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Study status of Beam Backgrounds and MDI Design at the CEPC

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The machine-detector interface (MDI) issues are one of the most complicate and challenging topics at the Circular Electron Positron Collider (CEPC). Comprehensive understandings of the MDI issues are decisive for achieving the optimal overall performance of the accelerator and detector. The machine will operate at different beam energies, therefore, a flexible interaction region design will be plausible to allow for the large beam energy range. The design has to provide high luminosity that is desirable for physics studies, but keep the radiation backgrounds tolerable to the detectors. This requires careful balance of the requirements from the accelerator and detector sides.

In this talk, the latest design of the CEPC MDI based on CEPC Technical Design Report (TDR) will be presented, covering the design of the beam pipe and whole IR, the estimation of beam induced backgrounds, the mitigating schemes, and also our plan towards the Ref-TDR of CEPC detector and EDR of accelerator.

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