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## Beam-cavity interaction in the CERN PS 80 MHz RF systems

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

The 40 MHz and 80 MHz Radio Frequency (RF) systems in the CERN Proton Synchrotron (PS) are required to perform non-adiabatic bunch shortening before beam ejection. This manipulation allows to fit the bunches into the short RF buckets of the 200 MHz Super Proton Synchrotron (SPS). Although the impedance of the cavities is strongly reduced by feedback, the detailed understanding of the beam-cavity interaction is essential to evaluate their impact on the beam. This contribution focuses on the impedance characterization of the 80 MHz RF systems to describe how the RF amplification chain behaves as a function of beam current changes. Complementary measurement techniques, both beam and RF-based, were adopted. The results of the different measurements show good agreement. The aim is to study and predict possible beam quality degradation at beam intensities required by the High Luminosity LHC (HL-LHC), as well as to propose future consolidation to the high-frequency RF systems in the PS.

### Footnotes

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### Paper preparation format

LaTeX

### Region represented

Europe

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