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Gamma-hadron spectra in $p + \text{Pb}$ collisions at $\sqrt{s_{\text{NN}}} = 5.02 \text{ TeV}$

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Under the assumption that a quark-gluon plasma droplet is produced in $p + A$ collisions, γ -triggered hadron spectra [1,2] are studied within a next-to-leading-order perturbative QCD parton model with the medium-modified parton fragmentation functions in $p + \text{Pb}$ collisions at $\sqrt{s_{\text{NN}}} = 5.02 \text{ TeV}$. The initial conditions and space-time evolution of the small system of hot and dense medium is simulated by superSONIC hydrodynamic model [3] and parton energy loss in such a medium is described by the high-twist (HT) approach [4]. The scaled jet transport coefficient \hat{q}/T^3 in this HT approach is extracted from single hadron in central $A + A$ collisions because its values from single and dihadron suppressions are similar [5]. Numerical results show that γ -hadron spectra for $p_T^\gamma = 12 - 40 \text{ GeV}/c$ in this scenario are suppressed by 10% \sim 20% in the most central 0 - 10% $p + \text{Pb}$ collisions at $\sqrt{s_{\text{NN}}} = 5.02 \text{ TeV}$. The suppression becomes weaker with higher transverse momentum of the triggered- γ . As a comparison, γ -hadron suppression in $\text{Pb} + \text{Pb}$ collisions at $\sqrt{s_{\text{NN}}} = 2.76$ and 5.02 TeV is also predicted.

References

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Collaboration (if applicable)

Track

Jets and High Momentum Hadrons

Contribution type

Contributed Talk

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