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Update in the optics design of monochromatization interaction region for direct Higgs s-channel production at FCC-ee

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The FCC-ee could allow the measurement of the electron Yukawa coupling via direct Higgs s-channel production at ~ 125 GeV center-of-mass energy, provided that the center-of-mass energy spread of this channel, can be reduced to about 5–10 MeV to be comparable to the width of the standard model Higgs boson. The natural collision-energy spread at 125 GeV, due to synchrotron radiation, is about 50 MeV. Its reduction to the desired level can be accomplished by means of monochromatization, e.g., through introducing non-zero dispersion of opposite sign at the Interaction Point (IP), for the two colliding beams. This nonzero dispersion in the IP (horizontal or vertical) could be generated by different methods, requiring or not modifications of the Final Focus System (FFS) Local Chromaticity (LOC) dipole system. In this paper we report and compare the different recent Interaction Region (IR) optics design of this new possible collision mode.

Footnotes

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