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Study of nuclear modification factors of (anti-)hadrons and light (anti-)nuclei in Pb-Pb collisions at √sNN = 2.76 TeV

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The nuclear modification factors (R_{AA}) of $\pi^{\pm}, p(\bar{p})$, and $d(\bar{d})$ with $|y| < 0.5, p < 6.0$ GeV/c in peripheral (40-60%) and central (0-10%) lead-lead collisions at $\sqrt{s_{NN}}$ =2.76 TeV have been studied using the parton and hadron cascade (PACIAE) model plus the dynamically constrained phase-space coalescence (DCPC) model. It is found that the distribution of R_{AA} of light (anti-)nuclei d is similar to that of hadrons (π, p), and the distribution of anti-particles is the same as that of particles.
The suppression of high transverse momentum particles strongly depends on event centrality and mass of the particles, $i.e$, the central collision is more suppressed than the peripheral collision.
Besides, the yield ratios, double ratios R^D_{AA} of ($\bar{d}$ to $\bar{p}$, $\bar{p}$ to π^-, d to p, p to π^+),
and the coalescence parameter B_2 for $(d, \bar{d})$ in pp, central and peripheral $Pb-Pb$ collisions are discussed, respectively.
It is observed that the yield ratios and R^D_{AA} of $\bar{d}$ to $\bar{p}$ and $\bar{p}$ to π^-
are also the same with the corresponding values of d to p and p to π^+
in three different collision systems, respectively, suggesting that the suppressions
of matter (π^+, p, d) and the corresponding
antimatter ($\pi^-, \bar{p}, \bar{d}$) has the same character and performance. Our results are comparable to those of experimental data at $p_T < 3.0$ GeV/c.

Abstract Type

Poster

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