Contribution ID: **137** Type: **Poster**

Belle II Conditions Database Interface

Tuesday, 22 August 2017 16:25 (20 minutes)

The Belle II experiment at the SuperKEKB e^+e^- accelerator is preparing for taking first collision data next year. For the success of the experiment it is essential to have information about varying conditions available in the simulation, reconstruction, and analysis code.

The online and offline software has to be able to obtain conditions data from the Belle II Conditions Database in a robust and reliable way under very different situations. As such the client side interface to the Belle II Conditions Database has been designed with a variety of access mechanisms which allow the software to be used with and without internet connection. Different methods to access the payload information are implemented to allow for high level of customization per site and to simplify testing of new payloads locally. The framework obtains objects from the back-end database only when needed and caches them during their validity. The mechanism also enables transparent handling of validity ranges which are smaller than the finest granularity supported by the database.

The user API to the conditions data was designed to make the life for developers as easy as possible. Two classes, one for single objects and one for arrays of objects, provide type-safe access. Their interface resembles that of the classes for the access to event-level data with which the developers are already familiar. Changes to the conditions data are usually transparent to the client code but users can actively check whether an object has changed or register callback functions to be called whenever a conditions data object is updated. In addition a command line user interface has been developed to simplify inspection and modification of the database contents.

The talk will present the design of the conditions database interface in the Belle II software, show examples of its application, and report about usage experiences in large-scale Monte Carlo productions and calibration exercises.

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Session Classification: Poster Session

Track Classification: Track 1: Computing Technology for Physics Research