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Studies of dijet and photon-jet properties in pp, pPb and PbPb collisions with CMS

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Studies of dijet and photon-jet properties in pPb collisions are of great importance to establish a QCD baseline for hadronic interactions with cold nuclear matter. Dijet and photon-jet production have been measured in pPb collisions at a nucleon-nucleon center-of-mass energy of 5.02 TeV. The transverse momentum balance and azimuthal angle correlations are studied in both dijet and photon-jet channels, leading to the observation that there is no significant modification, which allows these systems to be used as tools to probe the nuclear modifications of the parton distribution functions (PDFs). In the dijet system, pseudorapidity distributions are studied as a function of the transverse energy in the forward calorimeters (E_T^{HF}). The mean value of the dijet pseudorapidity is found to change monotonically with increasing E_T^{HF} , indicating a correlation between the energy emitted at large pseudorapidity and the longitudinal motion of the dijet frame. The pseudorapidity distribution of the dijet system is compared with next-to-leading-order perturbative QCD predictions obtained from both nucleon and nuclear PDFs, and the data more closely match the latter.

In addition to the studies of initial state, the photon-jet measurements related to quenching in PbPb are updated to have a more precise pp reference based on the 2013 LHC run at 2.76 TeV.

On behalf of collaboration:

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