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An experimental system of wide-range two dimensional Rutherford backscattering analysis in vacuum chamber

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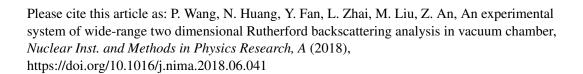
PII: S0168-9002(18)30762-9

DOI: https://doi.org/10.1016/j.nima.2018.06.041

Reference: NIMA 60902

To appear in: Nuclear Inst. and Methods in Physics Research, A

Received date: 24 May 2018 Revised date: 9 June 2018 Accepted date: 12 June 2018



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ACCEPTED MANUSCRIPT

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15 Abstract

Rutherford backscattering spectrometry (RBS) analysis is a widely used ion beam analysis technique to obtain the concentration and/or thickness of the target. In some cases we have to utilize the large area target, for example, about 40 mm diameter target in our $^{12}C(\alpha,\gamma)^{16}O$ experiment of Jinping Underground laboratory for Nuclear Astrophysics (JUNA) project, it means that we should perform wide-range two dimensional (2D) RBS analyses for tens of points in the large area target to obtain the elemental area (or 2D) depth profile distribution which is needed in the $^{12}C(\alpha,\gamma)^{16}O$ experiment. In order to perform the large area target RBS analysis in vacuum chamber accurately and efficiently, an experimental system was developed in this work, which included 1) a 2D moving sample stage in vacuum chamber for precisely positioning points to be analyzed in target, 2) synchronously starting spectrum acquisition

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