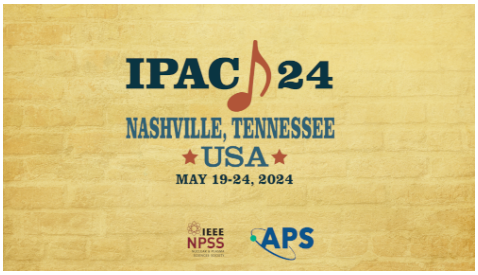

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Upgrade of the SPARC_LAB low level radiofrequency system

Thursday, 23 May 2024 16:00 (2 hours)

SPARC_LAB facility was born in 2004 as an R&D activity to develop a high brightness electron photo-injector dedicated to FEL experiments and exploration of advanced acceleration techniques. The electron source consists in a brazefree 1.6-cell S-band RF gun with a peak electric field of 120 MV/m and a metallic copper photocathode. The gun injects particles into two S-band sections, the initial section acting as an RF compressor using the velocity bunching technique, with built-in solenoid coils that enhance magnetic focusing and control emittance. A subsequent C-band acceleration section acts as a booster to achieve the desired kinetic energy. The Lazio Regional government recently funded the SABINA project for the consolidation of SPARC_LAB facility. The reference and the distribution systems and the Low Level radiofrequency (LLRF) system will also undergo a significant upgrade, involving the replacement of the original analogue S-band and digital C-band radiofrequency systems with commercial, temperature-stabilized, FPGA-controlled LLRF digital systems provided by Instrumentation Technologies in order to improve performance in terms of amplitude, phase resolution, and stability.

Footnotes

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