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Considerations for the transverse feedback system for the CERN FCC-ee collider ring

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The FCC-ee, a 90.7 km circumference e^+ and e^- collider under study at CERN, will require a transverse feedback system capable of handling risetimes as fast as four turns for the lowest order coupled-bunch modes. This can be realized by a distributed system of pick-ups and kickers in more than one location of the ring. The advantages are weighed with respect to the flexibility to respond to different choices of transverse tune working points and the possibility to operate the transverse kickers as an exciter for several measurement applications including as a depolarizer for energy calibration at Z and W energies. Options for the signal processing are outlined together with the overall specifications for the system components. The choice of frequency, a multiple of 40 MHz, is determined by requirements of the baseline 25 ns bunch spacing and the desire for a power efficient kicker system favoring stripline kickers. Performance of different variants of the system are compared in simulation and evaluated for added flexibility and complexity with respect to the placement in the ring.

Footnotes

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