Machine Learning Methods in high jet multiplicities

Friday 13 September 2024 09:07 (7 minutes)

The four-top quarks (4tops) production in proton-proton collisions is one of the highest energy processes accessible at LHC and it was first observed by ATLAS and CMS collaborations in 2023. At ATLAS, it was measured in decay channels containing at least one leptonic decay of top quark, while leaving the all-hadronic channel unexplored. The 4tops production is very sensitive to Beyond Standard Model phenomena, therefore it is important to explore it also in the all-hadronic channel. This channel is characterised by very high jet count - 12. In this talk the machine-learning approaches for Signal and Background separation, kinematic reconstruction of top quarks, data-driven background estimation studies will be presented. SPANet, a Symmetry Preserving Attention Networks is explored. This is a promising tool for fast offline reconstruction of event topologies.

Summary

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