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## Identification of $b$ jets in boosted event topologies with CMS

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### Summary

As the LHC explores a new energy regime, searches for physics beyond the Standard Model at high mass scale will probe objects produced with a momentum considerably higher than their mass. As a result, the decay products of the boosted parent particle are collimated and clustered into a single ‘fat’ jet after hadronization. “Boosted  $b$  tagging” aims to identify  $b$  quarks arising from boosted particles, such as the decay of highly Lorentz-boosted top quarks via  $t \rightarrow Wb$ , with the  $W$  boson decaying hadronically, or for instance boosted Higgs or  $Z$  bosons decaying to a  $b$  quark pair. Jet substructure techniques can be used to resolve the subjects corresponding to the hadronized partons inside the fat jets. In that case, standard  $b$  tagging algorithms can be applied on the subjects. For the identification of boosted Higgs or  $Z$  bosons decaying to a  $b$  quark pair, a different strategy is envisaged using the novel double- $b$  tagger that aims to identify both  $B$  hadron decays in the fat jet. In this presentation, we present the strategies and tools for identifying  $b$  jets in boosted topologies with the CMS experiment as well as the related performance measurements using the 13 TeV proton collisions.

**Presenter:** FERENCEK, Dinko (Institute Rudjer Boskovic (HR))

**Session Classification:** Plenary