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A CLIC Post-Collision Extraction Line Photon Background Study

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In the proposed CLIC Extraction Line Design, coherently produced lepton pairs possess a significant energy distribution. In the bending region, this translates to high dispersion and possible particle loss. To prevent magnet damage, masks are positioned between the magnets to absorb these losses, of which this study analyses the effect of these lost particles. Using physics-in-matter simulation tools, these interactions are modelled and secondary particles are tracked. Photons produced in the backwards direction are identified and tracked back to the interaction point to determine the flux incident on the detectors. Of particular interest is the silicon vertex detector region since photons may trigger false signals, contributing to the backgrounds. This study will also look at the effects of detector masking, and the probability of an incident photon translating to a registered hit in the silicon.

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