

Study of unbound excited states in ^{17}C

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A study of unbound excited states in ^{17}C through one-neutron knockout of ^{18}C at the energy of 245 MeV/nucleon on a carbon target was performed using the SAMURAI spectrometer. Relative energy spectrum of unbound ^{17}C was reconstructed from momentum vectors of ^{16}C fragments and neutrons. The relative energy spectrum was characterized by six resonances at $E_{\text{rel}} = 0.54, 0.81, 1.41, 1.92, 2.30,$ and 3.22 MeV. Three of them at $E_{\text{rel}} = 0.54, 1.41,$ and 2.30 MeV were identified to be in coincidence with $^{16}\text{C}(2_1^+)$, while others have no coincidence with that.

Orbital angular momenta of two resonances at $E_{\text{rel}} = 1.92$ and 3.22 MeV were determined as 1 by momentum distributions. The resonance at $E_{\text{rel}} = 0.81$ MeV, assigned as $5/2_2^+$, was newly observed in the present work. With regard to the resonances having the coincidence with $^{16}\text{C}(2_1^+)$, decay properties of candidate states were examined by branching ratio and shell-model calculations, and spin-parities of them were tentatively assigned. From the present study, it turned out that the YSOX shell-model interaction, involving tensor force for p - sd cross-shell part, provides a good account of the observation. In the presentation, the results and detailed interpretation will be shown.

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