

Simulation study for the electromagnetic calorimeter trigger system of the Belle II experiment

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The Belle II experiment using the SuperKEKB energy-asymmetric e+e- collider at KEK in Japan started physics data-taking from 2018. In the Belle II operation, the Electromagnetic Calorimeter (ECL) trigger system was very crucial to operate the trigger/DAQ system. The ECL trigger simulation package has been prepared based on the Belle II Geant4-based analysis framework called Basf2. By the simulation tool, various ECL trigger logics were developed and confirmed by the intensive simulation study. So far, the ECL trigger system has been stably working from the early stage of the experiment. However, severe beam background is anticipated in the future due to a dramatic increase of instantaneous luminosity, so the background level should be estimated. Moreover, the simulation module should be upgraded to give more realistic predictions. In this report, we describe a background overlay simulation study and simulation module updates as well.

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