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Reconstructing muons at a Muon Collider

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A Muon Collider represents a promising proposal for the future of particle accelerators. Lepton colliders, indeed, allow to probe much higher energy scales than hadrons with higher precision; in addition, the usage of muons guarantees a much lower level of synchrotron radiation than the electron case. However, a muon collider poses relevant technological challenges: worth to mention, at least, the production of a large number of muons in low emittance bunches and the need to deal with the Beam-Induced Background (BIB), i.e. background generated by muon decays.
In this context, a detailed simulation of the detector is mandatory to understand the feasibility of the experiment implementation. Currently a complete simulation, mostly inherited from the CLIC ILC software, is ongoing to understand the performance of the full detector.
The CLIC muon system foresees instrumenting the iron yoke plates with layers of track sensitive chambers in order to enhance the muon identification. The glass Resistive Plate Chambers technology has been adopted both for barrel and endcap region with readout cells of 30x30 mm^2. Alternative MicroPattern Gaseous Detector technologies are under investigation.
Simulated data of the particles reaching the muon chambers have been analyzed both for a single muon and multimuon final state processes, also including the BIB hits in the muon system.
This contribution will present preliminary studies of the muon reconstruction efficiency, BIB sensitivity and background mitigation giving a general overview of the muon spectrometer expected performance.

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