

A new mechanism to persistify the detector geometry of ATLAS and serving it through an experiment-agnostic REST API

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The complex geometry of the whole detector of the ATLAS experiment at LHC is currently stored only in custom online databases, from which it is built on-the-fly on request. Accessing the online geometry guarantees accessing the latest version of the detector description, but requires the setup of the full ATLAS software framework "Athena", which provides the online services and the tools to retrieve the data from the database. This operation is cumbersome and slows down the applications that need to access the geometry. Moreover, all applications that need to access the detector geometry need to be built and run on the same platform as the ATLAS framework, preventing the usage of the actual detector geometry in stand-alone applications.

Here we propose a new mechanism to persistify and serve the geometry of HEP experiments. The new mechanism is composed by a new file format and a REST API. The new file format allows to store the whole detector description locally in a flat file, and it is especially optimized to describe large complex detectors with the minimum file size, making use of shared instances and storing compressed representations of geometry transformations. On the other side, the dedicated REST API is meant to serve the geometry in standard formats like JSON, to let users and applications download specific partial geometry information.

With this new geometry persistification a new generation of applications could be developed, which can use the actual detector geometry while being platform-independent and experiment-agnostic.

Tertiary Keyword (Optional)

Visualization

Secondary Keyword (Optional)

Software development process and tools

Primary Keyword (Mandatory)

Data model

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