

SEARCH FOR STATES WITH ENHANCED RADII IN TRIPLET ^{12}B - ^{12}C - ^{12}N

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Two independent methods: ANC (Asymptotic normalization coefficients) [1,2] and MDM (Modified diffraction model) [3,4] were applied to new and existing experimental data. The purpose of this analysis is search for states with enhanced radii in isobar-analog excited states of triplet $A=12$: ^{12}B - ^{12}C - ^{12}N .

There is experimental work [1] where halo was observed for 2 states of ^{12}B : 2^- , 1.67 MeV and 1^- , 2.62 MeV. To check this result new experimental data $^{11}\text{B}(d,p)^{12}\text{B}$ was obtained at $E_d = 21.5$ MeV [5,6]. On base of ANC analysis of this new data [5,6], neutron halo existence was confirmed for the 2^- , 1.67 MeV and 1^- , 2.62 MeV states in ^{12}B . An unexpected result was obtained for the unbound 3^- , 3.39 MeV state, which is 19 keV above the neutron emission threshold. Its halo radius was also found to be increased and equal to ~ 6.5 fm [5,6]. This result can be considered as an evidence of the halo-like structure in this ^{12}B state.

What can we expect in isobar-analog states in ^{12}C and ^{12}N ? Are these states also characterized by enhanced radii? To check this prediction, preliminary analysis of existing $^{12}\text{C}(^3\text{He},t)^{12}\text{N}$ and $^{12}\text{C}(^3\text{He},^3\text{He})^{12}\text{C}$ experimental data using Modified diffraction model (MDM, [3,4]) was done.

1. Z. H. Liu, Phys. Rev. C 64, 034312 (2001).
2. T. L. Belyaeva et al., Phys. Rev. C 90, 064610 (2014).
3. A.N. Danilov et al., Phys. Rev. C 80, 054603 (2009)
4. A.S. Demyanova et al., Phys. Atom. Nucl., 80, 831 (2017)
5. T.L. Belyaeva et al., EPJ Web Conf., 165, 01004 (2017)
6. T.L. Belyaeva et al., Phys. Rev. C 98, 034602 (2018)

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