Abstract Submitted
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Development of a water Cherenkov counter for the spectroscopy
of Ξ hypernucleus KOHEI TAKENAKA, Kyoto University, J-PARC E05 COL-
LABORATION — We plan to obtain the spectroscopic information of Ξ hypernu-
cleus through the $^{12}\text{C}(K^-, K^+)$ reaction by using the high intensity $K^-$ beam at
J-PARC. When $K^-$ hit the target, not only $K^+$ but also protons are scattered.
The rate of protons is estimated three orders of magnitude higher than that of $K^+$. 
These protons are trigger backgrounds and make DAQ efficiency worse. Thus pro-
tons have to be suppressed by at least 10% in the trigger level. In order to fulfill
this requirement, we use a water ($n = 1.33$) Cherenkov counter. The momentum
region of $K^+$ and protons is around 1.3 GeV/$c$, both of which generate Cherenkov
light. However, because high-velocity $K^+$ generate 2.5 times as many photons as
protons, $K^+$ and protons can be discriminated by the number of photoelectrons.
We estimated that at least 50 photoelectrons are required for $K^+$ at 1.3 GeV/$c$ in
order to reject 90% protons. We made and have developed a prototype of a water
Cherenkov counter. We examined how proton rejection efficiency depends on reflec-
tive sheets and radiator by using cosmic ray. In addition, we investigated incident
beam position and angle dependence of proton rejection efficiency at ELPH. I will
report results of these experiments.

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