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A new tagger for hadronically decaying heavy particles at the LHC

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We present a new algorithm developed for the identification of boosted heavy particles at the LHC, the Heavy Object Tagger with Variable R (HOTVR). The algorithm is based on jet clustering with a variable distance parameter R combined with a mass jump condition. The variable R approach adapts the jet size to the transverse momentum p_T , resulting in smaller jets for increasing values of p_T , making the jet mass less susceptible to radiation. Two and three prong decays are identified using subjets, formed by the mass jump condition. The resulting algorithm combines the jet clustering, subjet finding and rejection of soft clusters in one step, making it robust and simple. We present performance tests for the identification of boosted top quarks, which show that the HOTVR algorithm has similar or better performance over a large range in p_T compared to other algorithms commonly used at the LHC.

Summary

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