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Studies of Tracker Timing and Granularity for the Muon Collider Environment HANNSJRG WEBER, SERGO JINDARIANI, RON LIPTON, Fermilab, SIMONE PAGAN GRISO, Lawrence Berkeley National Laboratory, NAZAR BARTOSIK, INFN Torino, MASSIMO CASARSA, INFN Trieste, LAWRENCE LEE, Harvard University — The particle physics community is currently studying collider projects for the post-LHC era. Among those, muon colliders are particularly interesting due to their ability to reach multi-TeV energies in the environment typical for lepton colliders where backgrounds due to other physics processes are significantly lower than at a hadron collider experiment. However, as muons are unstable particles such a machine will be accompanied with technological challenges for a collider experiment: an unprecedented amount of secondary and tertiary decay products will enter the detector volume. The tracker, being closest to the muon beam, is most affected by this beam-induced background (BIB). Most reconstructed hits in the tracker are expected to come from the BIB. In this talk, we will discuss how the BIB can impact the occupancy of a tracker at a muon collider experiment and demonstrate how precision timing information and spatial granularity of such a tracker can be used to keep the occupancy at an acceptably low level that will allow proper reconstruction of the tracks.

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