Latest projects from ALBA's Operations group

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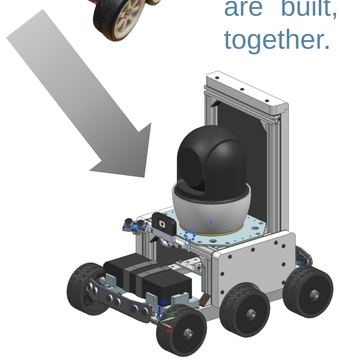
Abstract

ALBA is a 3 GeV, 3rd generation, synchrotron light source located in Barcelona (Spain), which is operating with users since May 2012. ALBA provides more than 4.000 hours of beam time per year to eight operational beamlines. Additionally, two beamlines are in commissioning and three in construction. The Operator's group is composed of eight operators and their career profiles are wide ranging. Operators shift load is about 50% of their time. The other 50% is devoted to give support to other accelerators groups, as for example Beam Diagnostics or RF, and develop projects to ease the operation. Here we present an overview of these projects. These include Python and MATLAB scripts and GUIs to take/analyze data to investigate incidences or do some calculations for the different accelerator's groups, a survey robot or new operation procedures, among others.

ALBA accelerators tunnel survey robot

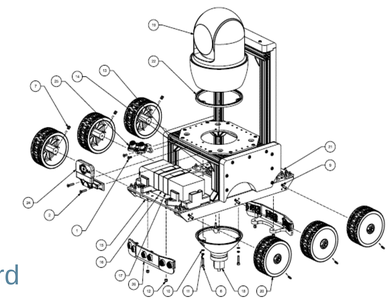
A first prototype is developed to test the concept. The robot systems, such as: movement, camera/s, remote control, net connections, sensors..., are built, integrated and made work together.

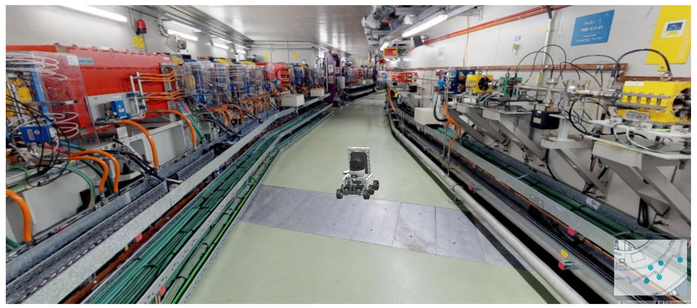


Then, a second, more robust version of it, is needed to allocate a survey camera and radiation shielding.

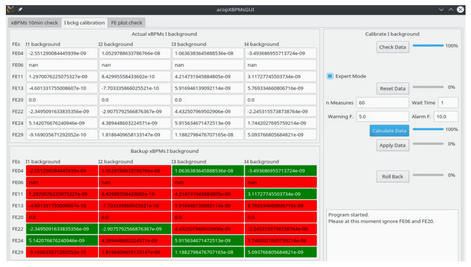
In production phase

- 18% of the parts list 3D printed in-house.
- 24% of the parts list "traditional" machined in-house.
- Of which, 33% are standard hardware stuff.



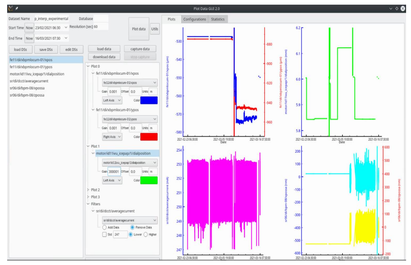


Diagnostic tools for the accelerator



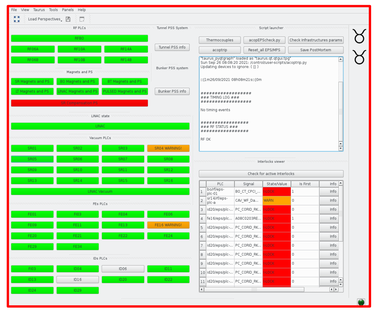
acopXBPMsGUI.py
- Calibrate xBPMs background currents.
- Check xBPMs stability.
- Backtrack errors.

acopPlotDataGUI.py
- Download data from Archiving.
- Capture from Tango control system.
- Filter and process.
- Plot data.



ALBA Equipment Protection System (EPS) user GUI

Migration from the expert version of EPS GUI to a user friendly GUI, with some extra improvements, based on operators experience to simplify the diagnose process of incidences.



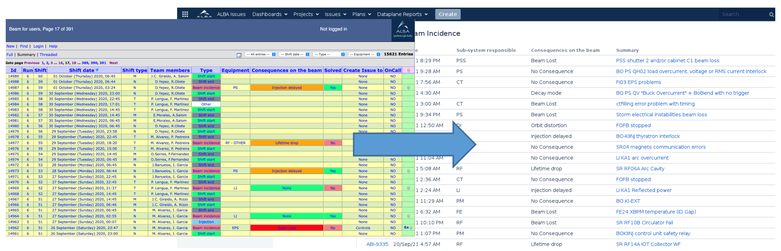
- Parameter checker & status backup for incidence tracking

- Fast link to trends and to procedures for incidences solving

- Temperature surveillance along the machine

Elog to Jira migration for reporting incidences

- A python webscraper to read old Elog incidences and save them in json files.
- A python script to import the json files and generate the new Jira Incidences automatically



- Easy report generation, filters,…
- Linked to other jira queues: issues / reports/ intervention orders of other subsystems

Equipment Protection System testing procedures

Input data
- Digital/analog settings at vacuum controllers
- Cooling water and air stops.
- Thermocouple controlled temperature heating.

Expected outcome
- Beam kill PLC's signals
- Injection stop
- Magnets racks stop.
- Vacuum valves closed
- Shutters closed

Tests execution
- Shutdown water & air cuts
- Python scripts forcing signals.
- Manual heating thermocouples and thermal switches

Current / computed comparison
- Summer shutdown water and air cuts.
- Python scripts forcing signals.
- Manual heating thermocouples and thermal switches