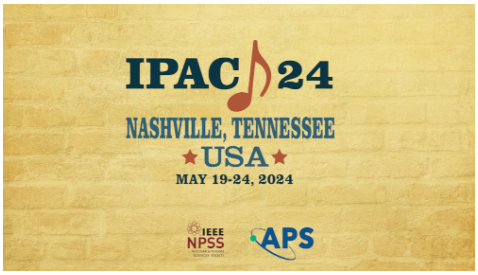

Contribution ID: **1942** Contribution code: **THPC44** Type: **Poster Presentation**

Broadband impedance induced heating proxy for operation at higher total current at SIRIUS

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

SIRIUS is a 4th generation synchrotron light source built and operated by the Brazilian Synchrotron Light Laboratory (LNLS), in Campinas, Brazil. Currently, SIRIUS storage ring operates in top-up mode at 100 mA in uniform fill. The main limiting factor for reaching higher currents is the temporary RF system in use. It is comprised of one PETRA VII-Cell cavity and two solid state amplifier towers that, combined, provide at most 120kW of power. By mid 2024, two superconducting RF cavities will replace the current cavity and two amplifier towers will be added to the system, allowing operation at higher currents. The design current of SIRIUS storage ring is 350 mA, which can only be achieved once a third harmonic cavity is installed to lengthen the bunches to avoid excessive wake-induced heating of sensitive components. However, the installation of such cavity is not foreseen in the near future, which raises the question of which is maximum current in uniform fill SIRIUS can be operated. This work will present some theoretical and experimental studies carried out to answer this question.

Footnotes

Funding Agency

Paper preparation format

LaTeX

Region represented

North America

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Session Classification: Thursday Poster Session

Track Classification: MC5: Beam Dynamics and EM Fields: MC5.D04 Beam Coupling Impedance Theory, Simulations, Measurements, Code Development