

Recent progress on the 0^+ dominance

N. Yoshinaga

Department of Physics, Saitama University, Saitama 338-8750, Japan

The ground states of all even-even nuclei have angular momentum I , equal to zero, $I = 0$, and positive parity, $\pi = +$. This feature was believed to be a consequence of the attractive short-range interaction between nucleons. However, a predominance of $I^\pi = 0^+$ dominance was discovered by Johnson, Bertsch and Dean in 1998 using the two-body random ensemble [1]. Since then many efforts have been devoted to understand and solve this problem by many authors from a lot of view points. Still, the underlying physical origin of the $I^\pi = 0^+$ dominance has not been fully understood. Recently we have summarized present status on many-body systems interacting by a two-body ensemble in a review article [2].

In this talk I shall show our recent progress in understanding the 0^+ dominance of many-body systems. Here we demonstrate that the average value and the width of the random Hamiltonian is essentially important to estimate the lowest bound of eigen-energies [3]. Some findings related to the $I^\pi = 0^+$ dominance will also be discussed.

References

- [1] C. W. Johnson, G. F. Bertch and D. J. Dean, *Phy. Rev. Lett.* **80**, 2749 (1998).
- [2] Y. M. Zhao, A. Arima and N. Yoshinaga, *Phys. Rep.* **400**, 1 (2004).
- [3] N. Yoshinaga, A. Arima and Y. M. Zhao, to be published.