

Continuum effects in the excitation spectra of weakly bound nuclei

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Abstract

Starting from realistic nuclear forces and using the Gamow shell model which includes the continuum effect, we have made ab initio calculations for weakly bound nuclei around driplines. The s partial wave with $l = 0$ has a zero centrifugal barrier, and hence a strong coupling to the continuum. Therefore, a state with a remarkable component of the s wave can have significant energy shift, due to the continuum effect in the Gamow shell-model calculation. We will show the spectrum calculations of carbon isotopes where we see that the level order can be changed due to the continuum effect included in calculations [1]. We will also discuss the Thomas-Ehrman shift in mirror nuclei [2]. The mirror asymmetry is also investigated by calculating beta decays.

References

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- [2] S. Zhang, Y.Z. Ma, J.G. Li, B.S. Hu, Q. Yuan, Z.H. Cheng, F.R. Xu, Physics Letters B 827, 136958 (2022).