Track following of Ξ- hyperons
in nuclear emulsion for the E07 experiment

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Events of Twin Single-Λ Hypernuclei and Double-Λ Hypernucleus are very important to understand Λ-Λ and Ξ-N interaction. Regarding the Λ-Λ interaction, we found it weak attractive from the Nagara event($^6_{ΛΛ}$He) in the E373 experiment. [1]

We planned the E07 experiment to find Nuclear mass dependences of Λ-Λ and Ξ-N interaction with ten times higher statistics than that of E373. In the experiment, the number of Ξ- hyperon stopping at rest is about ten thousands ($\sim 10^4$) which is ten times larger than that of E373. Such number of tracks for Ξ- hyperon candidate should be followed in nuclear emulsion plate up to their stopping point as shown in Fig. 1. To complete its job within one year, it is necessary for development of automated track following system. [2]
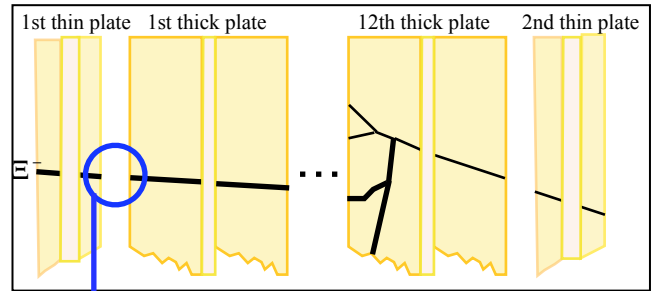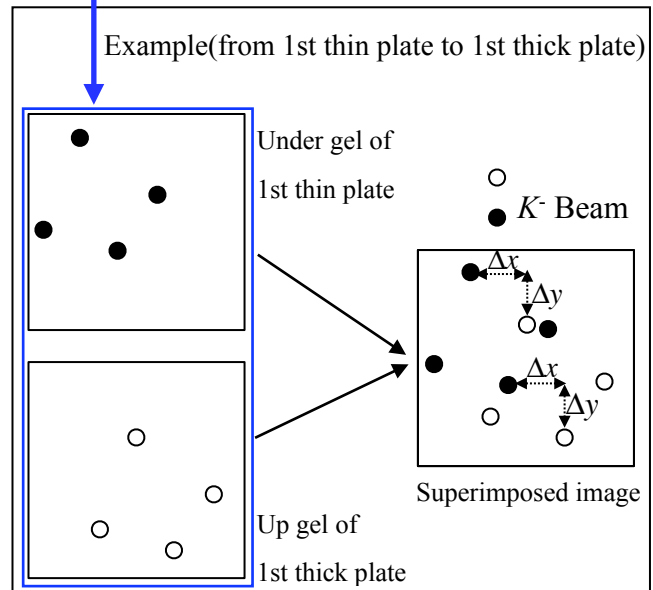

Figure.1 stack of emulsion

Figure.2 pattern match of *K*- beams

One of important points is track connection in plate by plate. To carry out its connection smoothly, we apply pattern match of *K*- beams with image processing method, as shown in Fig. 2. If we succeed this application in one minute for a track in each plate, all track following can be finished in one year.

In this paper, we will report the detail status of the development for Ξ- following system.

Reference

[1] J.K.Ahn et al. , Phys.Rev.C **88** , 014003 (2013)

[2] K.Umehara , master thesis , Gifu university(2014) , unpublished