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Analysis preservation in the heavy-ion world

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The comparison of experimental data and theoretical predictions is crucial for our understanding of the mechanisms for interactions and particle production in hadron collisions, both at the Large Hadron Collider (LHC) and at the Relativistic Heavy-Ion Collider (RHIC). In order to help with that task, several tools were created. The Rivet (Robust Independent Validation of Experiment and Theory) framework is used as a generator-independent system for event generator validation and tuning. It provides a large set of experimental analysis algorithms (called plugins) going along with the published data. It uses the HepMC package as a common interface for events produced with different Monte Carlo generators, as well as YODA (Yet more Objects for Data Analysis) for histogramming. On top of that, the MCPLOTS framework has been and is still developed in order to automatize the creation of comparison plots and to make them accessible to everyone in the form of an online repository. These tools not only help with a comparison of different generators and experimental data but also with the preservation of the MC analysis algorithms used.

Analysis algorithm preservation offers many benefits for physicists, as well as for particle physics experiments. Preservation is essential for many reasons, such as to ensure post-publication reproducibility of the results. The heavy-ion community at large, including the ALICE Collaboration and the heavy-ion community at RHIC together with Rivet authors, is actively working on the preservation of the analyses containing some specific heavy-ion functionalities, such as centrality calibration. In this contribution, we will present the status of the developed tools and some of the open points and challenges still to be faced.

Preferred track

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