MAGNETIC HYPERFINE INTERACTIONS IN ^{171}YbF AND ^{173}YbF[a].

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The heavy polar molecule ytterbium monofluoride, YbF, has been used to set an upper limit on the electric-dipole moment of the electron, d_e[b]. The extraction of d_e from experimental data requires knowledge of the effective electric field in the region of the Yb nucleus, which can only be obtained from electron structure calculations[c]. The most effective means of gauging the quality of the predicted wavefunction in the region of the nucleus is via a comparison with experimental measurements of the magnetic hyperfine interactions. Here we report on ^{171}Yb(I=1/2), ^{173}Yb(I=5/2), and ^{19}F(I=1/2) magnetic hyperfine interactions from the analysis of the $A^2\Pi_{1/2} - X^2\Sigma^+$ (0,0) band of ytterbium monofluoride, YbF, recorded at the near-natural linewidth limit. The results are compared with *ab initio* predictions[b], the microwave measurements for ^{174}YbF[d], and the matrix-isolated ESR results for ^{171}YbF[e].

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