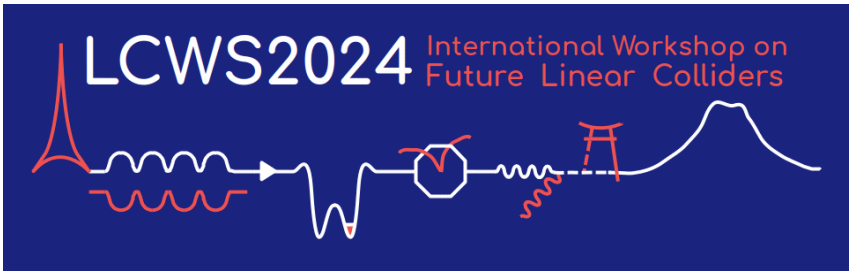

Contribution ID: **89** Type: **Oral presentation (in person)**

Beam-Induced Backgrounds at the Cool Copper Collider

Wednesday 10 July 2024 11:50 (15 minutes)

Beam-beam interactions constitute an important source of background at any electron-positron (e^+e^-) collider, generating the so-called beam-induced background (BIB), with important implications for the design and optimization of detectors at these machines and, ultimately, their physics reach. In this talk, we will present the latest results on the evaluation of the BIB at the Cool Copper Collider (C^3). We will begin with an overview of the various processes that contribute to the BIB at an e^+e^- machine and evaluate their relative rates. We will then present simulation results for the production rates and kinematics of the dominant processes at C^3, namely incoherent e^+e^- pair production and hadron photoproduction, and discuss technical challenges with these simulations, relevant for any e^+e^- machine. Finally, utilizing full detector simulation for the SiD detector concept, we assess the impact of these backgrounds on the occupancy of the various sub-detector systems, most notably the vertex detector, and evaluate the effects of variations in the bunch time-structure of the beams. Our results indicate that C^3 background rates are compatible with the SiD concept and enable further beam parameter and detector optimizations in order to maximize the precision of important measurements at C^3.

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