THE EFFECTIVE HAMILTONIAN FOR THE GROUND STATE OF $^{207}Pb^{19}F$ AND NEW MEASUREMENTS OF THE FINE STRUCTURE SPECTRUM NEAR 1.2 μm.

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We have measured rotational transitions in the ground, $X_1\ ^2\Pi_{1/2}$, electronic state of naturally occuring isotopomers of PbF in a supersonic free jet Fourier transform microwave spectrometer. The data for $^{207}Pb^{19}F$ is particularly interesting because it is a candidate for a future experimental e-EDM measurement. To fit the data for this species to the measurement precision, the nuclear spin-spin dipolar interaction and a second term that can be equivalently viewed as a centrifugal distortion correction to the familiar Frosch and Foley hyperfine coupling terms, or an $\Omega-$ dependent correction to the nuclear spin-rotational coupling are required, in addition to the standard terms. To characterize the higher $X_2\ ^2\Pi_{3/2}$ component of the ground state of PbF, we are attempting a direct measurement of transitions between the two components in a slit jet-cooled sample using a frequency comb-referenced extended cavity diode laser. This spectrum was originally detected in a hot source by Fourier transform near-infrared spectroscopy,[b] but low$-J$ transitions were unresolved at that time.

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