

Heavy flavour identification at CMS

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Most of the CMS studies rely on the identification of b jets (b tagging), which is important for a broad range of analyses at CMS. Identification algorithms of jets from B hadrons heavily rely on machine learning tools and are thus natural candidates for advanced tools like deep neural networks. During the past couple of years, the CMS Collaboration has proven the power of deep neural networks implementing new algorithms, which outperform previous algorithms for b jet identification. While improving b tagging, the CMS Collaboration is pushing the heavy flavor identification beyond the traditional boundaries, with the implementation of b tagging algorithms specialized to the boosted topologies, and the development of c tagging algorithms, used to identify jets originated from charm quarks. With the increased experimentally excluded mass ranges of new particles, in several cases at the TeV scale, searches need to focus more and more on very boosted regimes. Several heavy flavor identification tools specific for boosted topologies have been developed to make these searches possible, such as b tagging of subjets and a double b tagger, aiming at the identification of boosted decays of the heavy particles into pairs of b quarks. This talk will present all this cutting edge developments, together with their performance measurements on CMS data.

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