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Nuclear magnetic properties from first principles

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Nuclear magnetic properties provide valuable insights into nuclear structure. In particular, the magnetic dipole moment is sensitive to how much the nucleus is dominated by the single-particle picture. Reproducing magnetic dipole moments has been one of the major challenges in nuclear ab initio theory. With the valence-space in-medium similarity renormalization group (VS-IMSRG), one of the ab initio calculation methods applicable for medium-mass and heavy nuclei, it was found that the absolute size of the magnetic dipole moments is underestimated. The effect of two-body current (2BC, also known as the meson exchange current) is non-negligible in light nuclei, as studied by Green's function Monte Carlo and no-core shell model. Thus, including 2BC effects in medium-mass and heavy nuclei calculations is a natural step forward. In this presentation, using the VS-IMSRG, I will discuss the 2BC effect on the magnetic dipole moments of nuclei near doubly magic systems from oxygen to bismuth. Additionally, I will present the effects of 2BC on magnetic transitions and form factors.

Type of contribution

poster

Are you a student or postdoc?

no

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