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Double-Strangeness Production in (K^-, K^+) Reaction

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We measured double-strangeness systems produced in the $^{12}C(K^-, K^+)X$ reaction which involves a Ξ^- hyperon and a $\Lambda\Lambda$ hyperon pair at the J-PARC using 1.8 GeV/c K^- beam.
The E42 experiment which has a primary goal to search for the H-dibaryon collected 300K $^{12}C(K^-, K^+)X$ reaction events containing thousands of $\Lambda\Lambda$ events which is two orders of magnitude larger then ever.
In the high-momentum region of outgoing K^+ particles, low-momentum Ξ^- hyperons are produced in the (K^-, K^+) reaction. Such a slow Ξ^- hyperon may have high probability to stick up to the nucleus. It will be ended up with ΞN elastic scattering, $\Xi^- p \to \Xi^0 n$ charge exchange reaction, or $\Xi^- p \to \Lambda\Lambda$ conversion process, unless the Ξ^- escapes from the nucleus.
The cross-section measurement of $^{12}C(K^-, K^+\Xi^-)$ and $^{12}C(K^-, K^+\Lambda\Lambda)$ reactions will provide crucial information on the $\Xi^- - N$ potential strengths and the cross-section ratio of individual processes. This talk will report the first cross-section measurement results for $^{12}C(K^-, K^+\Xi^-)$ and $^{12}C(K^-, K^+\Lambda\Lambda)$ reactions at 1.8 GeV/c.

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