

Probing Baryon Resonances via $\pi p \rightarrow \pi\pi N$ and KY Reactions at J-PARC

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Content

The J-PARC E45 experiment is proposed to explore the excitation spectrum of N^* and Δ^* resonances by measuring $\pi p \rightarrow \pi\pi N$ and $\pi p \rightarrow KY$ reactions using the HypTPC with a liquid hydrogen target [1]. By employing both π^+ and π^- beams in the 1.52–2.15 GeV center-of-mass (CM) energy range, the experiment enables isospin decomposition and provides access to resonances that couple strongly to multi-pion or strange final states. High-statistics and high-precision data will contribute to the identification of poorly established or exotic resonances, including candidates for hidden-strangeness pentaquarks, and will serve as crucial input for partial-wave analyses in collaboration with global efforts. A Phase-1 run is planned for early next year at the J-PARC K1.8BR beamline, focusing on the lower CM energy region below 1.76 GeV. In this talk, I will discuss interesting resonances expected in this low-energy region and present an overview and current preparation status of the E45 experiment.

Reference

[1] H. Sako et al., Proposal to J-PARC, 3body hadronic reactions for new aspects of baryon spectroscopy, https://j-parc.jp/researcher/Hadron/en/pac1207/pdf/P45_2012-3.pdf.

Field of Research: Strangeness in hadron structure

Experiment / Theory: Experiment

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