



Contribution ID: 1172 Contribution code: WEPL150

Type: **Poster Presentation**

## **Characterization of the longitudinal beam coupling impedance and mitigation strategy for the fast extraction kicker KFA79 in the CERN PS**

*Wednesday, 10 May 2023 16:30 (2 hours)*

In the framework of the High Luminosity Upgrade of the LHC (HL-LHC) the beam intensity from the injectors must be doubled while keeping longitudinal beam parameters unchanged. As such, high-quality beams with high intensities are required also from the Proton Synchrotron (PS). The beam coupling impedance plays a crucial role and mitigation measures must be taken to remain within a stringent impedance budget. Kicker magnets are important contributors to the overall broadband impedance of the PS. Moreover, the detailed study of kicker impedances revealed additional resonant modes which may be critical for the beam stability. The longitudinal beam coupling impedance for the fast extraction kicker KFA79 is presented in this study, and a solution to reduce the impedance of the critical resonant modes is introduced. Electromagnetic (EM) simulations have been performed to determine the impedance behaviour. Finally, the insertion of transition pieces between magnet modules is presented as a measure for mitigating the low frequency resonant impedance contributions.

### **Funding Agency**

### **Footnotes**

### **I have read and accept the Privacy Policy Statement**

Yes

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**Session Classification:** Wednesday Poster Session

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