



Contribution ID: 50

Type: **not specified**

Rivet as an experiment-theory interface for the heavy-ion community

Monday, November 18, 2019 4:10 PM (30 minutes)

The comparison of experimental data and theoretical predictions is crucial for our understanding of the mechanisms for particle production and interactions in hadron collisions at the LHC. The Rivet (Robust Independent Validation of Experiment and Theory) framework was developed for this purpose and 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. Thus, Rivet allows a direct comparison of different generators and experimental data, as well as the preservation of the MC analysis algorithms used.

Originally developed for validation and tuning of models in high energy physics in pp(bar) and ee collisions, Rivet did not fulfill the requirements of many of the heavy-ion analyses: the latter require features like in-situ calibration steps, comparisons of AA and pp collisions, and binning in global event observables. A dedicated effort of the ALICE collaboration together with the Rivet core team and theorists resulted in the first Rivet release with heavy-ion functionalities. It provides the mentioned features as well as more than 10 analyses implemented as heavy-ion plugins using these features. While the development of Rivet is continuing in order to deal with other conceptual and technical difficulties of such analyses, it already provides an interface for the heavy-ion community to start writing their own analysis plugins.

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Session Classification: Heavy Ions

Track Classification: Heavy Ions