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Evaluation of a possible optical e-EDM measurement HAOQUAN FAN, JAMES COKER, TAO ZH. YANG, JERRY GILLEAN, N.E. SHAFER-RAY, University of Oklahoma — Since its proposed existence by Purcell and Ramsey in 1950, the possibility of an electron electric dipole moment (e-EDM) has been the subject of extensive theoretical and experimental investigation. Here we describe an ongoing effort to probe for an e-EDM by measuring the energy difference between two states of the PbF molecule that differ only by their orientation with respect to an applied external electric field. Specifically, we describe a possible optical Ramsey resonance experiment utilizing rotating linearly polarized light. We present initial tests of this scheme, including measurement of a small angle of rotation of a polarized beam splitter and measurement of optical Stark spectroscopy of the PbF molecule. We discuss these results and the limitations they place on a measurement of an e-EDM.

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