Abstract

This thesis presents a review of the simulations done for studying the radiation environment in CMS detector at LHC. Although the tracker and pixel detector regions were the focus of our study, but we also obtained valuable information for the calorimeters and muon system as well. MARS15 code was used to carry separate simulations to study the contribution from proton-proton interaction, beam-gas interaction and the beam halo towards the radiation field in the CMS. We have also simulated couple of the possible accidental scenarios and tried to assess the possible damage potential for the either case. The other part of the thesis begins with a brief discussion of particle flow algorithm and SUSY searches in the early data. We have analyzed in detail the standard model production of the Z bosons in association with one or more jets, since it is the most important standard model background for our channel. We have evolved a novel method based on the Z-Jet balance to estimate the background component in final selection. Details for the commissioning exercise and the preliminary results from searches using $36\text{pb}^{-1}$ of the data collected in year 2010 are presented.