Abstract Submitted
for the HAW14 Meeting of
The American Physical Society

Simulation of two neutron detection for invariant mass spectroscopy of unstable nuclei JYUNICHI TSUBOTA, Tokyo Institute of Technology, SAMURAICOMMISSIONING COLLABORATION — Two neutron detection in invariant mass spectroscopy is essential to study neutron rich nuclei near and beyond neutron drip line. Recently, Coulomb breakup measurements of ^{19}B and ^{22}C, and study of the unbound nucleus ^{26}O were performed at RIBF. Goal of the Coulomb breakup measurements is to study di-neutron like correlation, while ^{26}O is interesting as a candidate of two neutron radioactivity. In these measurements, decay products, ^{24}O and two neutrons from ^{26}O, for example, are detected in coincidence by SAMURAI spectrometer. The neutrons are detected by large acceptance plastic scintillator array NEBULA. If a neutron scatters twice or more, this may cause a fake signal (crosstalk), and become a background. The crosstalk background can be eliminated by causality cut using time, position, pulse height information. The cut condition is investigated by a Monte-Carlo simulation based on the Geant4 tool kit to obtain high detection efficiency with small crosstalk background. The simulation is compared with experimental data of quasi-monoenergetic neutrons at 200 MeV and 250 MeV produced in the ^{7}Li(p,n)^{7}Be(g.s.+0.43 MeV) reaction. A new algorithm of crosstalk cut will also be discussed.

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Date submitted: 26 Jun 2014 Electronic form version 1.4