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Contribution ID: **3836** Type: **Oral Competition (Graduate Student) / Compétition orale (Étudiant(e) du 2e ou 3e cycle)**

(G*) A simultaneous measurement of 24 observables in Z+jets events using the ATLAS detector

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In order to make new discoveries within the realm of particle physics it is imperative that we are able to compare data collected using the ATLAS detector with theoretical predictions as well as results from other experiments. The process of correcting ATLAS data such that the effects of the detector are eliminated is known as unfolding. At present, commonly used unfolding methods require data to be binned and are typically performed with low dimensionality. With recent advances in machine learning, however, it has become possible to perform unfolding with unbinned, high dimensional data. The method examined here, known as the OmniFold technique, utilizes iteratively trained neural networks to accomplish this task. In this presentation, the results for the first unbinned, 24 dimensional measurement with full uncertainties is shown. This measurement is performed using the full Run 2 proton-proton collision dataset recorded by the ATLAS detector and examines Z+jets events where the Z boson decays to two muons. Various observables related to the dimuon kinematics, track jet kinematics and track jet substructure are included in the unfolding. A select number of observables that may be derived after the unfolding are also examined.

Keyword-1

High-Energy Collider Physics

Keyword-2

Machine Learning

Keyword-3

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