

# The search for deeply bound kaonic nuclear states at J-PARC

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In recent decades, considerable efforts have been devoted to studies of antikaon-nucleon interactions both experimentally and theoretically. Presently it is thought that antikaons are very likely to form bound states with a few nucleons. However, the predictions range from deep states with a narrow width to shallow states with a large width [1]. Also, several experimental searches for kaonic nuclear states have been performed so far, but the results are not conclusive [2]. In conclusion, there is strong need of a dedicated experiment to the study of this scientific case.

The J-PARC E15 experiment aims to search for the lightest kaonic nuclear states, namely  $K^-pp$  bound states, using in-flight ( $K^-$ ,  $n$ ) reactions on  $^3\text{He}$  at the J-PARC K1.8BR beam-line [3]. The advantage of this experiment is to measure the missing mass in the ( $K^-$ ,  $n$ ) reactions and the invariant mass of the decay such as  $K^-pp \rightarrow \Lambda p \rightarrow p\pi^-p$ , simultaneously. Presently, the detector construction is almost finished. The commissioning of the Cylindrical Detector System, which is designed for the invariant mass study, already started.

In this contribution, the experimental features and the current status will be presented.

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