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Effects of beam plane correlation on injection efficiency

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The effectiveness and efficiency of a beam injection scheme is crucial to achieve high beam intensities while minimizing possible beam losses. The classical method for injecting from a linac to a synchrotron is the multi-turn injection. In this scheme the quality of the injected beam as well as of the injection scheme depends on factors as beam emittance, type of local bump ramp, chromaticity, dispersion and beam intensity. This approach relies on the decorrelation between the planes of the injected beams. However, investigations on the beam coming from the linac have suggested the possibility that a beam correlation may exist*. We present here an investigation of the effect of a correlated beam on the efficiency of the multi-turn injection for several degrees of correlation.

Footnotes

*ROSE, MEASURING THE FULL 4D TRANSVERSE BEAM MATRIX OF ION BEAMS, M. Maier, X. Du, P. Gerhard, L. Groening, S. Mickat, H. Vormann, C. Xiao GSI, Darmstadt, Germany, Proceedings of IPAC2016, Busan, Korea

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