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Beam-induced background simulation studies for C^3

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The Cool Copper Collider (C^3) is a proposed linear electron-positron linear collider operating at a center-of-mass energy of 250 GeV, with an upgrade to 550 GeV. A key aspect of evaluating the physics potential of any proposed Higgs factory is to quantify the effect of the various beam- and machine-induced backgrounds on the detector occupancy, and, ultimately, on the expected precision reach. In this work, we present results for the effects of incoherent e^+e^- pairs and photoproduced hadrons from beamstrahlung, which were interfaced with the SiD detector concept geometry, originally developed for the International Linear Collider (ILC), using the DD4HEP toolkit. Our studies demonstrate that C^3 background rates are compatible with the SiD concept and enable further detector optimizations in order to maximize the precision of important measurements, e.g. the Higgs self-coupling. This highlights synergies between ILC and C^3 detector R&D efforts and shows the power of common software tools to enable physics studies for proposed future accelerators.

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