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Recent Results on Pentaquark Searches from STAR
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We have examined the \( p + K^+ \) and \( p + K^- \) invariant mass distribution and observe a peak structure with approximately 4-5 sigma statistical significance in \( d + Au \) collisions at \( \sqrt{s_{NN}} \) 200 GeV and \( Au + Au \) collisions at 62.4 GeV. The apparent mass of the observed peak is at 1530 MeV/c\(^2\). Its width is consistent with detector resolution. The nature of the peak is under active investigation. If confirmed as a particle, this state would be manifestly exotic with \( uuud\bar{s} \) quark structure. The observed yield is estimated to be very small. No signal above combinatoric background was observed in STAR \( p + p \) and \( Au + Au \) collisions at 200 GeV from RUN II. New analysis results from larger data samples of Run IV \( Au + Au \) 200 GeV and Run V \( Cu + Cu \) 62.4 GeV will be reported and the status of such pentaquark searches in general will be discussed.

¹For the STAR Collaboration