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# Effect of nuclear pairing on magnetic-dipole excitation


- Background: Magnetic dipole (M1) excitation is the leading mode of nuclear excitation by the magnetic field, which couples unnatural-parity states. As expected from the form of operator, this mode may provide the information on the spin-related properties, including dineutron and diproton correlations [1-4].
- Purpose: The M1 excitation of two valence nucleons with pairing correlation is investigated. Possibility to utilize the M1 excitation as the probe into the dinucleon correlation is also discussed.
- Method: Three-body model [1-3, 5], which consists of a rigid core and two valence nucleons, is employed. Interactions for its two-body subsystems are phenomenologically determined in order to reproduce the two-body and three-body energies. We also derive the M1 sum rule within the three-body picture. This sum-rule can be utilized to benchmark our model and result.
- Conclusion: A significant role of the pairing correlation to suppress the M1 excitation is shown. The sum-rule value of M1, as well as its strength distribution, can be a suitable observable to probe the effect of pairing, especially on the coupled spin of the valence nucleons.



References:

[1] K. Hagino and H. Sagawa, Phys. Rev. C 72, 044321 (2005).

[2] T. Oishi, K. Hagino, and H. Sagawa, Phys. Rev. C 90, 034303 (2014).

[3] T. Oishi, K. Hagino, and H. Sagawa, Phys. Rev. C 82, 024315 (2010), with erratum.

[4] M. Matsuo, K. Mizuyama, and Y. Serizawa, Phys. Rev. C 71, 064326 (2005).

[5] H. Esbensen, G. F. Bertsch, and K. Hencken, Phys. Rev. C 56, 3054 (1997).



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