Status of the Calibration and Alignment Framework at the Belle II Experiment

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The SuperKEKB e^+-e^- collider
has now completed its first turns. The planned running luminosity
is 40 times higher than its previous record during the KEKB operation.
The Belle II detector placed at the interaction point will acquire
a data sample 50 times larger than its predecessor. The monetary and
time costs associated with storing and processing this quantity of
data mean that it is crucial for the detector components at Belle II
to be calibrated quickly and accurately. A fast and accurate calibration
allows the trigger to increase the efficiency of event selection,
and gives users analysis-quality reconstruction promptly. A flexible
framework for fast production of calibration constants is being developed
in the Belle II Analysis Software Framework (basf2). Detector experts
only need to create two components from C++ base classes. The first
collects data from Belle II datasets and passes it to the second
stage, which uses this much smaller set of data to run calibration
algorithms to produce calibration constants. A Python framework coordinates
the input files, order of processing, upload to the conditions database,
and monitoring of the output. Splitting the operation into collection
and algorithm processing stages allows the framework to optionally
parallelize the collection stage in a distributed environment. Additionally,
moving the workflow logic to a separate Python framework allows fast
development and easier integration with DIRAC; The grid middleware
system used at Belle II. The current status of this calibration and
alignment framework will be presented.

Tertiary Keyword (Optional)

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Data processing workflows and frameworks/pipelines

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