

## Substructure tagging with mass and pt dependent variable-R jet clustering and a soft drop veto

*Wednesday 17 August 2022 10:00 (15 minutes)*

The Heavy Object Tagger with Variable R (HOTVR) is an algorithm for the clustering and identification of boosted, hadronically decaying, heavy particles. The central feature of the HOTVR algorithm is a vetoed jet clustering with variable distance parameter  $R$ , that decreases with increasing transverse momentum of the jet. In this talk, we present improvements to the HOTVR algorithm, replacing the mass jump with a soft drop veto in the clustering. We study the performance of jet substructure tagging with HOTVR and ungroomed variable  $R$  jets, where we use machine learning techniques and energy flow polynomials to analyse the information loss from the soft drop veto. In addition, we show preliminary results of a distance parameter that changes with the jet mass and the transverse momentum, allowing to achieve an optimal value of  $R$  for  $W$ ,  $Z$ ,  $H$  bosons and top quarks simultaneously.

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