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UPGRADE OF HALL PROBES BENCHES FOR CRYOGENIC UNDULATOR BASED-ON SAFALI SYSTEM AT SOLEIL

The rise of cryogenic undulators requires an adaptation of their measurement benches. The constraints of vacuum, space, and temperature compel us to modify our benches in terms of their configurations and components.

The new Hall probe bench that will be tested on the CPMU12 currently under construction at Soleil is Based on the SAFALI (Self-Aligned Field Analyzer with Laser Instrumentation) System presented at FEL 2007 for IVU24 and CPMU prototype at Spring-8 [1].

This system digitally corrects the position and angle of the Hall probe in Igor Pro, using an active feedback loop that controls piezoelectric motors to adjust the probe's position. At present, it cannot be characterized outside of the vacuum, as air inhomogeneities cause deviations in the laser beam. The alignment of the laser beams with the other components of the bench has been automated in Python, due to the instability and lack of precision in the manual approach. Initially, the alignment of the probe axis with the electron axis of the undulator was to be ensured by installing fixed irises as references on the undulator chassis. However, this option was abandoned due to space constraints in the vacuum chamber.

In addition, the cinematic of the bench has also evolved from an out-vacuum stepper motor with a metallic belt driving the Hall probe to a linear motor that can be directly embedded in the vacuum chamber to fulfill measurements under vacuum and cryogenic conditions. This configuration should enable to reach better performances mainly a better stability in terms of velocity.

References

[1] T. Tanaka, T. Hara, R. Tsuru, D. Iwaki, X. Marechal, T. Bizen, T. Seike and H. Kitamura SPring-8, Koto 1-1-1, Mikazuki, Sayo, Hyogo 679-5148, Japan, IN-VACUUM UNDULATORS, Proceedings of the 27th International Free Electron Laser Conference (2005)

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