Study of the $\bar{K}$-nucleus interaction by using the ^{12}C(K^-, p) reaction at J-PARC

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We have measured the inclusive missing-mass spectrum of the ^{12}C(K^-, p) reaction at a K^- beam momentum of 1.8 GeV/c. This experiment was carried out as a by-product of a pilot run of the J-PARC E05 experiment, which was conceived to search Ξ-hypernuclei by using the (K^-, K^+) reaction at J-PARC K1.8 beam line. In present measurement, we study the $\bar{K}$-nucleus interaction by comparing the observed missing- mass spectrum with a DWIA calculation. In a preliminary analysis, a "KINK" structure, which might be originated from the threshold of $K^-N \to \Sigma\pi$ absorption, was found.

KEYWORDS: $\bar{K}N$ interaction, Kaonic nuclei, $\Lambda(1405)$

1. Introduction

The interaction between $\bar{K}$ and nucleus has been studied by measuring the X-rays from kaonic atoms, which were coulombian bound state of a K^- and a nucleus under the influence of the strong interaction, for a long time. However, it is difficult to determine a $\bar{K}$-nucleus potential only from the information of these X-rays. It is because the depth of $\bar{K}$-nucleus potential strongly depends on the theoretical model setting. From the result of $t\rho$ approach, which is widely used to investigate the hadron-nucleus interaction, the best fit potential gives a real part depth of about -80 MeV for a typ-