



Contribution ID: 513 Contribution code: WEPG31

Type: **Poster Presentation**

Experimental and simulated LHC Schottky spectra

Wednesday, 22 May 2024 16:00 (2 hours)

Schottky monitors are valuable non-invasive tools used for beam diagnostics, providing insights into crucial bunch characteristics such as tune, chromaticity, bunch profile, or synchrotron frequency distribution. This study investigates Schottky spectra at the Large Hadron Collider (LHC) through a combination of simulations and measurements. Experimental data from lead ion bunches are compared with simulated spectra derived from time-domain, macro-particle simulations.

In particular, amplitude detuning due to the octupole magnets, known to influence the Schottky spectra, is incorporated into the simulations. These simulations are performed for various octupoles currents with the goal of better understanding the interplay between octupoles and the Schottky spectrum. Finally, measured spectra are compared to simulations performed using the best available knowledge of the parameters impacting the spectra.

Footnotes

Funding Agency

Paper preparation format

LaTeX

Region represented

Europe

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Session Classification: Wednesday Poster Session

Track Classification: MC6: Beam Instrumentation, Controls, Feedback, and Operational Aspects: MC6.T03 Beam Diagnostics and Instrumentation