

Abstract Submitted
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Hyperfine structure of the metastable 3P_2 state of alkaline earth atoms as an accurate probe of nuclear magnetic octupole moments¹ KYLE BELOY, ANDREI DEREVIANKO, University of Nevada, Reno, WALTER JOHNSON, University of Notre Dame — Measuring the hyperfine structure (HFS) of long-lived 3P_2 states of divalent atoms may offer the opportunity of extracting relatively unexplored nuclear magnetic octupole and electric hexadecapole moments. Here, using relativistic many-body methods of atomic structure and the nuclear shell model, we evaluate the effect of these higher nuclear moments on the hyperfine structure. We find that the sensitivity of HFS interval measurements in ^{87}Sr needed to reveal the perturbation caused by the nuclear octupole moment is on the order of kHz. Results of similar analyses for ^9Be , ^{25}Mg , and ^{43}Ca are also reported.

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