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Effect of two-body current on magnetic dipole moments

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The magnetic dipole moment is one of the fundamental observable in finite nuclei and can tell us 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 (TBC, 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 TBC effects in medium-mass and heavy nuclei calculation is a natural step forward. In this presentation, using the VS-IMSRG, I will discuss the TBC effect on the magnetic dipole moments of the proximity of doubly magic nuclei from oxygen to bismuth.

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