

## Results of the J-PARC E27 experiment

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Recently, a study of kaonic nuclei have been actively conducted because they have a rich information, such as the sub-threshold  $K\bar{K}N$  interaction and the behavior of  $\Lambda(1405)$  in many body systems. While the existence of kaonic nuclei has been intensively studied both theoretically and experimentally, there is no conclusive result establishing its existence. Here, we have carried out a experiment as a first phase to search for a  $K^-pp$  bound state, which is considered the simplest kaonic nucleus, by using the  $d(\pi^+, K^+)X$  reaction at 1.69 GeV/c (J-PARC E27 experiment). Since the production cross section of the  $K^-pp$  would not be so large in this reaction, coincidence of high-momentum ( $> 250\text{MeV}/c$ ) proton(s) in large emission angle ( $39^\circ$ - $122^\circ$ ) was required to enhance the signal to background ratio. We have obtained an inclusive  $d(\pi^+, K^+)X$  spectrum in a wide missing-mass range from  $\Lambda$ ,  $\Sigma$  to  $\Lambda(1405)/\Sigma(1385)$ , in high statics and high energy resolution for the first time. A broad enhancement in the proton coincidence spectra are observed around the missing-mass of  $2.27\text{ GeV}/c^2$ , which might be attributed to the  $K^-pp$  production. We will report the results both on inclusive and coincidence analyses.

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