EP/DT-DI
Detector Interface Section

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CERN

EP-DT
Detector Technologies

Mandate

- The Detector Interface section combines the EP-DT years-long expertise in control and safety systems for experiments' infrastructure, with the introduction of the support for data acquisition and monitoring systems targeting small- and mid-scale experiments and projects. The long-term aim is to create a combined environment for controls and DAQ to be offered to the experiments requesting it.

LHC MCP=Magnet Control Project

- Control, Safety and Monitoring of the LHC experimental magnets
  - Team provides 24/7 standby duty (**piquet**!) for magnets and DSS.
  - Maintenance and support for LHC experiments
  - Spiky activity: too much or too little…

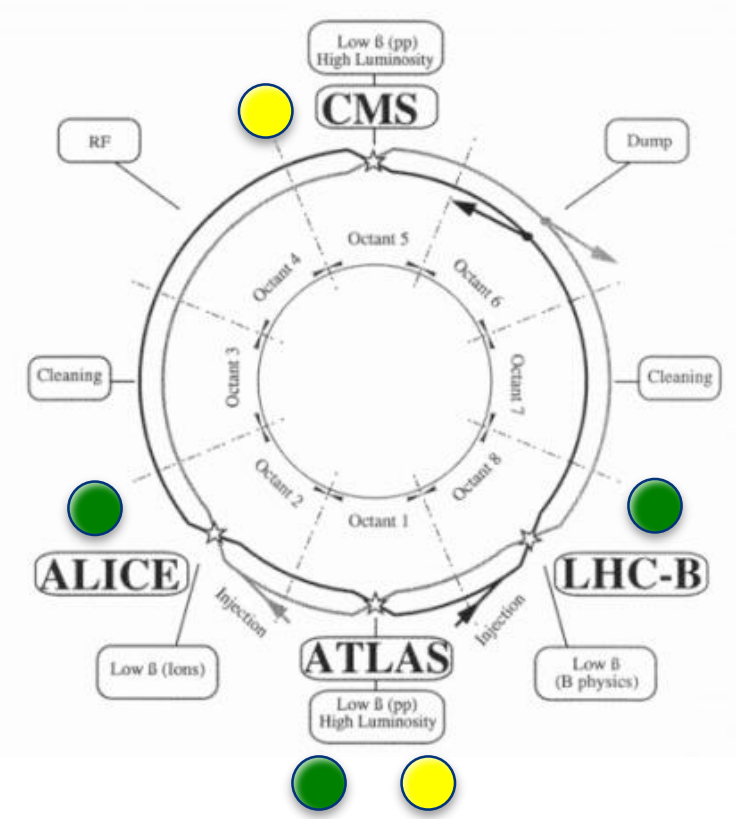
On October 20th 2016 the DT operations group received the

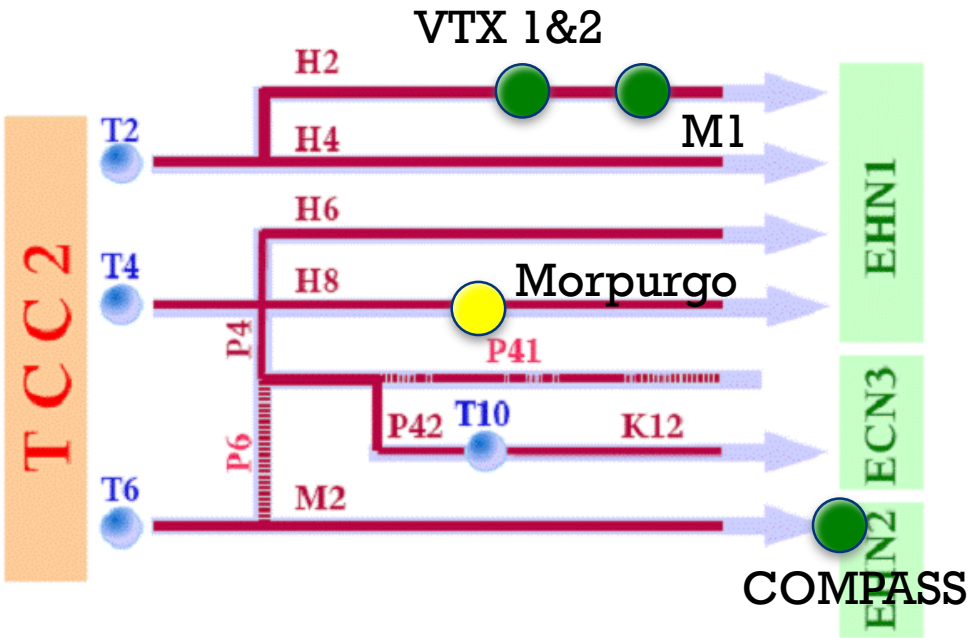
ATLAS Outstanding Achievement Award

"for the outstanding work of repairing the bellows for the endcap C toroid"

Magnet Safety Systems

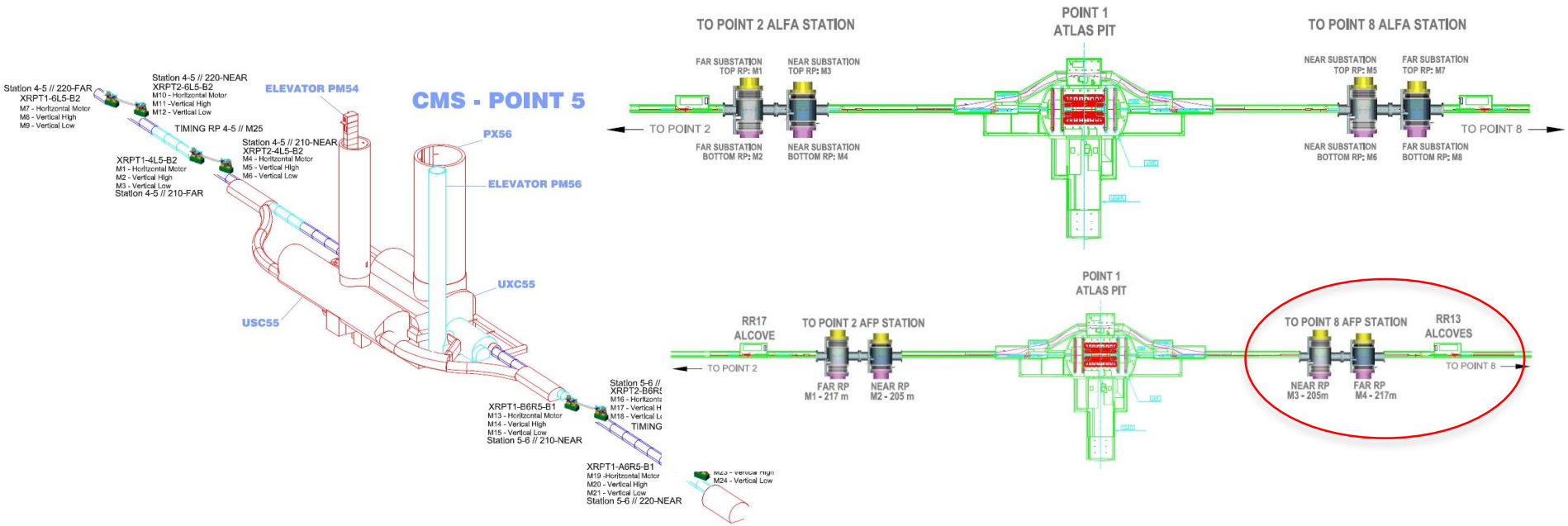
- In 2016 continued modernization process for the Magnet Safety Systems (from MSS -> MSS2)





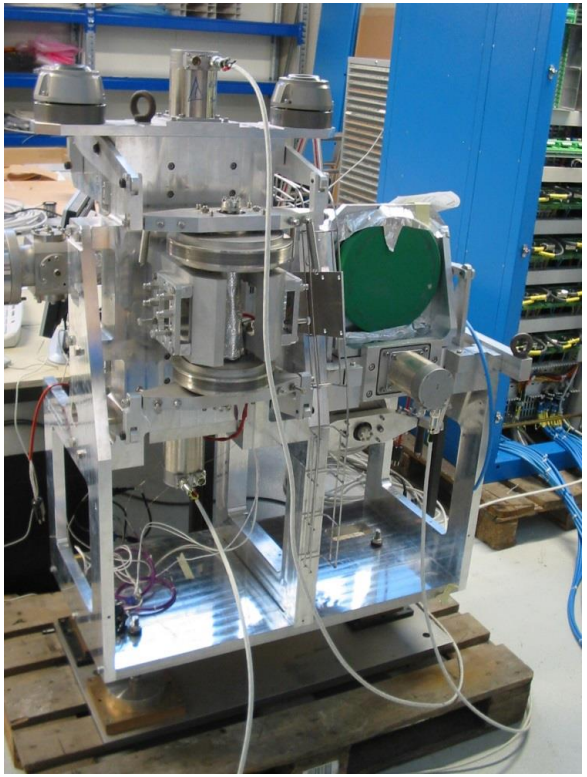
Control for Roman Pots

- Control of movement and vacuum: ALFA, TOTEM, AFP
- A lot of experience
  -> upgrade of LHCb VELO movement control system in LS2

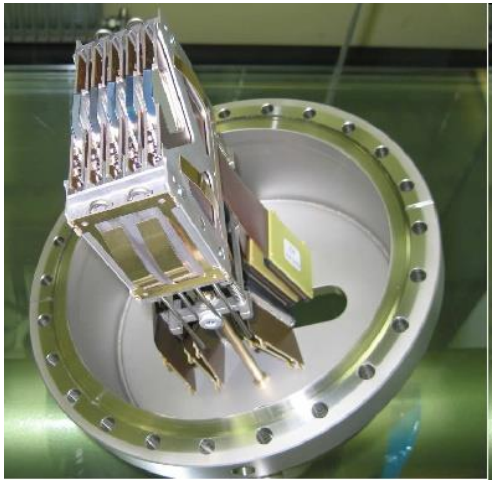


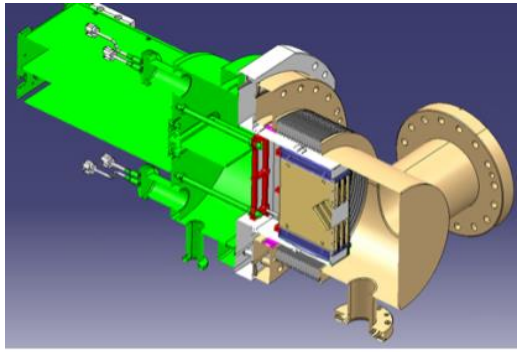
TOTEM

RPs are movable beam pipe insertions, which can be positioned very close to the beam

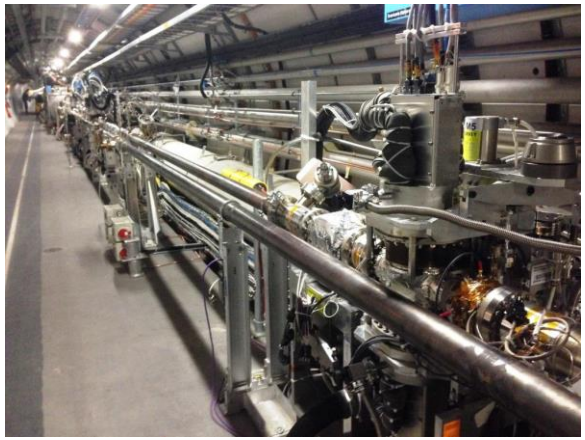


a RP station consists of:
- a VERTICAL TOP RP
- a VERTICAL BOTTOM RP
- a HORIZONTAL RP



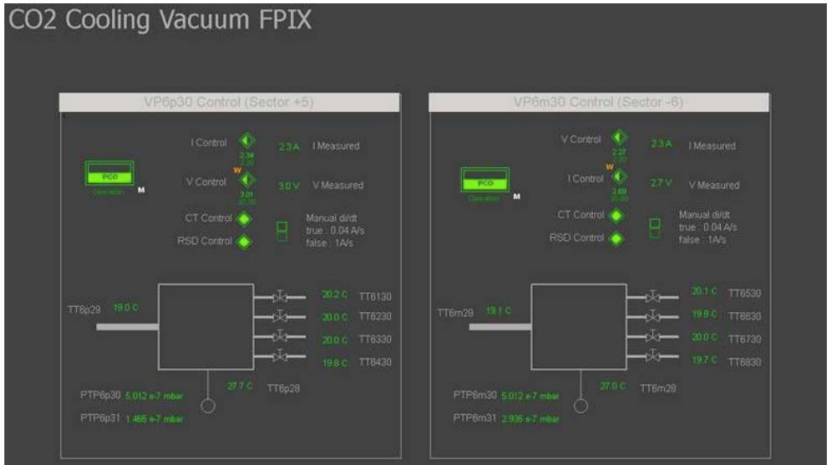


TOTEM silicon (or tracking) detector



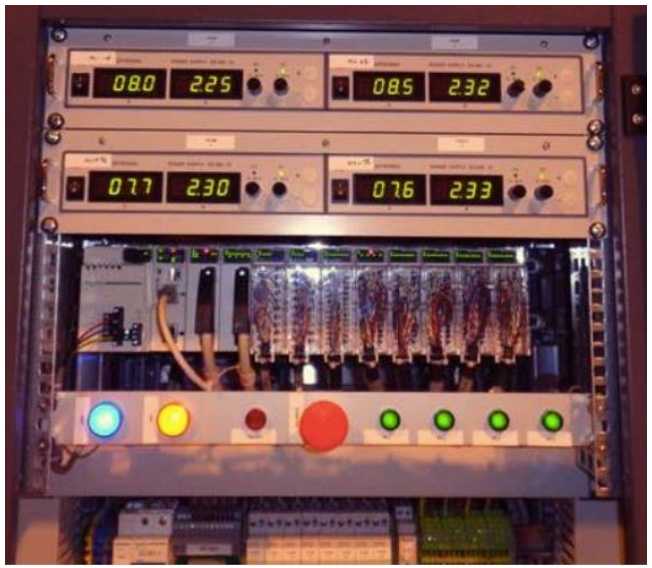
RP station installed in the LHC beam pipe

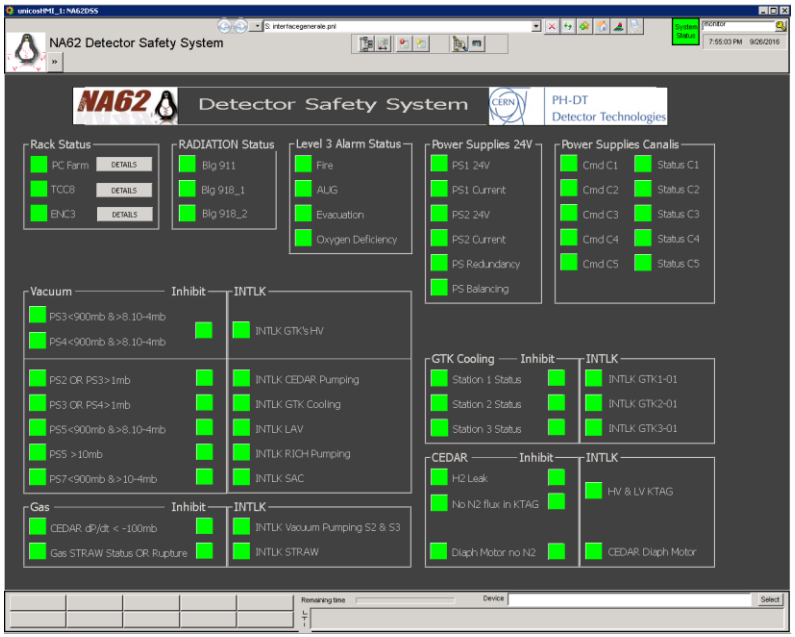
Other Control Systems Examples



Vacuum control for CMS CO_2 cooling in collaboration with DT-FS

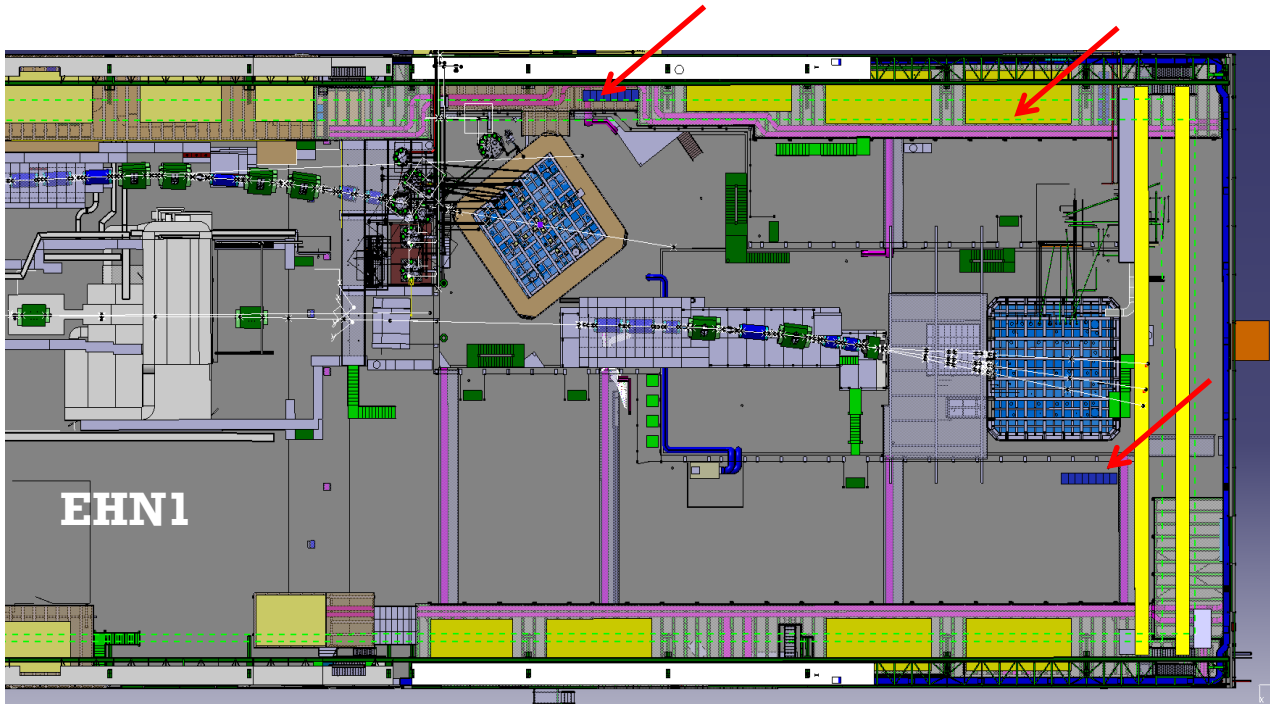
NA62 Detector Safety System





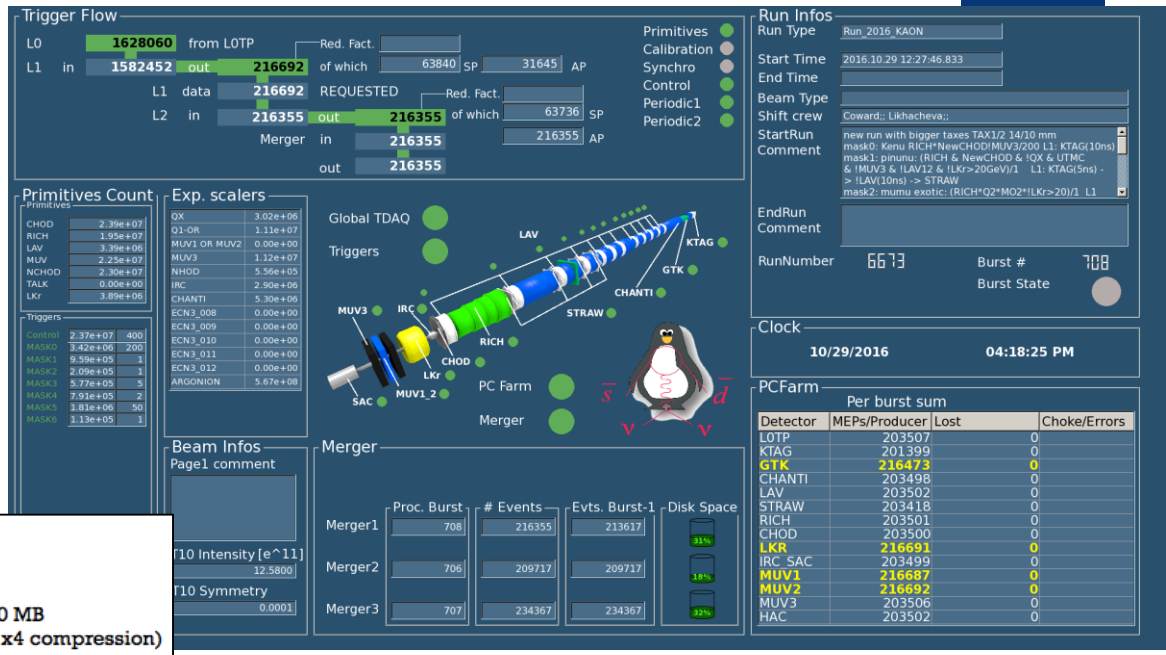
ProtoDUNE

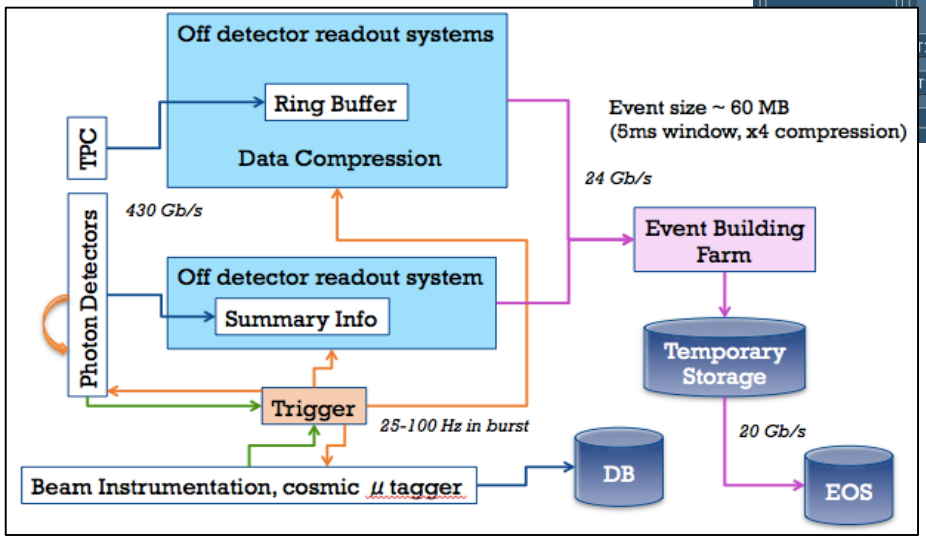
- Large (~1 kt) LAr TPC prototypes for future neutrino experiments.
  - Data taking at SPS in 2018!
- Control system for "small" WA105 prototype (2015 – 2017)
- Co-responsibility for
  - Control systems for ProtoDUNE SP/DP
  - DAQ for ProtoDUNE SP



Data Acquisition Activities

- Contributed to stabilization and performance optimization of NA62 DAQ software
  - Structural upgrades during YETS
  - Participating to data taking efficiency assessment





- Co-leadership of DAQ for protoDUNE SP
  - Introducing LHC state of the art (JCOP, FELIX, …)
  - Design review 3-4 Nov.
- Informally contacted by 2 more experiments
  - Faster progress by joining forces…

Summary

- 2016 has been a super-busy year, operations wise
  - Satisfaction of operations effort being rewarded/recognized.
  - Several incidents affecting magnets for LHC experiments: none was caused by our control systems, but we are the ones giving the bad news, providing root cause information and intervening to bring the magnets back to operational.
- Expertise of the group solicited well beyond LHC experimental magnets
  - E.g. LHCb VELO movement control, control systems of ProtoDUNE.
- DAQ activity started first as "consultancy", now gained a lot of momentum
- Important plans laid out with group and department management to reinforce the team on all fronts.
  - 1 student (NA62), 2 fellows (DAQ), 1 TTE & 1 LD (controls + piquet)
- This year we have laid the ground to address our mandate
  - Very active on controls and DAQ
  - Still to come is the development of a COMBINED DAQ/Control system for experiments (timescale 2-3 years)