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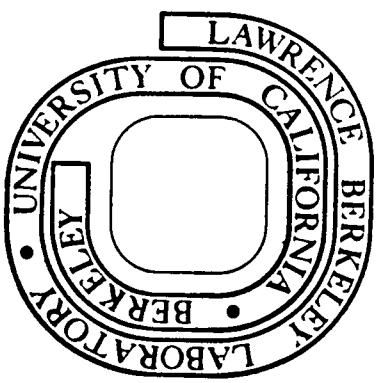

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THE RADIOFREQUENCY SPECTRA OF LiF BY THE MOLECULAR BEAM ELECTRIC RESONANCE METHOD*

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The molecular beam electric resonance method has been used to obtain dipole moments, μ_v, lithium quadrupole interaction constants, eqQ, spin-rotation interaction constants, c_F and c_{Li}, and spin-spin interaction constants, c_3 and c_4, for $^6Li^{19}F$ and $^7Li^{19}F$ in several of the lower vibrational levels. The observation of spectra for the three lowest vibrational states resulted in the following values.

All hyperfine constants are given in kc/sec.

$^6Li^{19}F$:

$$\mu_v = 6.2841 + 0.08627\ (v + 1/2) + 0.00054_5(v + 1/2)^2 \pm 0.001 \text{ Debye}$$

	v=0	v=1	v=2
eqQ	8.5 ± 0.8	8.6 ± 1.2	7.1 ± 2.0
c_{Li}	0.71 ± 0.08	0.71 ± 0.12	0.73 ± 0.20
c_F	36.8 ± 0.4	36.1 ± 0.5	35.7 ± 0.7
c_3	4.307 ± 0.08	4.224 ± 0.12	4.140 ± 0.20
c_4	0.00 ± 0.15	0.00 ± 0.20	0.00 ± 0.40

$^{7}Li^{19}F$:

$$\mu_v = 6.2839 + 0.08153(\ + 1/2) + 0.000445(v + 1/2)^2 \pm 0.001 \text{ Debye}$$

	v=0	v=1	v=2
eqQ	415.6 ± 0.4	406.1 ± 0.6	396.5 ± 0.8
c_{Li}	1.87 ± 0.04	1.84 ± 0.04	1.79 ± 0.04
c_F	32.68 ± 0.16	32.20 ± 0.22	31.84 ± 0.24
c_3	11.382 ± 0.020	11.173 ± 0.030	10.964 ± 0.030
c_4	0.00 ± 0.08	0.00 ± 0.11	0.00 ± 0.14

These results are in general agreement with those reported earlier by Wharton, Gold, and Klemperer with the exception of the spin-spin interaction constant, c_3, for which they obtain a value of 0.21 ± .04 kc/sec, while our best values for the J # 1 and 2 and V = 0,1,2 levels of $^{7}Li^{19}F$ are all 0.0 ± 0.1 kc/sec.

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[1] L. Wharton, L. P. Gold, and W. Klemperer, Phys. Rev. 133, B 270 (1964).

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