



Contribution ID: 137

Type: **Parallel Talk**

## Reconstruction and identification of hadronic objects with CMS

*Thursday, July 6, 2017 4:30 PM (15 minutes)*

Performance & validation of new developments of reconstruction algorithms of several hadronic objects using data collected by the CMS experiment in 2016 at a centre-of-mass energy of 13 TeV are presented.

The jet energy and missing transverse momentum scales are measured in MC and data. A likelihood based discriminator is used to distinguish jets originating from quarks and gluons, and multivariate techniques are employed to distinguish pile up jets. Algorithms are used to identify large radius jets reconstructed from the decay products of highly Lorentz boosted W bosons and top quarks, and the efficiency and background rejection rates of these algorithms are measured.

Recent cutting edge developments of heavy flavor identification algorithms are discussed, which exploit the power of deep neural networks. The expected performance of these algorithms in 2017, when CMS will start to collect data with an upgraded pixel detector, will be also shown. The CMS Collaboration is pushing the heavy flavor identification beyond the traditional identification of b jets. The talk will also discuss the implementation of algorithms specialized to the boosted topologies, and the identification of jets originated from charm quarks.

Tau leptons decaying via hadronic modes are reconstructed and identified using Hadron plus Strips (HPS) algorithm. The electromagnetic strip reconstruction used by this algorithm is improved to better model signal of  $\pi^0$  from tau decays by allowing the strip size to dynamically change based on the strip energy. This improves the energy response and removes the tau footprint from isolation area. In addition to this, improvement to discriminators combining isolation and tau life time variables, and anti-electron in multivariate analysis technique are also developed.

### Experimental Collaboration

CMS

**Primary author:** VERZETTI, Mauro (University of Rochester (US))**Presenter:** VERZETTI, Mauro (University of Rochester (US))**Session Classification:** Detectors and data handling**Track Classification:** Detector R&D and Data Handling