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Simulation studies of beauty-jet tagging in p–Pb collisions at the LHC with ALICE

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Heavy quarks (charm and beauty) are predominantly produced via initial hard parton scatterings in the early stages of hadronic collisions. Thus, they are ideal probes of the QCD matter since they lose energy by means of elastic scatterings and radiative processes while propagating through the strongly-interacting medium created in high-energy heavy-ion collisions. According to theoretical models, the parton energy loss is colour charge and parton mass dependent. In particular, it is expected that beauty quarks lose less energy than charm and light quarks. These dependencies can be studied by comparing the nuclear modification factor of beauty jets with that of charm or light-parton jets. The measurement of beauty-jet production in p-Pb collisions is needed to quantify cold nuclear matter effects, a fundamental step for the interpretation of Pb-Pb results.

In this poster we present Monte Carlo based performance studies of beauty-jet tagging via displaced secondary vertex reconstruction, obtained with ALICE for p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV. The tagging technique, its performance in terms of efficiency and beauty jet selection purity, and the corrections required for measuring the cross section of beauty-jet production will be described. Finally, prospects for measurements in LHC Run 2, will also be presented.

On behalf of collaboration:

ALICE

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