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Nuclear modification factors of strange and multi-strange particles in pPb collisions with the CMS experiment

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Identified particle spectra provide an important tool for understanding the particle production mechanism and the dynamical evolution of the medium created in relativistic heavy ion collisions. Studies involving strange and multi-strange hadrons, such as K_S^0 , Λ , Ξ^- , and Ω^- , carry additional information since there is no net strangeness content in the initial colliding system. Strangeness enhancement in AA collisions with respect to pp and pA collisions has long been considered as one of the signatures for quark-gluon plasma (QGP) formation. The recent observation of collective effects in high-multiplicity pp and pA collisions raise the question of whether QGP can also be formed in the smaller systems. Systematic studies of the strange particle abundance and nuclear modification factors can shed light on this issue. The CMS experiment has excellent strange-particle reconstruction capabilities over a broad kinematic range in pp and pPb collisions. The spectra of K_S^0 , Λ , Ξ^- , and Ω^- hadrons have been measured in various rapidity regions as a function of p_T in pp and pPb collisions at 5.02 TeV. Based on the measurements of these spectra, nuclear modification factors of K_S^0 , Λ , Ξ^- , and Ω^- in mid-rapidity are measured. Since pPb is an asymmetric system, the nuclear modification factor of K_S^0 , Λ , and Ξ^- in Pb-going direction are compared to those in p-going direction. These final results for nuclear modification factors measured out to high- p_T can be helpful in discussing the implications of collective behavior and energy loss. In addition, the measurement of the forward-backward rapidity yield asymmetries of K_S^0 and Λ as a function of p_T provide sensitivity to initial state effects, such as shadowing in the nuclear parton distributions. Detailed comparisons with theoretical models will be presented.

Content type

Experiment

Collaboration

CMS

Centralised submission by Collaboration

Presenter name will be specified later

Presenter: VELKOVSKA, Julia (Vanderbilt University (US))

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