Contribution ID: **106** Type: **Poster + Flashtalk**

B-hadron identification in b-jets using novel deep learning technique in pp collisions in CMS

Understanding the substructure of jets initiated by heavy quarks is essential for quantum chromodynamics (QCD) studies, particularly in the context of the dead-cone effect and jet quenching. The kinematics of b-hadron decays present a challenge for substructure measurements with inclusive b-jets. We propose an approach using geometric deep learning to extract the optimal representation of the b-hadron decays utilizing the charged decay products of the jet represented as a point cloud and identify tracks associated with the b-hadrons while simultaneously tagging the b-jets. The method is demonstrated in simulations of p-p and Pb-Pb collisions at $\sqrt{s} = 5.02$ TeV with the CMS detector and compared with previous approaches based on boosted decision trees.

AI keywords

geometric deep learning; point cloud identification; signal reconstruction

Primary author: SPEAKER, CMS

Presenter: SPEAKER, CMS

Track Classification: Inference & Uncertainty