

High resolution spectroscopy of the " ΣN cusp" at J-PARC (J-PARC P90)

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Recently, we have proposed a new experiment (J-PARC P90 experiment) to measure the missing-mass spectrum around the ΣN threshold in the $d(K^-, \pi^-)$ reaction at 1.4 GeV/c. A clear enhancement was observed near the ΣN threshold, so called " ΣN cusp", for a long time ago. However, the dynamical origin of this enhancement remains unclear as yet. Especially, whether " ΣN cusp" is cusp or unstable bound state has not been determined yet. One of the key to make it clear is to improve the missing-mass resolution and statistics. In this experiment, we can achieve the missing-mass resolution of 0.4 MeV in σ by using K1.8 beam line and S-2S spectrometers at J-PARC. Moreover, we will additionally install the time projection chamber (HypTPC), which was developed for the other J-PARC experiment (E42: H-dibaryon search), to suppress quasi-free backgrounds by detecting the charged tracks of the decay products. We can deduce the scattering length of ΣN system with isospin $T = 1/2$ and spin triplet channel in this experiment. In this presentation, we will show the detailed information of this new experiment.

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