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Status and Perspectives for FCC-ee Detector Background Studies

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The electron-positron Future Circular Collider (FCC-ee) is a proposed high-energy lepton collider that aims to reach unprecedented precision in the measurements of fundamental particles. The high beam currents, with a top-up continous injection, and the high interaction
frequency produce machine induced backgrounds in the detector, especially at the Z peak energy. This contribution presents a study of the beam-induced backgrounds at FCC-ee.
Two main categories of backgrounds are considered reaching the detector: the single-beam related, such as synchrotron radiation and beam gas, in which photons or electrons survive the collimation and absorber system, and the luminosity backgrounds, originating
at the collision point, like the incoherent pair creation or the radiative Bhabha, with high cross-sections. In addition, to allow for high beam intensity the beam is continuously injected, potentially leading to induce backgrounds in the detector, thus giving feedback on the best injection schemes. The beam induced backgrounds are simulated with GuineaPig++, BDSIM and X-Suite and are interfaced to the turnkey software Key4HEP to estimate the occupancy levels in the detector.

Secondary track

Authors:　BOSCOLO, Manuela (INFN-LNF);　KLUTE, Markus (KIT)

Presenter:　BOSCOLO, Manuela (INFN-LNF)

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