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Study of jet mass in p+p and Pb+Pb collisions at $\sqrt{s_{\mathrm{NN}}}$ = 2.76 TeV within a multiphase transport model

Jet mass is expected to be sensitive to jet quenching in the hot QCD matter created in relativistic heavy-ion collisions. The recent ALICE measurement of the jet mass in central Pb+Pb collisions is consistent within uncertainties with p–Pb reference measurements [1].

The jet mass distribution is investigated in p+p and Pb+Pb collisions at $\sqrt{s_{\mathrm{NN}}}$ = 2.76 TeV using a multiphase transport model with string melting mechanism [2,3]. It is found that the mean charged jet mass increases gradually with the jet transverse momentum, but no obvious difference is observed between the final states of central Pb+Pb collisions and p+p collisions. In central Pb+Pb collisions, jet mass distribution is shifted by parton cascade by jet quenching effect, relative to the initial state. However, the shifting is strongly diminished by hadronization and hadronic rescatterings. Hence, no significant difference persists in final sate jet mass distribution. In addition, the separation between gluon and quark jet mass distributions is observed, which is mainly caused by different numbers of jet constituents in the initial state, instead of jet quenching effect [4].

References:

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