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

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1 An experimental system of wide-range two dimensional Rutherford  
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### Abstract

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

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