

Towards a common particle-emitting source in small systems for mesons and baryons with ALICE

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The ALICE Collaboration recently published a plethora of results obtained from femtoscopic measurements, studying the interaction between many exotic combinations of particles, most notably p - Ω . In general these studies depend on a precise understanding of the particle-emitting source, which is constructed employing the resonance source model (RSM). In the RSM, deviations from a Gaussian source caused by the short-lived resonances are modeled via a Monte Carlo (MC) procedure. The MC procedure is employed to access the convolution of the Gaussian source with the exponential decay functions of the resonances, while taking into account the decay kinematics. For two-particle correlations between baryons (p - p and p - Λ) the RSM was already validated with great success. The goal of this work is to ascertain whether the RSM can also be applied to constrain the source in the mesonic sector, for example in the case of same charge π - π (or K^+ - p), for which by far the largest contribution from resonances is expected. A differential study of the spatial extension of the source function as a function of transverse mass (m_T) and multiplicity is presented. The results are based on minimum-bias and high-multiplicity pp collisions at $\sqrt{s} = 13$ TeV recorded with the ALICE detector. An m_T scaling behaviour of the source is observed and found to be compatible with previous results in the baryonic sector. This measurement gives confidence for a common source for mesons and baryons in small systems, allowing to employ the RSM to constrain the source for meson-baryon and meson-meson.

Collaboration

ALICE

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