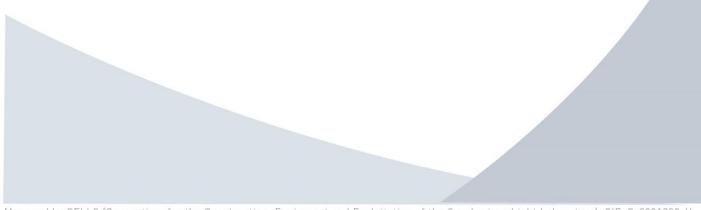Título puesto: Fast Orbit Feedback upgrade development
Curso: 2023-24
División: Aceleradores/Informática

Descripción del proyecto:

- The beam stability of the ALBA storage ring is guaranteed by the Fast Orbit FeedBack (FOFB) system. The beam position is now measured by Beam Position Monitor (BPMs), read by a FPGA and sent to a CPU that calculates the orbit correction. Finally, results are sent to correctors magnet power supply at a frequency of 10 KHz.

- The whole system is now working for 10 years but part of the components is getting obsolete and an update of the control hardware including the FPGA is needed. This upgrade foresees the development of many modular pieces of code for the new FPGA.

- The student will take care of the development of the communication protocol between the FPGA and the power supply. This first part will provide a critical step toward the bypass of obsolete components that are now in the system and might be tested on the ALBA machine.

- In a second stage, the student will also contribute to the code that provides communication between the Beam Position Monitors and the FPGA.

Perfil del estudiante:

Student profile: Electronics engineering, Telecommunication engineering or Physics student

Requirements:

- Knowledge of FPGA and FPGA programming language (VHDL preferred)
- Knowledge of other programming languages (python, C) will be valued.
- Good level of spoken and written English.

Program:

- Introduction to Fast Orbit FeedBack system.
- Development of the power supply communication protocol in the FPGA.
- Development of the BPM-FPGA communication protocol.
- Validation of the code.
- Documentation of the project.

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