

Current performance and future upgrades of Hyperon Spectrometer for exotic hadron search experiments at J-PARC

Thursday 30 June 2022 15:00 (15 minutes)

A large-acceptance superconducting spectrometer for a series of hadron experiments, Hyperon Spectrometer, has been developed at J-PARC. The first experiment, E42, was performed using the Hyperon Spectrometer in 2021 to search for an exotic 6-quark state, the H-dibaryon. The E42 detector is sensitive to search for the H-dibaryon over a broad mass range, measuring $\Lambda p\pi^-$, $\Lambda\Lambda$, and $\Xi^- p$ systems in the $^{12}\text{C}(K^-, K^+)$ reaction at $p_{K^-} = 1.8 \text{ GeV}/c$. In addition, we are preparing the following experiment to search for a new resonance, $\Lambda(1665)$, suggested by earlier experiments. The $\Lambda(1665)$ could be a completely new exotic state that the quark model can not explain. We will determine the spin-parity of this new resonance with the Hyperon Spectrometer. This presentation will report an overview of these exotic hadron search experiments and the current performance and future upgrades of the Hyperon Spectrometer.

Author: HAYAKAWA, Shuhei (Tohoku University)

Presenter: HAYAKAWA, Shuhei (Tohoku University)

Session Classification: 4; Thu-IIIa