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The Run 2 ATLAS Analysis Event Data Model

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During the LHC's first Long Shutdown (LS1) ATLAS set out to establish a new analysis model, based on the experience gained during Run 1. A key component of this is a new Event Data Model (EDM), called the xAOD. This format, which is now in production, provides the following features:

- A separation of the EDM into interface classes that the user code directly interacts with, and data storage classes that hold the payload data. The user sees an Array of Structs (AoS) interface, while the data is stored in a Struct of Arrays (SoA) format in memory, thus making it possible to efficiently auto-vectorise reconstruction code.
- A simple way of augmenting and reducing the information saved for different data objects. This makes it possible to easily decorate objects with new properties during data analysis, and to remove properties that the analysis does not need.
- A persistent file format that can be explored directly with ROOT, either with or without loading any additional libraries. This allows fast interactive navigation without additional overheads, while maintaining the possibility of using the interface EDM to its full potential. Both compiled C++ or interactive Python code can be used after loading a minimal set of libraries.

The presentation will describe the design of the xAOD data format, showing the first results on reconstruction and analysis performance.

Summary

A presentation of the ATLAS Analysis Event Data Model (xAOD) developed for LHC's Run 2.

Authors: BUCKLEY, Andy (University of Glasgow (GB)); KRASZNAHORKAY, Attila (CERN); GILLBERG, Dag (CERN); MOYSE, Edward (University of Massachusetts (US)); KOENEKE, Karsten (Albert-Ludwigs-Universitaet Freiburg (DE)); NOWAK, Marcin (Brookhaven National Laboratory (US)); ELSING, Markus (CERN); Dr VAN GEMMEREN, Peter (Argonne National Laboratory (US)); SNYDER, Scott (Brookhaven National Laboratory (US)); EIFERT, Till (SLAC National Accelerator Laboratory (US))

Presenter: NOWAK, Marcin (Brookhaven National Laboratory (US))

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