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Tail population studies in the CERN PS

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The beam quality in terms of the transverse beam profiles from the CERN injectors plays a crucial role for the luminosity production at the LHC. Transverse tails beyond a Gaussian distribution have been observed in all the LHC injectors and efforts to optimize them are ongoing, as they can perturb operations due to large losses at LHC injection. At the CERN Proton Synchrotron (PS), measurements with various beam parameters and at different points along the cycle have been conducted to identify the source of the additional tails' population. Transition crossing was identified as the most critical point in the shaping of the profiles. Consequently, measurements of the optics perturbations during the gamma jump have been conducted. Simulations of the full transition crossing process including space charge effects have also been performed to fully characterize the effects.

Footnotes

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Paper preparation format

LaTeX

Region represented

Europe

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