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Real-time embedded feedforward correction for SIRIUS undulators

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SIRIUS, the Brazilian 4th generation synchrotron light source, has been in operation since 2020. Over time, insertion devices (IDs) are expected to populate its straight sections. To suppress edge effects from undulators and support overall beam stability, a feedforward correction system is currently available through EPICS layer for the first installed ID. However, performance could be improved by adopting a lower-level solution with higher actuation rates and reduced jitter.

To address this, a new approach has been developed using hardware technology already available: control system nodes based on BeagleBone Black platform, which integrates both embedded linux and dedicated real-time processors within the same SoC. This setup enables current setpoints updates at rates up to 1 kHz and aiming to be scalable. This paper presents an overview of the system's architecture and objectives, first results with IVU and VPU undulators as well as future developments and improvements.

Footnotes

Funding Agency

I have read and accept the Conference Policies

Yes

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