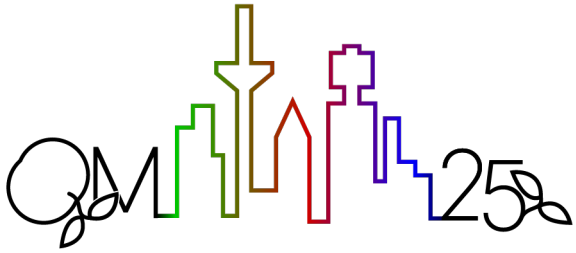

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Studying chiral partner resonances K^* and K_1 to investigate chiral symmetry restoration with ALICE

In relativistic heavy-ion collisions at the LHC, the quark-gluon plasma (QGP) is produced. The transition is achieved when the system reaches a specific critical temperature (T_{ch}). Lattice QCD calculations indicate that chiral symmetry (CS) restoration occurs around T_{ch} as well (~ 156 MeV). CS restoration can be investigated using resonances that are parity partners, i.e. particles that have the same quantum numbers except for parity, such as $\mathrm{K}^*(892)^0$ and $\mathrm{K}_1(1270)$. These resonances exhibit different masses, widths, and production yields in the vacuum. However, these discrepancies are expected to diminish at a temperature near those associated with CS restoration, resulting in a K_1 to K^* production ratio higher than the one predicted by the statistical hadronization model.
The ALICE experiment has excellent tracking and particle identification capabilities across a wide momentum range. Along with the large data sample collected in Run 3, the ALICE apparatus is perfectly suited for measuring hadronic resonances, including those with high mass and width. In this contribution, results on the $\mathrm{K}^*(892)^0$ resonance production using LHC Run 3 data for Pb-Pb collisions at $\sqrt{s_{NN}} = 5.36$ TeV will be presented and compared to state-of-the-art models. Furthermore, the preliminary study of the K_1 measurement with ALICE and plans for investigating CS restoration will be discussed.

Category

Experiment

Collaboration (if applicable)

ALICE

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