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Prospects for beauty-jet measurements with ALICE

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Heavy quarks, i.e. charm and beauty, are ideal probes of the QCD matter formed in relativistic heavy-ion collisions, as they are predominantly produced in the early stage of the collision via initial hard parton scatterings. While propagating through the dense matter, they lose energy through elastic scatterings and radiative processes. Theoretical models predict that the energy loss of high-energy partons depends on the color charge and parton mass, with the expectation that in the medium beauty quarks lose less energy than charm and light quarks. These dependencies can be explored by comparing the modification in Pb-Pb collisions, relative to pp collisions, of beauty jets with that of charm or light-parton jets.

In this poster we present Monte Carlo based performance studies of different b-jet tagging algorithms in ALICE for pp collisions at $\sqrt{s} = 7$ TeV. The algorithms, which benefit from the long lifetime of B mesons, are based on the identification of secondary decay vertices and displaced single tracks. In addition, the identification of electrons in jets can be used to profit from the large semi-electronic decay branching ratios of B mesons. Their capability to discriminate beauty jets from charm and light-parton jets will be discussed along with the analysis strategy and outlook. The performance after the ALICE upgrade, which foresees a new Inner Tracking System with improved spatial resolution, will also be presented.

On behalf of collaboration:

ALICE

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