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gamma-hadron spectra in p+Pb collisions at 5.02 TeV and in O+O collisions at 7 TeV

Under the assumption that a quark-gluon plasma droplet is produced in p+A collisions, γ-triggered hadron spectra are studied within a next-to-leading-order perturbative QCD parton model with the medium-modified parton fragmentation functions in p+Pb collisions at $\sqrt{s_{\rm NN}} = 5.02$ TeV.
The initial conditions and space-time evolution of the small system of hot and dense medium is simulated by superSONIC hydrodynamic model and parton energy loss in such a medium is described by the high-twist (HT) approach.
The scaled jet transport coefficient $\hat{q}/T^3$ in this HT approach is extracted from single hadron suppression in central A+A collisions with similar initial medium temperature as in p+A collisions.
Numerical results for this scenario show that γ-hadron spectra at $p_{\rm T}^{\gamma} = 12 - 40$ GeV/c are suppressed by 5-15% in the most central 0-10% p+Pb collisions at $\sqrt{s_{\rm NN}} = 5.02$ TeV.
The suppression becomes weaker at higher transverse momentum of the γ trigger. As a comparison, γ-hadron suppression in Pb+Pb collisions at $\sqrt{s_{\rm NN}} = 2.76$ and 5.02 TeV is also predicted.
Furthermore, as a bridge between large system of heavy A+A collisions and small system of p+A collisions, γ-hadron suppression in light nucleus O+O collisions at $\sqrt{s_{\rm NN}} = 7$ TeV is also studied.

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