NCSM Calculations of Parity-and Time-Reversal Violating Nuclear Properties

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In any finite system, the presence of a non-zero permanent electric dipole moment (EDM) would indicate CP violation beyond the small violation predicted in the Standard Model. We use the *ab initio* no-core shell model (NCSM) framework to theoretically investigate the magnitude of the nuclear EDM. We calculate EDMs of several light nuclei using chiral two- and three-body interactions and a PT-violating Hamiltonian based on a one-meson-exchange model. We will present a benchmark calculation for ^{3}He, as well as results for the more complex nuclei ^{6,7}Li, ^{9}Be, ^{10,11}B, ^{13}C, ^{14,15}N, and ^{19}F. Our results suggest that different nuclei can be used to probe different terms of the PT violating interaction. These calculations allow us to suggest which nuclei may be good candidates in the search for a measurable permanent electric dipole moment. In addition, we will discuss NCSM calculations of anapole moments of nuclei relevant for experiments with triatomic molecules composed of light elements Be, Mg, N, and C.