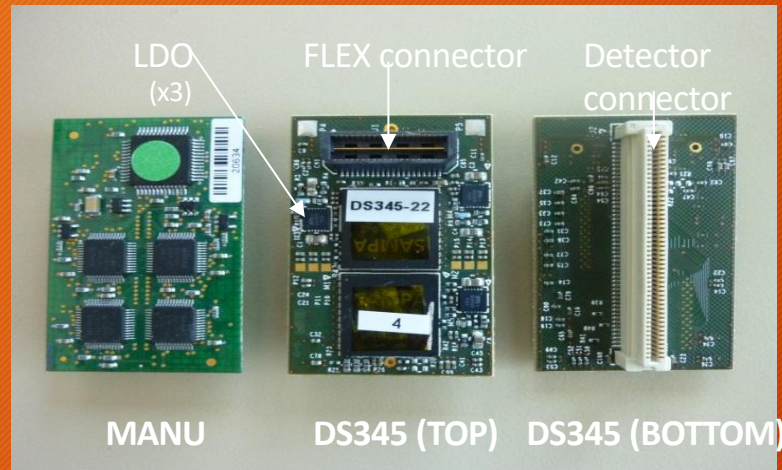


D-SM



MCH Upgraded Readout - DualSAMPA Front-end Boards

IPN Orsay



2 SAMPA chained on one DualSAMPA board

2 types of DualSAMPA:

DS12 for quadrants,

DS345 for slats

