Contribution ID: **55** Type: **ORAL**

Out-of-Time Pileup Mixing for the C3 Collider Concept

Wednesday, 11 October 2023 16:40 (20 minutes)

The Cool Copper Collider (C^3) is a proposed linear electron-positron linear collider operating at a center-of-mass energy of 250 GeV, upgradable 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 particular, we are building on the dedicated simulations achieved thus far for incoherent electron and hadron production, as well as accelerator muon backgrounds to make detailed simulations of the C3 bunch structure. C3 has a bunch separation of 5.25ns in trains of 133 bunches, so out-of-time pileup is pertinent to understanding the cleanliness of the experimental environment and electronics design. In this study we demonstrate the progress we've made, using common Linear Collider software integrated in key4hep, on overlaying out-of-time pileup coming from incoherent electron pairs, and we evaluate the impact on the pixel occupancy per bunch coming from this effect looking in various time windows around the central bunch crossing.

Primary authors: VERNIERI, Caterina (SLAC); NTOUNIS, Dimitris (Stanford University & SLAC National Accelerator Laboratory); GRAY, Lindsey (Fermilab); ELIAS, Mettner (UW - Madison)

Presenter: GRAY, Lindsey (Fermilab)

Session Classification: Parallel - WG3