



Contribution ID: 45

Type: Poster

Beam-Based Voltage Calibration for Double-Harmonic RF Systems in the CERN Super Proton Synchrotron

Tuesday, 29 October 2024 16:40 (1h 50m)

Accurate knowledge of the voltage and phase in an RF cavity gap is essential to preserve beam quality and to achieve efficient, precise real-time correction with LLRF feedback. Voltage calibration using longitudinal phase-space tomography is a well-established beam-based technique that has demonstrated remarkable precision in determining the RF voltage experienced by a particle bunch. In a double-harmonic RF system, beam-based voltage calibration involves minimizing a four-dimensional parameter space that depends on the phase-voltage parameters of both RF systems. This process can be computationally challenging, and it is often more practical to perform a sequence of two-parameter voltage measurements, referencing the higher-order cavity system with respect to the main one. The Super Proton Synchrotron (SPS) at CERN is equipped with 200 MHz and 800 MHz cavity systems, that operate in phase at the bunch position for a non-accelerating bucket. In this context, the latest beam-based voltage calibration campaign conducted in the SPS will be presented, comparing different approaches.

Primary author: INTELISANO, Leandro (CERN)

Co-authors: QUARTULLO, Danilo; PAPOTTI, Giulia (CERN); DAMERAU, Heiko (CERN)

Presenter: INTELISANO, Leandro (CERN)

Session Classification: Poster Session II (Measurement and calibration)

Track Classification: Measurement and calibration