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Observation of a K^-pp-like structure in the $d(\pi^+, K^+)$ reaction at 1.69 GeV/c YUDAI ICHIKAWA, Kyoto University / JAEA, J-PARC E27 COLLABORATION — 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 searched for the K^-pp, a bound state of a K^- with two protons, in the $d(\pi^+, K^+)$ reaction at 1.69 GeV/c at J-PARC K1.8 beam line with a missing-mass resolution of 2.7 MeV/c^2(FWHM). In this reaction, the K^-pp is assumed to be produced as $\Lambda(1405)$ as a doorway such as $\pi^+ n \to K^+\Lambda^*$, $\Lambda^* p \to K^-pp$. Since the sticking probability of the Λ^* on proton would not be so large, coincidence of high-momentum ($>$ 250 MeV/c) proton(s) in large emission angles ($39^\circ < \theta_{lab.} < 122^\circ$) was requested to enhance the signal-to-background ratio. We have obtained an inclusive (π^+, K^+) spectrum in a wide missing-mass range from Λ, Σ to $\Lambda(1405)/\Sigma(1385)$, for the first time. A proton coincidence spectrum shows a large proton-emission probability at around 2.27 GeV/c^2 as a broad bump. It might be attributed to the K^-pp production. A study of decay branch suggests non-mesonic decays of ΛN and ΣN are dominant rather than mesonic decays. We will report the results both on inclusive and coincidence analyses.

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