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Status of the Belle II simulation library

Author: Doris Yangsoo Kim

1 Soongsil University

Corresponding Author: dorisykim@ssu.ac.kr

The SuperKEKB collider and the Belle II experiment started Phase III at the beginning of 2019. The run is designed to collect a data sample of up to 50/ab at the collision energy of the Upsilon(4S) resonance for the next decade. The Belle II software library is created to ensure the accuracy and efficiency needed to accommodate this next generation B factory experiment.

The central component of the Belle II simulation library is Geant4, which is one of the most popular software packages used by high energy experiments. In this talk, we will summarize the current status of the simulation library and will review the efforts to optimize the Geant4 functionalities in the Belle II specific environment. The discussed topics will include the optimization of the physics list and upgrade to Geant4 version 10.5.

Consider for promotion:

No

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Trigger level analysis technique in ATLAS for Run 2 and beyond

Author: Caterina Doglioni

1 Lund University (SE)

Corresponding Author: caterina.doglioni@cern.ch

With the unprecedented high luminosity delivered by the LHC, detector readout and data storage limitations severely limit searchs for processes with high-rate backgrounds. An example of such searches is those for mediators of the interactions between the Standard Model and dark matter, decaying to hadronic jets. Traditional signatures and data taking techniques limit these searches to masses above the TeV. In order to extend the search range to lower masses on the order of 100 GeV and probe weaker couplings, the ATLAS experiment employs a range of novel trigger and analysis strategies. One of these is the trigger-level analysis (TLA), which records only trigger-level jet objects instead of the full detector information. This strategy of using only partial event information permits the use of lower jet trigger thresholds and increased recording rates with minimal impact on the total output bandwidth. We discuss the implementation of this stream and its planned updates for Run 3 and outline its technical challenges. We also present the results of an analysis using this technique, highlighting the competitiveness and complementarity with traditional data streams.

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