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Background estimation techniques in searches for heavy resonances at CMS

Many Beyond Standard Model theories foresee the existence of heavy resonances (>1 TeV) decaying in final states that include a high-energetic, boosted jet and charged leptons or neutrinos. In these very peculiar conditions, Monte Carlo predictions are not reliable enough to reproduce accurately the expected Standard Model background. A data-Monte Carlo hybrid approach (alpha method) has been successfully adopted since Run1 in heavy-Higgs searches performed by CMS collaboration. By taking advantage of data in signal-free control regions, determined exploiting the boosted jet substructure, predictions are extracted in signal region. The alpha method and jet substructure techniques are described in detail, along with some recent results obtained with 2016 data collected by CMS detector.

Experimental Collaboration

CMS

Primary author: BENATO, Lisa (Universita e INFN, Padova (IT))

Presenter: BENATO, Lisa (Universita e INFN, Padova (IT))

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