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Study of 19C using single-neutron knockout

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The evolution of shell structure toward the driplines is a subject of importance in nuclear physics. For a half decade the p-sd-shell nuclei have been a useful tool for expanding our understanding of shell evolution. 19C is one of those nuclei, well known as the s-wave halo ground state. While the low-lying excited states with 3/2+ and 5/2+ were identified by experimental studies, there exists an argument of bound nature of 5/2+1. From a theoretical point of view, shell model calculations with different interactions show discrepancy in location and ordering of levels.

We investigated the neutron-unbound states of 19C using the one-neutron knockout reaction with SAMURAI spectrometer at RIBF, RIKEN. The 20C beam impinged on a carbon target to produce 19C. The decay products, 18C and a neutron, were detected using SAMURAI and NEBULA neutron array.

In this talk, the observation of populated states and the discussion in the context of shell-model calculations will be reported.

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