# Optimization of secondary vertex based b-jet tagging algorithm with ALICE at the LHC.

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## Abstract:

Jets are cones of particles produced by the hadronization of colored partons formed in elementary, hadronic and heavy-ion collisions. They are produced in hard QCD scattering processes. Jet reconstruction provides access to the kinematics of partons produced in hard scatterings in the initial stage of heavy-ion collisions and that later suffer energy loss in the medium via gluon radiation and elastic collisions. They can be used to investigate the properties of the hot and dense medium formed in the collisions [1,2,3,4,5]. It is very important to study b-jet production at higher energies available at LHC in pp collisions to provide further tests to perturbative QCD calculations and to serve as reference for more complex systems like p-Pb and Pb-Pb collisions. Measurements of the medium modification factor corresponding to the b-jet production as a function of transverse momentum and centrality of collisions will contribute to the understanding of the properties of matter formed in the collisions.

The ALICE detector [6] has a potential to discriminate jets originating from b-quarks with different tagging algorithms. A variety of algorithms for b-jet tagging was elaborated at the LHC. They rely on the properties of B-hadrons, i.e. their long life time, large mass and large multiplicity of decay products. In this work, the b-tagging algorithm used is based on secondary vertex topologies. We will present Monte Carlo based performance studies of b-jet tagging algorithm for charged jets reconstructed with ALICE in p-Pb collisions at $\sqrt{s_{NN}} = 5.02\,TeV$.

The b-jet tagging efficiency and mis-tagging rates for light flavored jets and charm jets will be discussed.

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