Contribution ID: **11** Type: **Poster**

Comparison of different ML methods applied to the classification of events with ttbar in the final state at the ATLAS experiment

This contribution describes the experience with application of different ML methods to a physics analysis case. The use case chosen has been the classification of ttbar events coming from BSM or from SM and we have taken the datasets provided in a repository of simulated events. The features of these events are represented by their kinematic observables.

The initial objective was to compare different methods in order to see whether it can lead to an improvement in the classification, but the work has also helped us test many variations in the methods by changing hyper-parameters, using different optimizers, ensembles, etc. With this information we have been able to conduct a comparative study that is useful for ensuring as complete control as possible of the methodology.

In the second stage we have incorporated variables from the reconstruction of the events and the substructure of jets in order to evaluate improvements in the classification.

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Track Classification: 1: Machine learning, algorithms and theoretical analysis