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Transverse beam coupling impedance studies at the CERN Proton Synchrotron Booster after the LHC Injectors Upgrade

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After the LHC Injectors Upgrade (LIU) project, the CERN Proton Synchrotron Booster (PSB) operates with a new injection kinetic energy of 160 MeV and an extraction energy of 2 GeV. In light of this, several measurements have been performed to characterize the behaviour of the accelerator in terms of beam stability and beam coupling impedance in the new energy range. In particular, the horizontal instability observed in 2021 at about 1.7 GeV (between the old and the new extraction energy) has been deeply investigated and betatron coherent tune shift measurements have been carried out to further benchmark the PSB transverse beam coupling impedance model. Regarding the horizontal instability, although a mitigation strategy has been identified, measurements and studies have been conducted to understand and explain its source.

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Footnotes

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Yes

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