

# Study of nuclear modification factors of (anti-)hadrons and light (anti-)nuclei in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ 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 ( $\pi$ ,  $p$ ), 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  $R_{AA}^D$  of  $(\bar{d}$  to  $\bar{p}$ ,  $\bar{p}$  to  $\pi^-$ ,  $d$  to  $p$ ,  $p$  to  $\pi^+$ ), 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  $R_{AA}^D$  of  $\bar{d}$  to  $\bar{p}$  and  $\bar{p}$  to  $\pi^-$  are also the same with the corresponding values of  $d$  to  $p$  and  $p$  to  $\pi^+$  in three different collision systems, respectively, suggesting that the suppressions of matter ( $\pi^+$ ,  $p$ ,  $d$ ) 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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