

Study of unbound nuclei ^{33}Ne via one-proton knockout reactions

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The magicity of $N=20$ in the vicinity of Ne, Na, and Mg isotopes vanishes due to pf -shell intruder configuration, which is called 'island of inversion' [1-3]. In recent years, shell evolution of Ne isotopes in this region is emerging topic of interest [4,5]. Nevertheless, there is no observed state of ^{33}Ne .

It is only known that ^{33}Ne is unbound nuclei [6] and the $1n$ separation energy S_n is only predicted to -0.9 MeV [7].

The experiment was carried out at the RIBF in RIKEN. The secondary beam of ^{34}Na at 264 MeV/nucleon was provided by BigRIPS [8] and impinged on the carbon reaction target. After the one-proton knockout reaction of ^{34}Na , ^{33}Ne was produced and immediately decayed into ^{32}Ne and a neutron. The invariant mass spectrum of $^{32}\text{Ne} + n$ system was reconstructed by measurement of fragments and neutrons using SAMURAI spectrometer [9]. In this presentation, details of analysis and preliminary results of $^{32}\text{Ne} + n$ invariant mass spectrum will be discussed.

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