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Physics Object reconstruction optimization at Muon Collider within the ILCSoftware NAZAR BARTOSIK, INFN Turin, PAOLO ANDREETTO, ALESSIO GIANELLE, LORENZO SESTINI, INFN Padua, MASSIMO CASARSA, INFN Trieste, LAURA BUONINCONTRI, University and INFN of Padua, CHIARA AIME', CRISTINA RICCARDI, University and INFN of Pavia, FEDERICA LEGGER, INFN Turin, TOVA HOLMES, University of Tennessee, PAOLA SALA, INFN Milano, KARRI DIPETRILLO, CHRISTIAN HERWIG, LESYA ANNA HORYN, Fermilab, STEFAN SPANIER, University of Tennessee — The ILCSoft framework, developed for the International Linear Collider and later for CLIC, is now a backbone of the full-simulation studies at a Muon Collider. In contrast to electron-positron colliders, where this framework has been mostly used, a number of computational challenges have to be faced in the Muon Collider environment. The main reason for the increased simulation and reconstruction complexity is the presence of an unprecedented amount of beam-induced background particles arriving to the detector region in a single bunch crossing due to the unstable nature of muons. Performing a full simulation and reconstruction of all the particles is high CPU time consuming, but the distinct temporal and spatial distributions of this background allow to strongly reduce the amount of computation spent on irrelevant object reconstruction. This contribution presents a series of optimisations to the detector simulation workflow, tracker and calorimeter hits digitization as well as track and particle-flow reconstruction sequence taking into account the characteristic properties of the beam-induced background.

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