

RCNP

NUCLEAR PHYSICS THEORY SEMINAR

Title	Investigation of Beryllium isotopes with the THSR approach
Speaker	Mengjiao Lyu (RCNP)
Date/Time	Tuesday, April 18, 2017, at 10:30AM
Place	Lecture room 1, 6th floor, RCNP

Abstract:

To describe the α -cluster condensation in self-conjugate nuclei, the Tohsaki-Horiuchi-Schuck-Röpke (THSR) wave function is proposed and triggers a series of investigations for self-conjugate nuclei, especially the successful treatment of the famous Hoyle (0^+) state in ^{12}C [1]. Recently, based on this THSR wave function, the nonlocalized clustering effects is discovered, which provides a brand new concept for the cluster dynamics in light nuclei [2].

In this talk [3-5], we extend the THSR approach to the neutron-rich isotopes of Be nucleus. The THSR wave functions are formulated for different cluster states of ^{9-11}Be isotopes. Systematical calculations are performed for Be isotopes with these wave functions and the isospin-dependent spin-orbit interaction strength. The π -orbit and σ -orbit structures of the Be isotopes are correctly described and further illustrated by calculating the density distribution of valence neutrons. Important questions such as the nonlocalized dynamics of α -clusters and the intruder $1/2^+$ ground state of ^{11}Be are also discussed.

References

- [1] A. Tohsaki, H. Horiuchi, P. Schuck, and G. Röpke, Phys. Rev. Lett. 87, 192501 (2001).
- [2] B. Zhou, Y. Funaki, H. Horiuchi, Z. Ren, G. Röpke, P. Schuck, A. Tohsaki, C. Xu, and T. Yamada, Phys. Rev. Lett. 110, 262501 (2013).
- [3] M. Lyu, Z. Ren, B. Zhou, Y. Funaki, H. Horiuchi, G. Röpke, P. Schuck, A. Tohsaki, C. Xu, and T. Yamada, Phys. Rev. C 91, 014313 (2015).
- [4] M. Lyu, Z. Ren, B. Zhou, Y. Funaki, H. Horiuchi, G. Röpke, P. Schuck, A. Tohsaki, C. Xu, and T. Yamada, Phys. Rev. C 93, 054308 (2016).
- [5] M. Lyu, Z. Ren, B. Zhou, Y. Funaki, H. Horiuchi, G. Röpke, P. Schuck, A. Tohsaki, C. Xu, and T. Yamada, (to be submitted).

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