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Fast simulations with ALICE 3

The 'ALICE 3' project is a proposed upgrade of the ALICE detector, which involves a complete replacement of the installation at Point 2. Crucial to the physics programme are high-precision measurements of heavy-flavour observables that require large data samples as well as state-of-the-art tracking performance. As a consequence, performance studies of the operating conditions of ALICE 3 that employ full simulation chains are very computationally demanding, especially in what concerns particle transport and detector response simulation. In this context, finding alternative representations of certain steps of full simulations is extremely useful. Such techniques are called 'fast simulations' and reduce computing requirements by at least one order of magnitude.

In this work, we will present the current status of fast simulations of the ALICE 3 detector, including studies in which different tracker and particle identification setups are considered. We also elaborate on how current fast simulations make efficient use of resources by running entirely in physical memory and not storing anything except for the desired physics performance quantities. Lastly, we will discuss the performance study of multi-charm baryons, which is not computationally feasible with full simulations alone, as a test case of the fast simulation machinery.

Category

Experiment

Collaboration (if applicable)

ALICE Collaboration

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