

# DCS of TileCal and Forward Detectors

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Experimental de Partículas

Jornadas LIP, Braga 19 – 02 – 2016



# Detector Control System

- Responsible for the coherent and safe operation of the detector
- Monitor and archives the operational parameters
- Interface between operator and detector

## LIP responsibility

- TileCal – coordination, development, maintenance and continuous upgrade
  - F. Martins (coordinator), J. Campos and L. Seabra
- ALFA – coordination, development, maintenance and continuous upgrade (L. Seabra)
- AFP – collaboration (L. Seabra)

## Long Shutdown 1 Upgrade **NEW**

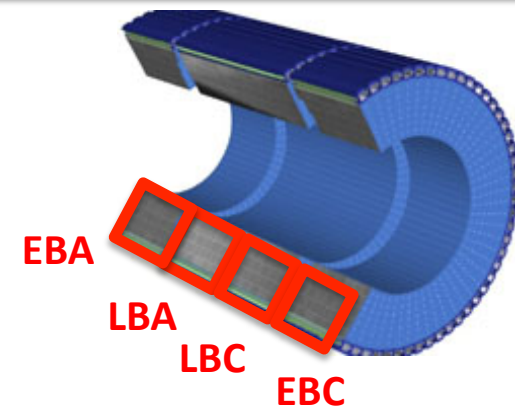
- Remove limitations and improve performance from Run 1
- Upgrade of all sub-detectors (hardware and software)
- ATLAS DCS followed ATLAS wide controls in HW and SW updates
  - Server with Linux SLC6 + VM with Windows 2008 + interfaces
  - WinCC UA version
  - Migrate the old DCS projects into the new systems

TileCal DCS

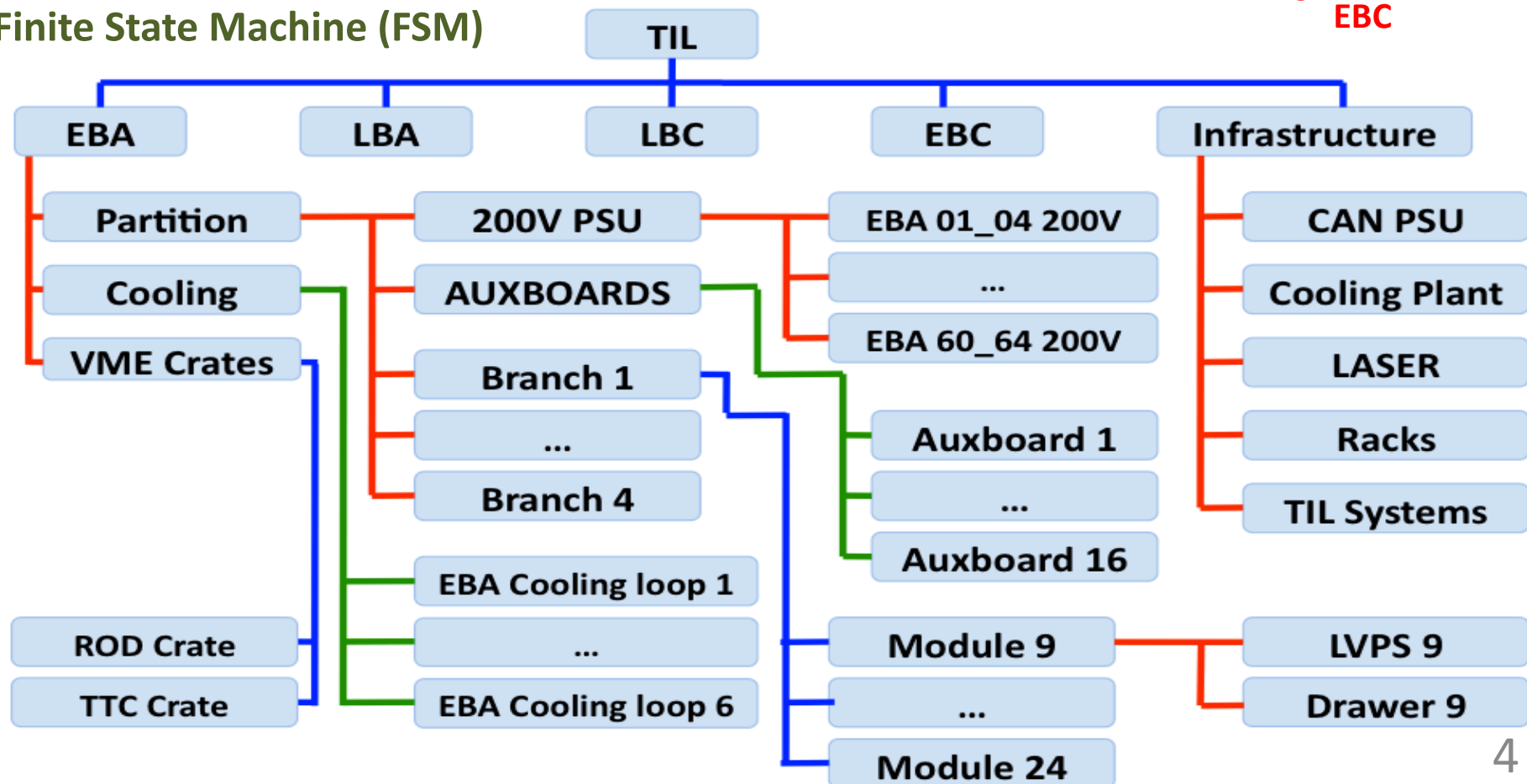
# TileCal

## Detector system

- Sampling Calorimeter (steel plates and scintillating tiles)
- Readout by wavelength shifting optical fibers into PMTs
- One long barrel and two extended barrels (into 4 partitions)
- Each partition is divided into 64 independent modules



## Finite State Machine (FSM)





- Phase II -> High Luminosity in LHC
- Replacement of the front-end electronics (new read-out architecture)
  - Reduce single point failures – redundancy of low voltage power
- DCS data for HV distribution system will flow in parallel with physics data to sROD

## **Main developments for DCS (Ready for test beam last year)**

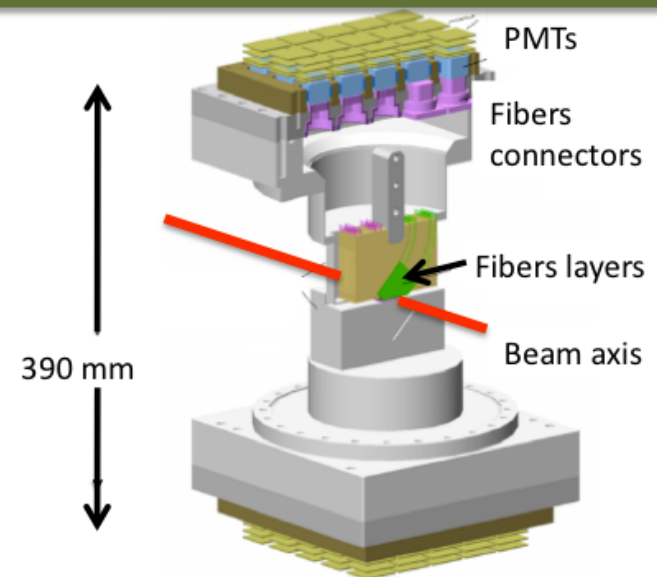
- HV Distribution system – two options under evaluation that require design/development (OPC)
  - HV Remote Crate – HV micro controlled and distribution system located in ATLAS service cavern (USA15)
  - HV\_OPTO – distribution located in the calorimeter
- LV Distribution system
  - Expected new controller board → design/development of new DCS

# Forward Detectors DCS

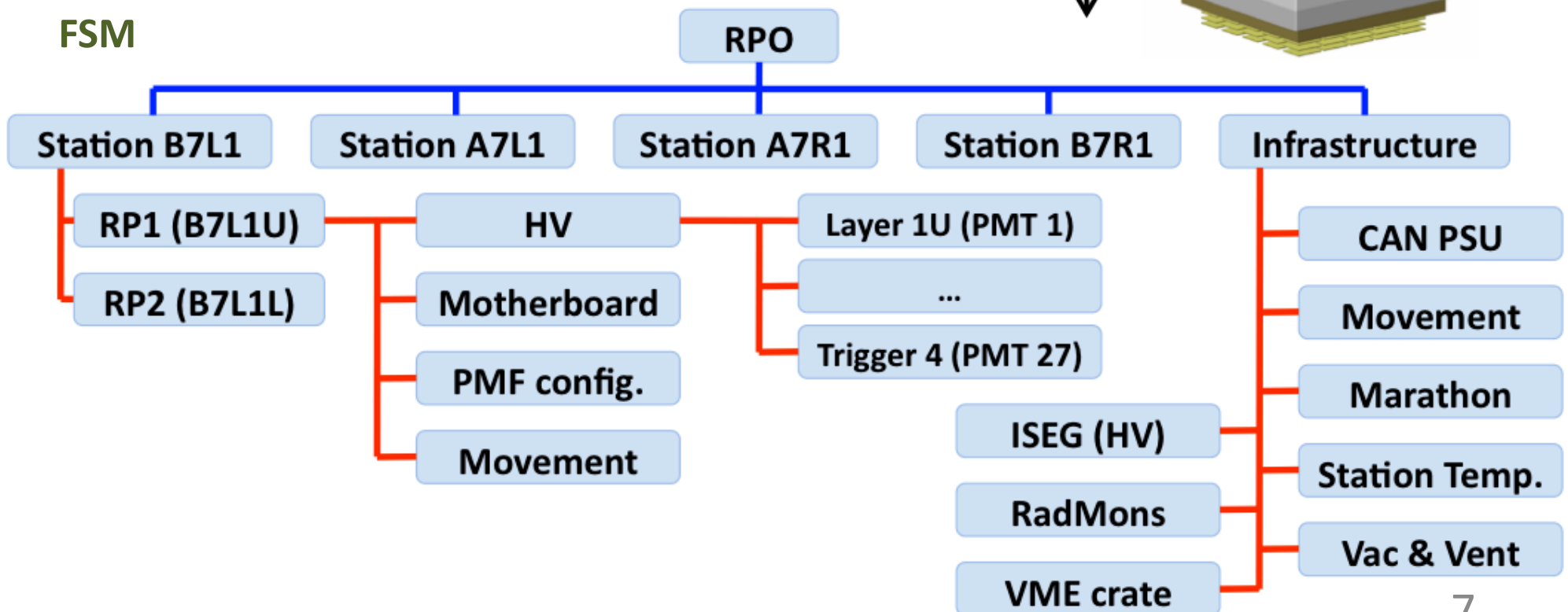
# ALFA Detector

## Detector system

- Detect scattered protons at small angles ( $\mu\text{rad}$  scale)
- Two stations on each side of the IP (240m)
- Each detector inside a Roman Pot
- Move closer/away from the beam
- Scintillator optical fibers connected to PMTs



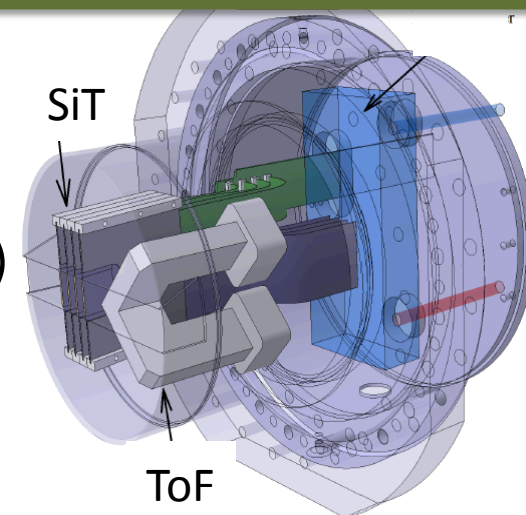
## FSM



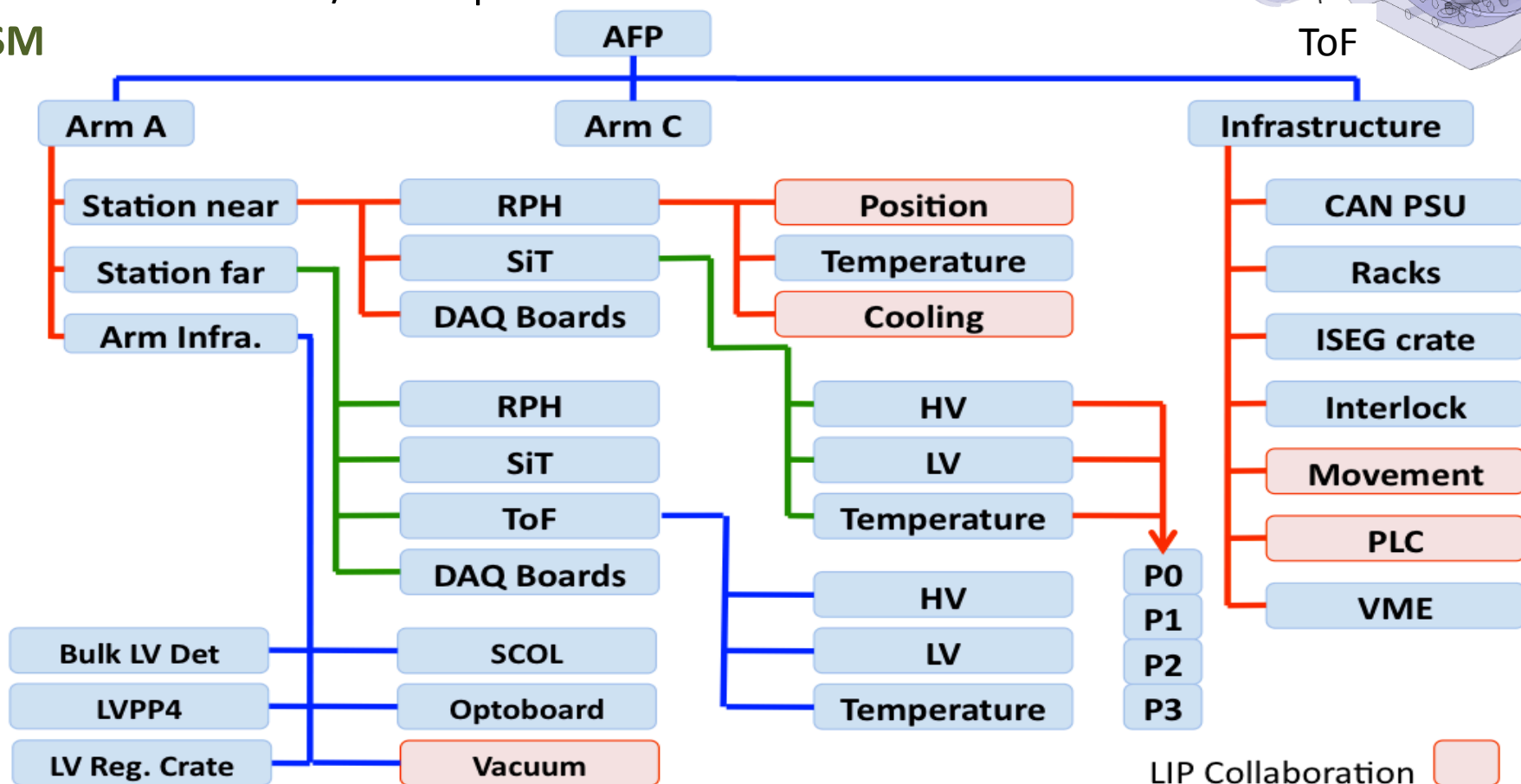
# ATLAS Forward Proton (AFP) NEW

## Detector system

- Two stations on each side of the IP (205 and 217m)
- Station near the IP -> Silicon tracker detector (SiT)
- Station far from the IP -> SiT and a Time-of-Flight detector (ToF)
- Each detector inside a Roman Pot
- Under installation/development



## FSM



# Summary

- The Detector Control System provides control and monitoring of several components and ensures the safe operation of the detector contributing to good Data Quality
- The Detectors DCS here described include a large variety of different systems successfully integrated in the ATLAS detector
- LIP is the main responsible group for the TileCal and ALFA DCS and contributes to the AFP DCS systems
- LIP participation in the sub-detectors DCS is essential for the global ATLAS DCS

## Acknowledgements

