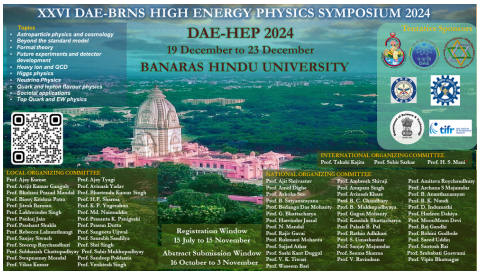

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Search for higher mass exotic resonances through KK decay channel at $\sqrt{s} = 13.6$ TeV with ALICE

The Standard Model (SM) of particle physics is the most successful theory in describing fundamental particles and their interactions. It characterizes ordinary hadronic matter as consisting of quark-antiquark pairs or three-quark combinations, forming mesons and baryons. Beyond this, the SM also allows the existence of exotic hadrons composed of more than three quarks or a bound state of gluons. One notable example is the glueball, which is made entirely of gluons arising from gluon self-interactions. Lattice QCD calculation predicts the mass of the lightest scalar glueball to be in the range of 1500–1700 MeV/c^2 having quantum numbers, $J^{PC} = 0^{++}$. However, the experimental search for glueballs is challenging due to their mixing with nearby mesonic states sharing identical quantum numbers. The large statistics data collected by the ALICE detector during Run 3 at the highest centre-of-mass energy offers a unique opportunity to explore the glueball hypothesis, study its properties and internal structure, and probe the standard model predictions. This report will present the invariant mass distributions of higher-mass resonances in the range 1000–3000 MeV/c^2. The analysis is performed through the decay channels $K^0_S K^0_S$ and K^+K^- in pp collisions at $\sqrt{s}$ = 13.6 TeV using ALICE detector at midrapidity.

Field of contribution

Experiment

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