

Abstract Submitted
for the HAW14 Meeting of
The American Physical Society

Improvement in the speed of alpha-decay track measurement

HIDETAKA KOBAYASHI, KAZUMA NAKAZAWA, JYUNYA YOSHIDA, AKIHIRO MISHINA, SHINJI KINBARA, YOKO ENDO, HIROKI ITOH, MYINT KYAW SOE, KINT TANTINT, Gifu University, E07 COLLABORATION — For analysis of double- Λ hypernucleus in nuclear emulsion, it is necessary to know shrinkage factor and density of emulsion plate by measuring the track ranges of alpha particles. The kinetic energies of nuclear fragment from double- Λ hypernucleus are measured by their ranges in the emulsion, which is dedicated photographic emulsion for nuclear physics. Then we have to reconstruct their original ranges since the emulsion plate shrinks about half in thickness after development. Besides, we have to calibrate range-energy relation because the density depends on the emulsion content of moisture. Therefore we use alpha-rays with monochromatic energy as calibration sources which were emitted from natural Radioisotope such as Thorium series and Uranium series in the emulsion. Technique which performs alpha-tracks measurement by image processing is being studied. In the E07 experiment at J-PARC, quick analysis is required for about alpha tracks on about 100 double- Λ hypernuclear events within a few years. At present, we are developing automated range measurement technique instead of traditional manual measurement. Alpha tracks are seen as black, bold lines in micrographs. Image processing program detects such lines and the positions, angles, ranges of them in micrographs.

Hidetaka Kobayashi
Gifu University

Date submitted: 23 Jun 2014

Electronic form version 1.4