

FINE AND HYPERFINE STRUCTURE OF ^{173}YbF

HAILING WANG, *Physics Department , East China Normal University , Shanghai, China*; TIMOTHY STEIMLE, *School of Molecular Sciences, Arizona State University, Tempe, AZ, USA*; RICHARD MAWHORTER, *Department of Physics and Astronomy, Pomona College, Claremont, CA, USA*; JENS-UWE GRABOW, *Institut für Physikalische Chemie und Elektrochemie, Gottfried-Wilhelm-Leibniz-Universität, Hannover, Germany*.

^{174}YbF has been used for some time in attempts to determine the electrostatic T,P violating electron electric dipole moment (eEDM). It was recently pointed out [1] that ^{173}YbF may be an avenue for determining an EDM induced by the magnetic quadrupole moment (MQM). As in the eEDM case, here the molecular properties of ^{173}YbF are experimentally advantageous. We report a detailed analysis of the fine and hyperfine structure in the $X^2\Sigma^+$ state from a combined analysis of rotational and optical transitions. Numerous hyperfine components in the $N=4 \rightarrow 5$ and $N=3 \rightarrow 4$ rotational transitions were recorded using a separated field pump/probe microwave optical double resonance technique. Fourier transform microwave spectroscopy was used to record five features of the $N=0 \rightarrow 1$ rotational transition. This rotational data was combined with precisely measured $(0,0) A^2\Pi_{1/2} - X^2\Sigma^+$ optical transitions of a cold molecular beam sample. Resulting fine and hyperfine parameters will be discussed and compared with recent theory [2].

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1. V.V. Flambaum, et al., arXiv:1810.02477v2 [hep-ph] (10 Dec 2018)
2. P. Schwerdtfeger, et al., Mol. Phys. 114, 1110 (2016)