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Jet Clustering Techniques for New Higgs Boson Searches in Hadronic Final States

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We assess the performance of different jet-clustering algorithms, in the presence of different resolution parameters and reconstruction procedures, in resolving fully hadronic final states emerging from the chain decay of the discovered Higgs boson into pairs of new identical Higgs states, the latter in turn decaying into bottom antibottom quark pairs. We show that, at the LHC, to select a multi-jet final state and to construct the Higgs masses depend strongly on the jet-clustering algorithm as well as its settings and the choice of acceptance cuts. The aim is to indicate the optimal choice of the latter for establishing such a benchmark Beyond the SM (BSM) signal.

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