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Emittance and energy distribution reduction in the positron injector of FCC-e+e-

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The FCC-e+e- project foresees the realization of the most intense ever realized source of positrons providing a bunch charge of the order of 5 nC. This big number of positrons ($\approx 3.12 \times 10^{10}$) is produced by pair conversion following a 6 GeV electron beam bremsstrahlung on a target, and as a consequence has large divergence and energy spread. The actual design of the positron injector includes a damping ring and a bunch compressor to reduce the beam particle distributions in the longitudinal and transverse phase spaces to values appropriate for the injection in the common LINAC, which accelerates both electron and positron beams from 1.54 to 6 GeV. An energy compressor installed after the positron LINAC improves the positron acceptance in the damping ring. This contribution presents relevant aspects related to the damping of the positron beam including the evaluation of the damping ring transmission efficiency through the whole transfer line from the positron source to the common LINAC, the energy compressor, and the bunch compressor in the injection and extraction branches of the Damping Ring.

Footnotes

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LaTeX

Region represented

Europe

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