STARK SPECTROSCOPY OF PBF MOLECULE

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In 1950 Purcell and Ramsey (Phys. Rev. 78, 807-807, 1950) suggested that the electron may have an electron's electric dipole moment (e-EDM). Such a dipole moment could influence the Stark spectra of heavy diatomic molecules. The lead mono-fluoride (PbF) molecule has a large dipole moment combined with closely spaced levels of opposite parity. This feature reduces the magnitude of the external electric field required to become sensitive to the e-EDM. A multi-photon ionization technique pseudo-continuous-REMPI (pc-REMPI) is utilized for Stark spectroscopy of PbF molecule. We analyze data in terms of an spin-rotational Hamiltonian to determine the dipole moment of the PbF molecule. The results will compare to the theoretical ones and some implications of measuring e-EDM are discussed.