The Microwave Spectrum and Molecular Structure of (*Z*)-1-Chloro-2-Fluoroethylene–Acetylene: Demonstrating the Importance of the Balance Between Steric and Electrostatic Interactions in Heterodimer Formation

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Table S1 presents the atomic coordinates in the appropriate principal inertial axis system for each of the four theoretical structures presented in Figure 2 of the manuscript.

Tables S2 through S9 contain the quantum number assignments, observed transition frequencies (in MHz), and the residuals (obs. - calc., also in MHz) from the least squares fits. The first three quantum numbers are J, K_a, and K_c, the usual asymmetric top rotational quantum numbers. The fourth number is F where $F = J + I_{\mathrm{Cl}}$, where $I_{\mathrm{Cl}} = 3/2$ is the spin angular momentum of the chlorine nucleus, in (*Z*)-1-chloro-2-fluoroethylene.

The complete reference for Gaussian 09 (reference 14) is given here.

Frisch, M. J.; Trucks, G. W.; Schlegel, H. B.; Scuseria, G. E.; Robb, M. A.; Cheeseman, J. R.; Scalmani, G.; Barone, V.; Mennucci, B.; Petersson, G. A.; Nakatsuji, H.; Caricato, M.; Li, X.; Hratchian, H. P.; Izmaylov, A. F.; Bloino, J.; Zheng, G.; Sonnenberg, J. L.; Hada, M.; Ehara, M.; Toyota, K.; Fukuda, R.; Hasegawa, J.; Ishida, M.; Nakajima, T.; Honda, Y.; Kitao, O.; Nakai, H.; Vreven, T.; Montgomery, J. A., Jr.; Peralta, J. E.; Ogliaro, F.; Bearpark, M.; Heyd, J. J.; Brothers, E.; Kudin, K. N.; Staroverov, V. N.; Kobayashi, R.; Normand, J.; Raghavachari, K.; Rendell, A.; Burant, J. C.; Iyengar, S. S.; Tomasi, J.; Cossi, M.; Rega, N.; Millam, J. M.; Klene, M.; Knox, J. E.; Cross, J. B.; Bakken, V.; Adamo, C.; Jaramillo, J.; Gomperts, R.; Stratmann, R. E.; Yazyev, O.; Austin, A. J.; Cammi, R.; Pomelli, C.; Ochterski, J. W.; Martin, R. L.; Morokuma, K.; Zakrzewski, V. G.; Voth, G. A.; Salvador, P.; Dannenberg, J. J.; Dapprich, S.; Daniels, A. D.; Farkas, O.; Foresman, J. B.; Ortiz, J. V.; Cioslowski, J.; Fox, D. J. *Gaussian 09*, Revision B.01; Gaussian, Inc.: Wallingford, CT, 2009.

Table S1: Principal inertial axis system coordinates for the 4 theoretical structures in Fig. 2.

	Structure (a)			Structure (b)		
(*Z*)-1-chloro-2-fluoroethylene subunit						
	a	*b*	*c*	*a*	*b*	*c*
C-1	-1.1178	0.8903	0.0000	-0.9855	-0.1769	0.9334
H-1	-1.3529	1.9751	0.0000	-1.2268	0.1513	1.9659
Cl	-2.5787	-0.0344	0.0000	-1.4851	1.0256	-0.2042
C-2	0.0782	0.3460	0.0000	-0.4070	-1.3032	0.5823
H-2	1.0072	0.9027	0.0000	-0.0853	-2.0712	1.2748
F	0.2568	-0.9871	0.0000	-0.1574	-1.6080	-0.7037
HCCH subunit						
H	2.8145	-1.2732	0.0000	1.3855	0.5980	-0.9003
C	3.4236	-0.4086	0.0000	2.2884	0.5693	-0.3504
C	4.1195	0.5791	0.0000	3.3200	0.5365	0.2779
H	4.7286	1.4437	0.0000	4.2229	0.5078	0.8277

	Structure (c)			Structure (d)		
(*Z*)-1-chloro-2-fluoroethylene subunit						
	a	*b*	*c*	*a*	*b*	*c*
C-1	0.3662	0.4544	0.0000	0.2759	0.3341	0.0000
H-1	-0.6740	0.8417	0.0000	-0.4664	1.1594	-0.0001
Cl	0.3566	-1.2746	0.0000	1.8805	0.9781	0.0000
C-2	1.4697	1.1678	0.0000	0.0177	-0.9543	0.0000
H-2	1.5022	2.2503	0.0000	-0.9772	-1.3821	0.0000
F	2.6885	0.5989	0.0000	0.9944	-1.8790	0.0000
HCCH subunit						
H	-3.9315	1.9535	0.0000	-3.3336	0.3519	-1.6617
C	-3.5433	0.9698	0.0000	-3.3335	0.3521	-0.6041
C	-3.0999	-0.1542	0.0000	-3.3333	0.3523	0.6042
H	-2.7117	-1.1380	0.0000	-3.3331	0.3524	1.6617

Table S2: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
5	1	4	3.5	5	0	5	3.5	5503.0317	-0.0009
5	1	4	6.5	5	0	5	6.5	5507.4135	-0.0003
5	1	4	4.5	5	0	5	4.5	5518.5843	-0.0009
5	1	4	5.5	5	0	5	5.5	5523.0231	-0.0003
3	0	3	1.5	2	0	2	2.5	5739.4053	-0.0033
1	1	1	1.5	0	0	0	1.5	5740.4890	-0.0012
3	0	3	1.5	2	0	2	1.5	5746.0408	-0.0004
3	0	3	2.5	2	0	2	2.5	5747.7883	-0.0008
3	0	3	3.5	2	0	2	2.5	5751.6749	-0.0005
3	0	3	4.5	2	0	2	3.5	5752.6315	-0.0003
3	0	3	2.5	2	0	2	1.5	5754.4227	0.0009
3	0	3	1.5	2	0	2	0.5	5755.3850	0.0006
1	1	1	2.5	0	0	0	1.5	5758.6455	0.0017
3	0	3	3.5	2	0	2	3.5	5760.9952	-0.0010
3	2	2	1.5	2	2	1	0.5	5769.7155	0.0006
1	1	1	0.5	0	0	0	1.5	5773.1932	-0.0020
3	2	2	4.5	2	2	1	3.5	5776.8178	-0.0008
3	2	2	2.5	2	2	1	1.5	5779.6668	-0.0002
3	2	2	3.5	2	2	1	2.5	5786.7839	0.0004
3	2	1	1.5	2	2	0	0.5	5795.9583	-0.0002
3	2	1	4.5	2	2	0	3.5	5803.3355	-0.0003
3	2	1	2.5	2	2	0	1.5	5806.8624	0.0010
3	2	1	3.5	2	2	0	2.5	5814.2619	0.0007
3	1	2	1.5	2	1	1	1.5	6040.6242	-0.0008
3	1	2	2.5	2	1	1	2.5	6048.0406	-0.0012
3	1	2	4.5	2	1	1	3.5	6055.3198	-0.0003
3	1	2	3.5	2	1	1	2.5	6057.6051	-0.0001
3	1	2	1.5	2	1	1	0.5	6058.7445	-0.0001
3	1	2	2.5	2	1	1	1.5	6061.0475	-0.0001
3	1	2	3.5	2	1	1	3.5	6075.7835	-0.0007
6	1	5	4.5	6	0	6	5.5	6230.1369	-0.0029
6	1	5	4.5	6	0	6	4.5	6234.0557	-0.0002
6	1	5	7.5	6	0	6	6.5	6234.1816	-0.0014
6	1	5	7.5	6	0	6	7.5	6238.0585	-0.0008
6	1	5	5.5	6	0	6	6.5	6250.1622	-0.0044
6	1	5	5.5	6	0	6	5.5	6251.0581	-0.0005
6	1	5	5.5	6	0	6	4.5	6254.9715	-0.0033
6	1	5	6.5	6	0	6	6.5	6255.1235	-0.0008
6	1	5	6.5	6	0	6	5.5	6256.0142	-0.0021
6	1	5	6.5	6	0	6	7.5	6258.9982	-0.0024
5	0	5	3.5	4	1	4	2.5	6425.7605	-0.0006
5	0	5	6.5	4	1	4	5.5	6429.2108	-0.0001
5	0	5	3.5	4	1	4	3.5	6430.9823	0.0002

Table S2: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
5	0	5	5.5	4	1	4	5.5	6434.8032	-0.0018
5	0	5	4.5	4	1	4	3.5	6436.6066	0.0004
5	0	5	4.5	4	1	4	4.5	6438.4344	-0.0007
5	0	5	5.5	4	1	4	4.5	6439.9866	0.0001
2	2	0	2.5	3	1	3	2.5	6554.9477	-0.0009
2	2	0	1.5	3	1	3	1.5	6555.6641	0.0030
2	2	0	2.5	3	1	3	3.5	6557.7171	0.0011
2	2	0	3.5	3	1	3	4.5	6561.1417	0.0010
2	2	0	1.5	3	1	3	2.5	6561.5964	-0.0004
2	2	0	0.5	3	1	3	1.5	6564.9996	-0.0047
2	2	0	3.5	3	1	3	3.5	6567.0267	0.0033
8	1	7	6.5	7	2	6	5.5	6757.7691	0.0012
8	1	7	9.5	7	2	6	8.5	6759.8550	0.0002
8	1	7	7.5	7	2	6	6.5	6770.6594	0.0025
8	1	7	8.5	7	2	6	7.5	6772.8730	0.0014
7	1	6	5.5	7	0	7	5.5	7143.8084	0.0016
7	1	6	8.5	7	0	7	7.5	7145.4669	-0.0018
7	1	6	8.5	7	0	7	8.5	7147.5100	-0.0008
7	1	6	6.5	7	0	7	7.5	7161.7406	-0.0031
7	1	6	6.5	7	0	7	6.5	7162.1282	0.0001
7	1	6	6.5	7	0	7	5.5	7164.2332	-0.0005
7	1	6	7.5	7	0	7	7.5	7165.9142	-0.0003
7	1	6	7.5	7	0	7	6.5	7166.2984	-0.0005
7	1	6	7.5	7	0	7	8.5	7167.9560	-0.0005
4	1	4	4.5	3	1	3	4.5	7312.3651	-0.0015
4	1	4	3.5	3	1	3	4.5	7314.1947	-0.0008
4	1	4	2.5	3	1	3	1.5	7316.5961	-0.0001
4	1	4	3.5	3	1	3	2.5	7317.3109	0.0001
4	1	4	5.5	3	1	3	4.5	7317.5481	0.0000
4	1	4	4.5	3	1	3	3.5	7318.2493	-0.0001
4	1	4	3.5	3	1	3	3.5	7320.0770	-0.0012
4	1	4	2.5	3	1	3	2.5	7322.5306	-0.0013
4	1	4	2.5	3	1	3	3.5	7325.2946	-0.0046
2	1	2	2.5	1	0	1	1.5	7480.0394	-0.0009
2	1	2	1.5	1	0	1	1.5	7485.9306	-0.0021
2	1	2	2.5	1	0	1	2.5	7490.0048	-0.0001
2	1	2	0.5	1	0	1	1.5	7494.1557	-0.0021
2	1	2	1.5	1	0	1	2.5	7495.8961	-0.0013
2	1	2	3.5	1	0	1	2.5	7498.1695	0.0014
2	1	2	1.5	1	0	1	0.5	7503.8554	-0.0001
2	1	2	0.5	1	0	1	0.5	7512.0797	-0.0008
4	0	4	2.5	3	0	3	3.5	7628.5682	-0.0021
4	0	4	2.5	3	0	3	2.5	7632.4550	-0.0016

Table S2: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
4	0	4	3.5	3	0	3	3.5	7635.6971	-0.0015
4	0	4	4.5	3	0	3	3.5	7638.1800	0.0007
4	0	4	5.5	3	0	3	4.5	7639.4333	0.0000
4	0	4	3.5	3	0	3	2.5	7639.5855	0.0007
4	0	4	2.5	3	0	3	1.5	7640.8364	-0.0008
4	0	4	3.5	3	0	3	4.5	7644.0653	0.0023
4	0	4	4.5	3	0	3	4.5	7646.5445	0.0008
5	3	3	5.5	6	2	4	6.5	7672.4911	-0.0014
5	3	3	4.5	6	2	4	5.5	7674.9562	-0.0020
5	3	3	6.5	6	2	4	7.5	7683.2717	0.0015
5	3	3	3.5	6	2	4	4.5	7685.7441	-0.0016
4	2	3	2.5	3	2	2	1.5	7698.1000	0.0004
4	2	3	5.5	3	2	2	4.5	7699.4596	-0.0005
4	2	3	3.5	3	2	2	2.5	7701.9504	0.0004
4	2	3	4.5	3	2	2	3.5	7703.2847	0.0002
4	3	2	2.5	3	3	1	1.5	7711.4878	0.0029
4	3	1	2.5	3	3	0	1.5	7712.3685	0.0017
4	3	2	5.5	3	3	1	4.5	7716.1404	0.0001
4	3	1	5.5	3	3	0	4.5	7717.0329	-0.0001
4	3	2	3.5	3	3	1	2.5	7720.7260	0.0008
4	3	1	3.5	3	3	0	2.5	7721.6425	0.0010
4	3	2	2.5	3	3	1	2.5	7723.7531	0.0015
4	3	1	2.5	3	3	0	2.5	7724.6184	-0.0044
4	3	2	4.5	3	3	1	3.5	7725.3976	0.0005
4	3	1	4.5	3	3	0	3.5	7726.3242	-0.0003
4	3	2	3.5	3	3	1	3.5	7726.4380	-0.0013
4	3	1	3.5	3	3	0	3.5	7727.3471	-0.0033
4	2	2	2.5	3	2	1	2.5	7762.6003	-0.0001
4	2	2	2.5	3	2	1	1.5	7764.1604	0.0003
4	2	2	5.5	3	2	1	4.5	7765.7778	0.0002
4	2	2	3.5	3	2	1	3.5	7768.5039	-0.0012
4	2	2	3.5	3	2	1	2.5	7769.2578	0.0008
4	2	2	4.5	3	2	1	3.5	7770.8542	0.0005
4	2	2	4.5	3	2	1	4.5	7772.4688	-0.0030
4	1	3	2.5	3	1	2	3.5	8038.8352	0.0001
4	1	3	2.5	3	1	2	2.5	8048.3966	-0.0019
4	1	3	3.5	3	1	2	3.5	8059.9382	-0.0015
4	1	3	5.5	3	1	2	4.5	8066.6888	-0.0002
4	1	3	4.5	3	1	2	3.5	8067.3618	-0.0004
4	1	3	2.5	3	1	2	1.5	8068.8210	0.0000
4	1	3	3.5	3	1	2	2.5	8069.5032	0.0001
4	1	3	3.5	3	1	2	4.5	8080.4125	0.0087
4	1	3	4.5	3	1	2	4.5	8087.8256	-0.0006

Table S2: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
5	3	2	4.5	6	2	5	5.5	8140.3935	-0.0026
5	3	2	6.5	6	2	5	7.5	8144.0036	0.0011
5	3	2	3.5	6	2	5	4.5	8145.0347	-0.0023
8	1	7	6.5	8	0	8	6.5	8244.5683	-0.0006
8	1	7	9.5	8	0	8	9.5	8247.9747	0.0006
8	1	7	7.5	8	0	8	7.5	8263.9980	-0.0001
8	1	7	8.5	8	0	8	8.5	8267.5453	-0.0006
6	0	6	4.5	5	1	5	3.5	8624.0429	0.0000
6	0	6	7.5	5	1	5	6.5	8626.4358	-0.0005
6	0	6	4.5	5	1	5	4.5	8629.1157	-0.0012
6	0	6	6.5	5	1	5	6.5	8630.3117	-0.0009
6	0	6	5.5	5	1	5	4.5	8633.0331	0.0000
6	0	6	5.5	5	1	5	5.5	8634.4620	-0.0015
6	0	6	6.5	5	1	5	5.5	8635.3555	0.0000
5	1	5	5.5	4	1	4	5.5	9130.2562	-0.0015
3	1	3	3.5	2	0	2	2.5	9130.7830	0.0003
3	1	3	2.5	2	0	2	2.5	9133.5491	-0.0010
5	1	5	3.5	4	1	4	2.5	9134.8934	-0.0002
5	1	5	4.5	4	1	4	3.5	9135.0405	-0.0002
5	1	5	6.5	4	1	4	5.5	9135.3006	-0.0001
5	1	5	5.5	4	1	4	4.5	9135.4392	0.0000
5	1	5	4.5	4	1	4	4.5	9136.8681	-0.0015
3	1	3	1.5	2	0	2	2.5	9139.4833	-0.0025
3	1	3	3.5	2	0	2	3.5	9140.1027	-0.0008
5	1	5	3.5	4	1	4	3.5	9140.1176	0.0029
3	1	3	2.5	2	0	2	1.5	9140.1828	0.0000
3	1	3	2.5	2	0	2	3.5	9142.8694	-0.0014
3	1	3	4.5	2	0	2	3.5	9145.9873	0.0010
3	1	3	1.5	2	0	2	1.5	9146.1195	0.0011
3	1	3	1.5	2	0	2	0.5	9155.4626	0.0010
9	1	8	7.5	8	2	7	6.5	9380.3981	0.0002
9	1	8	10.5	8	2	7	9.5	9381.6336	-0.0012
9	1	8	8.5	8	2	7	7.5	9391.7443	0.0019
9	1	8	9.5	8	2	7	8.5	9394.1837	0.0001
5	0	5	3.5	4	0	4	4.5	9491.9874	-0.0009
5	0	5	3.5	4	0	4	3.5	9494.4676	-0.0015
5	0	5	4.5	4	0	4	4.5	9497.6113	-0.0011
5	0	5	5.5	4	0	4	4.5	9499.1636	-0.0002
5	0	5	4.5	4	0	4	3.5	9500.0929	-0.0004
5	0	5	6.5	4	0	4	5.5	9500.6803	0.0001
5	0	5	3.5	4	0	4	2.5	9501.5970	-0.0004
5	0	5	4.5	4	0	4	5.5	9504.7241	0.0013
5	0	5	5.5	4	0	4	5.5	9506.2737	-0.0005

Table S2: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
9	1	8	7.5	9	0	9	7.5	9540.3268	-0.0014
9	1	8	10.5	9	0	9	10.5	9542.9080	0.0005
9	1	8	8.5	9	0	9	8.5	9560.0398	0.0004
9	1	8	9.5	9	0	9	9.5	9563.8348	0.0001
5	2	4	3.5	4	2	3	3.5	9612.6255	-0.0004
5	2	4	3.5	4	2	3	2.5	9616.4568	0.0006
5	2	4	6.5	4	2	3	5.5	9616.7021	-0.0002
5	2	4	4.5	4	2	3	4.5	9616.8886	-0.0014
5	2	4	4.5	4	2	3	3.5	9618.2276	-0.0003
5	2	4	5.5	4	2	3	4.5	9618.4497	-0.0001
5	2	4	5.5	4	2	3	5.5	9622.2881	-0.0033
5	3	3	3.5	4	3	2	2.5	9650.7376	0.0011
5	3	3	6.5	4	3	2	5.5	9652.2787	-0.0005
5	3	2	6.5	4	3	1	5.5	9655.4121	-0.0011
5	3	3	4.5	4	3	2	3.5	9655.4606	0.0012
5	3	3	4.5	4	3	2	4.5	9656.4993	-0.0024
5	3	2	3.5	4	3	1	3.5	9656.8339	0.0006
5	3	3	5.5	4	3	2	4.5	9656.9922	0.0003
5	3	2	4.5	4	3	1	3.5	9658.6507	0.0009
5	3	2	4.5	4	3	1	4.5	9659.6725	-0.0032
5	3	2	5.5	4	3	1	4.5	9660.2022	0.0009
5	2	3	3.5	4	2	2	3.5	9741.0118	-0.0006
5	2	3	3.5	4	2	2	2.5	9747.6693	0.0002
5	2	3	6.5	4	2	2	5.5	9748.1418	-0.0006
5	2	3	4.5	4	2	2	4.5	9748.5957	-0.0012
5	2	3	4.5	4	2	2	3.5	9750.9454	0.0000
5	2	3	5.5	4	2	2	4.5	9751.4069	0.0001
5	2	3	5.5	4	2	2	5.5	9758.0986	-0.0024
4	3	2	4.5	5	2	3	5.5	9771.7033	-0.0018
4	3	2	3.5	5	2	3	4.5	9775.5543	-0.0029
4	3	2	5.5	5	2	3	6.5	9784.6538	0.0022
4	3	2	2.5	5	2	3	3.5	9788.5139	-0.0026
9	2	7	9.5	9	1	8	9.5	9820.4222	-0.0004
9	2	7	8.5	9	1	8	8.5	9820.5408	0.0004
9	2	7	10.5	9	1	8	10.5	9821.1537	0.0002
9	2	7	7.5	9	1	8	7.5	9821.2687	-0.0003
8	2	6	9.5	8	1	7	8.5	9858.4977	0.0035
8	2	6	6.5	8	1	7	7.5	9859.0663	-0.0015
8	2	6	7.5	8	1	7	8.5	9872.0794	-0.0017
8	2	6	8.5	8	1	7	8.5	9875.0424	-0.0007
8	2	6	7.5	8	1	7	7.5	9875.6055	-0.0005
8	2	6	9.5	8	1	7	9.5	9878.2462	0.0008
8	2	6	8.5	8	1	7	7.5	9878.5712	0.0031

Table S2: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
8	2	6	6.5	8	1	7	6.5	9878.8060	-0.0008
8	2	6	8.5	8	1	7	9.5	9894.7931	-0.0012
8	2	6	7.5	8	1	7	6.5	9895.3464	0.0014
10	2	8	8.5	10	1	9	8.5	9911.6958	-0.0018
10	2	8	11.5	10	1	9	11.5	9911.9314	0.0019
10	2	8	9.5	10	1	9	9.5	9913.3083	-0.0016
10	2	8	10.5	10	1	9	10.5	9913.5434	0.0005
4	3	1	4.5	5	2	4	5.5	10007.9886	0.0002
4	3	1	3.5	5	2	4	4.5	10010.5729	-0.0012
4	3	1	5.5	5	2	4	6.5	10016.5225	0.0025
4	3	1	2.5	5	2	4	3.5	10019.1562	-0.0013
7	2	5	8.5	7	1	6	7.5	10033.5107	0.0031
7	2	5	5.5	7	1	6	6.5	10034.7032	-0.0013
7	2	5	6.5	7	1	6	7.5	10045.1874	-0.0024
7	2	5	7.5	7	1	6	7.5	10048.1771	-0.0005
7	2	5	6.5	7	1	6	6.5	10049.3597	-0.0009
5	1	4	3.5	4	1	3	3.5	10050.3829	-0.0016
7	2	5	7.5	7	1	6	6.5	10052.3501	0.0017
7	2	5	8.5	7	1	6	8.5	10053.9545	0.0010
7	2	5	5.5	7	1	6	5.5	10055.1308	-0.0007
5	1	4	4.5	4	1	3	4.5	10064.1373	-0.0015
7	2	5	7.5	7	1	6	8.5	10068.6219	-0.0015
7	2	5	6.5	7	1	6	5.5	10069.7881	0.0006
5	1	4	6.5	4	1	3	5.5	10070.0625	0.0004
5	1	4	5.5	4	1	3	4.5	10070.1282	-0.0001
5	1	4	3.5	4	1	3	2.5	10071.4893	0.0002
5	1	4	4.5	4	1	3	3.5	10071.5608	-0.0005
5	1	4	5.5	4	1	3	5.5	10091.2643	-0.0013
11	2	9	9.5	11	1	10	9.5	10174.7756	-0.0001
11	2	9	12.5	11	1	10	12.5	10175.2769	0.0033
11	2	9	10.5	11	1	10	10.5	10178.5862	0.0024
11	2	9	11.5	11	1	10	11.5	10179.0910	0.0012
6	2	4	7.5	6	1	5	6.5	10293.7736	0.0022
6	2	4	4.5	6	1	5	5.5	10295.7904	-0.0012
6	2	4	5.5	6	1	5	6.5	10303.3165	-0.0015
6	2	4	6.5	6	1	5	6.5	10306.2736	-0.0004
6	2	4	5.5	6	1	5	5.5	10308.2749	-0.0008
6	2	4	6.5	6	1	5	5.5	10311.2322	0.0006
6	2	4	7.5	6	1	5	7.5	10314.7141	0.0014
6	2	4	4.5	6	1	5	4.5	10316.7098	-0.0006
6	2	4	6.5	6	1	5	7.5	10327.2136	-0.0016
6	2	4	5.5	6	1	5	4.5	10329.1956	0.0010
5	2	3	6.5	5	1	4	5.5	10603.0231	0.0030

Table S2: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
5	2	3	3.5	5	1	4	4.5	10606.2231	-0.0022
5	2	3	4.5	5	1	4	5.5	10610.1671	-0.0016
5	2	3	5.5	5	1	4	5.5	10612.9780	-0.0006
5	2	3	4.5	5	1	4	4.5	10616.1571	-0.0012
5	2	3	5.5	5	1	4	4.5	10618.9689	0.0008
5	2	3	6.5	5	1	4	6.5	10624.2248	0.0011
5	2	3	3.5	5	1	4	3.5	10627.4011	-0.0010
5	2	3	5.5	5	1	4	6.5	10634.1808	-0.0013
5	2	3	4.5	5	1	4	3.5	10637.3354	0.0003
4	1	4	4.5	3	0	3	3.5	10697.3569	0.0002
4	1	4	3.5	3	0	3	3.5	10699.1842	-0.0014
4	1	4	3.5	3	0	3	2.5	10703.0713	-0.0005
4	1	4	2.5	3	0	3	3.5	10704.4043	-0.0023
4	1	4	4.5	3	0	3	4.5	10705.7206	-0.0005
4	1	4	3.5	3	0	3	4.5	10707.5499	0.0000
4	1	4	2.5	3	0	3	2.5	10708.2914	-0.0015
4	1	4	5.5	3	0	3	4.5	10710.9037	0.0011
4	1	4	2.5	3	0	3	1.5	10716.6728	-0.0007
7	0	7	5.5	6	1	6	4.5	10812.5922	-0.0002
7	0	7	8.5	6	1	6	7.5	10814.2935	-0.0004
7	0	7	7.5	6	1	6	7.5	10816.3346	-0.0014
7	0	7	5.5	6	1	6	5.5	10817.7868	-0.0010
7	0	7	6.5	6	1	6	5.5	10819.8935	0.0001
7	0	7	6.5	6	1	6	6.5	10821.1208	-0.0006
7	0	7	7.5	6	1	6	6.5	10821.5058	0.0000
4	2	2	5.5	4	1	3	4.5	10925.0088	0.0028
4	2	2	3.5	4	1	3	4.5	10929.3499	-0.0017
4	2	2	2.5	4	1	3	3.5	10930.1178	0.0004
4	2	2	4.5	4	1	3	4.5	10931.6995	-0.0007
4	2	2	3.5	4	1	3	3.5	10936.7733	-0.0008
4	2	2	4.5	4	1	3	3.5	10939.1237	0.0011
6	1	6	6.5	5	1	5	6.5	10940.7531	-0.0012
6	1	6	5.5	5	1	5	4.5	10945.5947	-0.0001
6	1	6	4.5	5	1	5	3.5	10945.7173	0.0011
6	1	6	6.5	5	1	5	5.5	10945.7972	0.0001
6	1	6	7.5	5	1	5	6.5	10945.9241	0.0000
4	2	2	5.5	4	1	3	5.5	10946.1451	0.0019
6	1	6	5.5	5	1	5	5.5	10947.0246	-0.0005
6	1	6	4.5	5	1	5	4.5	10950.7896	-0.0006
4	2	2	2.5	4	1	3	2.5	10951.2212	-0.0008
4	2	2	4.5	4	1	3	5.5	10952.8364	-0.0011
4	2	2	3.5	4	1	3	2.5	10957.8792	0.0005
10	1	9	8.5	10	0	10	8.5	11021.8788	0.0015

Table S2: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
10	1	9	11.5	10	0	10	11.5	11025.0025	-0.0007
10	1	9	9.5	10	0	10	9.5	11042.8676	0.0008
10	1	9	10.5	10	0	10	10.5	11045.7998	0.0001
3	2	1	4.5	3	1	2	3.5	11226.5929	0.0024
3	2	1	2.5	3	1	2	3.5	11227.4538	-0.0030
3	2	1	3.5	3	1	2	3.5	11228.2080	-0.0006
3	2	1	1.5	3	1	2	2.5	11235.4569	-0.0035
3	2	1	2.5	3	1	2	2.5	11237.0178	-0.0023
3	2	1	3.5	3	1	2	2.5	11237.7722	0.0002
3	2	1	4.5	3	1	2	4.5	11247.0578	0.0033
3	2	1	3.5	3	1	2	4.5	11248.6705	-0.0022
3	2	1	1.5	3	1	2	1.5	11255.8813	-0.0017
3	2	1	2.5	3	1	2	1.5	11257.4409	-0.0018
6	0	6	4.5	5	0	5	4.5	11327.5506	-0.0008
6	0	6	5.5	5	0	5	5.5	11329.9159	-0.0003
6	0	6	6.5	5	0	5	5.5	11330.8083	0.0000
6	0	6	5.5	5	0	5	4.5	11331.4675	-0.0001
6	0	6	7.5	5	0	5	6.5	11332.5262	0.0002
6	0	6	4.5	5	0	5	3.5	11333.1753	-0.0002
6	0	6	6.5	5	0	5	6.5	11336.4025	0.0003
2	2	0	2.5	2	1	1	2.5	11471.5511	-0.0014
2	2	0	3.5	2	1	1	2.5	11480.8654	0.0056
2	2	0	2.5	2	1	1	1.5	11484.5592	0.0008
2	2	0	2.5	2	1	1	3.5	11489.7285	-0.0029
2	2	0	1.5	2	1	1	1.5	11491.2055	-0.0009
2	2	0	3.5	2	1	1	3.5	11499.0427	0.0038
2	2	0	0.5	2	1	1	1.5	11500.5489	-0.0007
2	2	0	1.5	2	1	1	0.5	11509.3260	0.0000
2	2	0	0.5	2	1	1	0.5	11518.6701	0.0010
6	2	5	4.5	5	2	4	4.5	11522.3710	0.0005
6	2	5	5.5	5	2	4	5.5	11527.2680	-0.0001
6	2	5	7.5	5	2	4	6.5	11527.9312	0.0005
6	2	5	4.5	5	2	4	3.5	11527.9716	-0.0008
6	2	5	6.5	5	2	4	5.5	11528.7553	0.0004
6	2	5	5.5	5	2	4	4.5	11528.8274	-0.0005
6	2	5	6.5	5	2	4	6.5	11534.3422	-0.0018
6	5	2	4.5	5	5	1	3.5	11570.4646	0.0011
6	5	1	4.5	5	5	0	3.5		
6	5	2	7.5	5	5	1	6.5	11572.8609	-0.0002
6	5	1	7.5	5	5	0	6.5		
6	5	2	5.5	5	5	1	4.5	11577.7619	-0.0019
6	5	1	5.5	5	5	0	4.5		
6	4	3	4.5	5	4	2	3.5	11578.3288	0.0013

Table S2: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
6	4	2	4.5	5	4	1	3.5	11578.4272	0.0002
6	4	3	7.5	5	4	2	6.5	11579.7096	0.0006
6	4	2	7.5	5	4	1	6.5	11579.8083	-0.0006
6	5	2	6.5	5	5	1	5.5	11580.1731	-0.0010
6	5	1	6.5	5	5	0	5.5		
6	4	3	5.5	5	4	2	4.5	11583.0845	0.0016
6	4	2	5.5	5	4	1	4.5	11583.1849	0.0001
6	4	3	6.5	5	4	2	5.5	11584.4606	0.0005
6	4	2	6.5	5	4	1	5.5	11584.5619	-0.0006
6	3	4	4.5	5	3	3	4.5	11588.1356	0.0007
6	3	4	4.5	5	3	3	3.5	11589.8324	0.0010
6	3	4	7.5	5	3	3	6.5	11590.4155	0.0004
6	3	4	5.5	5	3	3	5.5	11592.1207	-0.0015
6	3	4	5.5	5	3	3	4.5	11592.6131	0.0006
6	3	4	6.5	5	3	3	5.5	11593.1870	0.0003
6	3	4	6.5	5	3	3	6.5	11594.9073	-0.0042
6	3	3	4.5	5	3	2	4.5	11596.3397	0.0011
6	3	3	4.5	5	3	2	3.5	11598.1561	0.0010
6	3	3	7.5	5	3	2	6.5	11598.7493	0.0003
6	3	3	5.5	5	3	2	5.5	11600.5449	-0.0019
6	3	3	5.5	5	3	2	4.5	11601.0735	0.0011
6	3	3	6.5	5	3	2	5.5	11601.6616	0.0005
6	3	3	6.5	5	3	2	6.5	11603.5021	-0.0044
6	2	4	4.5	5	2	3	4.5	11743.5757	0.0014
6	2	4	5.5	5	2	3	5.5	11753.2481	-0.0004
6	2	4	4.5	5	2	3	3.5	11753.5085	0.0013
6	2	4	7.5	5	2	3	6.5	11753.6614	0.0010
6	2	4	5.5	5	2	3	4.5	11756.0589	0.0005
6	2	4	6.5	5	2	3	5.5	11756.2052	0.0007
6	2	4	6.5	5	2	3	6.5	11766.1612	-0.0018
3	3	1	3.5	4	2	2	4.5	11797.7168	0.0021
3	3	1	2.5	4	2	2	3.5	11805.7755	-0.0018
3	3	1	4.5	4	2	2	5.5	11816.6608	0.0070
3	3	1	1.5	4	2	2	2.5	11824.7006	-0.0002
7	4	4	7.5	8	3	5	8.5	11856.8759	-0.0003
7	4	4	6.5	8	3	5	7.5	11857.9139	-0.0020
7	4	4	8.5	8	3	5	9.5	11863.0225	0.0040
7	4	4	5.5	8	3	5	6.5	11864.0660	-0.0020
3	3	0	3.5	4	2	3	4.5	11900.1172	0.0034
3	3	0	2.5	4	2	3	3.5	11907.1622	0.0017
3	3	0	4.5	4	2	3	5.5	11916.1967	0.0074
3	3	0	1.5	4	2	3	2.5	11923.2489	0.0020
7	4	3	7.5	8	3	6	8.5	11926.5450	-0.0022

Table S2: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
7	4	3	6.5	8	3	6	7.5	11927.4407	-0.0018
7	4	3	8.5	8	3	6	9.5	11931.8629	-0.0011
7	4	3	5.5	8	3	6	6.5	11932.7748	-0.0020
10	1	9	8.5	9	2	8	7.5	12035.4079	0.0002
10	1	9	11.5	9	2	8	10.5	12036.9964	-0.0008
2	2	1	2.5	2	1	2	3.5	12038.1899	-0.0028
2	2	1	1.5	2	1	2	0.5	12039.3515	-0.0001
2	2	1	2.5	2	1	2	1.5	12040.4652	0.0018
6	1	5	4.5	5	1	4	4.5	12043.0219	-0.0002
2	2	1	2.5	2	1	2	2.5	12046.3559	0.0000
10	1	9	9.5	9	2	8	8.5	12046.6028	0.0006
2	2	1	1.5	2	1	2	1.5	12047.5762	-0.0004
10	1	9	10.5	9	2	8	9.5	12047.9898	0.0008
2	2	1	3.5	2	1	2	3.5	12048.1434	0.0030
2	2	1	0.5	2	1	2	0.5	12049.3245	0.0009
2	2	1	1.5	2	1	2	2.5	12053.4668	-0.0023
2	2	1	3.5	2	1	2	2.5	12056.3107	0.0070
2	2	1	0.5	2	1	2	1.5	12057.5487	0.0001
6	1	5	5.5	5	1	4	5.5	12057.9518	0.0004
6	1	5	6.5	5	1	4	5.5	12062.9099	0.0008
6	1	5	7.5	5	1	4	6.5	12063.1722	0.0008
6	1	5	5.5	5	1	4	4.5	12063.9416	0.0006
6	1	5	4.5	5	1	4	3.5	12064.1996	0.0007
6	1	5	6.5	5	1	4	6.5	12084.1132	0.0005
5	1	5	5.5	4	0	4	4.5	12194.6167	0.0002
5	1	5	4.5	4	0	4	4.5	12196.0466	-0.0004
5	1	5	4.5	4	0	4	3.5	12198.5278	0.0001
5	1	5	3.5	4	0	4	4.5	12201.1209	0.0000
5	1	5	5.5	4	0	4	5.5	12201.7274	0.0005
5	1	5	4.5	4	0	4	5.5	12203.1562	-0.0011
5	1	5	3.5	4	0	4	3.5	12203.6014	-0.0003
5	1	5	6.5	4	0	4	5.5	12206.7714	0.0016
5	1	5	3.5	4	0	4	2.5	12210.7301	0.0001
3	2	2	1.5	3	1	3	1.5	12328.6202	0.0008
3	2	2	4.5	3	1	3	4.5	12331.4079	0.0019
3	2	2	2.5	3	1	3	2.5	12334.5345	-0.0007
3	2	2	3.5	3	1	3	3.5	12337.3078	0.0020
11	1	10	9.5	11	0	11	9.5	12673.3200	0.0001
11	1	10	12.5	11	0	11	12.5	12676.1475	0.0023
11	1	10	10.5	11	0	11	10.5	12694.3955	0.0011
11	1	10	11.5	11	0	11	11.5	12697.1198	0.0010
4	2	3	2.5	4	1	4	2.5	12710.1229	0.0000
4	2	3	5.5	4	1	4	5.5	12713.3199	0.0020

Table S2: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
4	2	3	3.5	4	1	4	2.5	12713.9542	0.0011
4	2	3	2.5	4	1	4	3.5	12715.3432	-0.0007
4	2	3	4.5	4	1	4	5.5	12717.1591	-0.0004
4	2	3	5.5	4	1	4	4.5	12718.5034	0.0040
4	2	3	3.5	4	1	4	3.5	12719.1737	-0.0005
4	2	3	4.5	4	1	4	3.5	12720.5139	0.0019
4	2	3	3.5	4	1	4	4.5	12721.0014	-0.0017
4	2	3	4.5	4	1	4	4.5	12722.3408	-0.0002
7	1	7	7.5	6	1	6	7.5	12743.3304	-0.0007
7	1	7	6.5	6	1	6	5.5	12748.3866	0.0004
7	1	7	7.5	6	1	6	6.5	12748.5020	0.0010
7	1	7	5.5	6	1	6	4.5	12748.6570	0.0005
7	1	7	8.5	6	1	6	7.5	12748.7761	0.0011
7	1	7	6.5	6	1	6	6.5	12749.6141	-0.0001
7	1	7	5.5	6	1	6	5.5	12753.8509	-0.0010
8	0	8	6.5	7	1	7	5.5	12970.8108	0.0006
8	0	8	9.5	7	1	7	8.5	12972.0524	-0.0004
8	0	8	8.5	7	1	7	8.5	12972.2307	-0.0015
8	0	8	6.5	7	1	7	6.5	12976.2777	0.0016
8	0	8	7.5	7	1	7	6.5	12976.5868	0.0008
8	0	8	8.5	7	1	7	7.5	12977.6765	0.0003
7	0	7	5.5	6	0	6	5.5	13130.3492	-0.0003
7	0	7	6.5	6	0	6	6.5	13131.5634	0.0003
7	0	7	7.5	6	0	6	6.5	13131.9481	0.0006
7	0	7	6.5	6	0	6	5.5	13132.4556	0.0004
7	0	7	8.5	6	0	6	7.5	13133.7828	0.0012
7	0	7	5.5	6	0	6	4.5	13134.2660	0.0003
7	0	7	7.5	6	0	6	7.5	13135.8240	0.0002
5	2	4	3.5	5	1	5	3.5	13191.6857	0.0002
5	2	4	6.5	5	1	5	6.5	13194.7214	0.0018
5	2	4	3.5	5	1	5	4.5	13196.7589	-0.0005
5	2	4	4.5	5	1	5	3.5	13197.2887	0.0014
5	2	4	6.5	5	1	5	5.5	13199.7651	0.0026
5	2	4	5.5	5	1	5	6.5	13200.3060	-0.0026
5	2	4	4.5	5	1	5	4.5	13202.3611	-0.0003
5	2	4	4.5	5	1	5	5.5	13203.7904	-0.0013
5	2	4	5.5	5	1	5	4.5	13203.9220	0.0009
5	2	4	5.5	5	1	5	5.5	13205.3525	0.0009
7	2	6	5.5	6	2	5	5.5	13425.8680	-0.0008
7	2	6	6.5	6	2	5	6.5	13431.2307	-0.0014
7	2	6	8.5	6	2	5	7.5	13432.2208	-0.0003
7	2	6	5.5	6	2	5	4.5	13432.3268	0.0007
7	2	6	7.5	6	2	5	6.5	13432.5429	0.0007

Table S2: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
7	2	6	6.5	6	2	5	5.5	13432.7183	-0.0006
7	2	6	7.5	6	2	5	7.5	13438.9537	-0.0018
7	5	3	8.5	6	5	2	7.5	13506.8614	0.0042
7	5	2	8.5	6	5	1	7.5		
7	5	3	6.5	6	5	2	5.5	13510.2866	0.0034
7	5	2	6.5	6	5	1	5.5		
7	5	3	7.5	6	5	2	6.5	13511.4678	0.0004
7	5	2	7.5	6	5	1	6.5		
7	4	4	5.5	6	4	3	4.5	13516.1945	0.0015
7	4	3	5.5	6	4	2	4.5	13516.5275	0.0022
7	4	4	8.5	6	4	3	7.5	13516.8438	0.0012
7	4	3	8.5	6	4	2	7.5	13517.1775	0.0016
7	4	4	6.5	6	4	3	5.5	13519.2346	0.0002
7	4	3	6.5	6	4	2	5.5	13519.5719	-0.0007
7	4	4	7.5	6	4	3	6.5	13519.8785	0.0006
7	4	3	7.5	6	4	2	6.5	13520.2182	0.0009
7	3	5	5.5	6	3	4	5.5	13525.9934	0.0025
7	3	5	5.5	6	3	4	4.5	13530.4702	0.0017
7	3	5	8.5	6	3	4	7.5	13530.6942	0.0011
7	3	5	6.5	6	3	4	6.5	13531.2079	0.0001
7	3	5	6.5	6	3	4	5.5	13532.2734	0.0012
7	3	5	7.5	6	3	4	6.5	13532.4900	0.0008
7	3	5	7.5	6	3	4	7.5	13536.9806	-0.0049
7	3	4	5.5	6	3	3	5.5	13544.4132	-0.0012
7	3	4	5.5	6	3	3	4.5	13549.1507	0.0026
7	3	4	8.5	6	3	3	7.5	13549.4221	0.0010
7	3	4	6.5	6	3	3	6.5	13550.0556	-0.0031
7	3	4	6.5	6	3	3	5.5	13551.1748	0.0019
7	3	4	7.5	6	3	3	6.5	13551.4372	0.0000
7	3	4	7.5	6	3	3	7.5	13556.1900	-0.0048
6	1	6	6.5	5	0	5	5.5	13641.2504	0.0005
6	1	6	5.5	5	0	5	5.5	13642.4775	-0.0004
6	1	6	5.5	5	0	5	4.5	13644.0296	0.0004
6	1	6	6.5	5	0	5	6.5	13646.8439	-0.0001
6	1	6	4.5	5	0	5	4.5	13649.2246	-0.0001
6	1	6	7.5	5	0	5	6.5	13652.0153	0.0016
6	1	6	4.5	5	0	5	3.5	13654.8494	0.0006
7	2	5	5.5	6	2	4	5.5	13769.9532	-0.0003
6	2	5	4.5	6	1	6	4.5	13773.9425	0.0009
6	2	5	7.5	6	1	6	7.5	13776.7279	0.0018
6	2	5	4.5	6	1	6	5.5	13779.1368	-0.0003
6	2	5	5.5	6	1	6	4.5	13780.3997	0.0007
7	2	5	6.5	6	2	4	6.5	13781.6540	0.0004

Table S2: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
6	2	5	7.5	6	1	6	6.5	13781.8996	0.0035
7	2	5	5.5	6	2	4	4.5	13782.4394	0.0019
7	2	5	8.5	6	2	4	7.5	13782.4750	0.0010
6	2	5	6.5	6	1	6	7.5	13783.1372	-0.0022
7	2	5	6.5	6	2	4	5.5	13784.6117	0.0022
7	2	5	7.5	6	2	4	6.5	13784.6418	0.0004
6	2	5	5.5	6	1	6	5.5	13785.5948	0.0003
6	2	5	5.5	6	1	6	6.5	13786.8223	-0.0001
6	2	5	6.5	6	1	6	5.5	13787.0824	0.0011
6	2	5	6.5	6	1	6	6.5	13788.3096	0.0003
7	2	5	7.5	6	2	4	7.5	13797.1424	-0.0015
6	4	3	5.5	7	3	4	6.5	13850.0075	-0.0003
6	4	3	7.5	7	3	4	8.5	13856.0429	0.0025
6	4	3	4.5	7	3	4	5.5	13857.6204	-0.0002
6	4	2	6.5	7	3	5	7.5	13880.2849	0.0001
6	4	2	5.5	7	3	5	6.5	13881.7531	-0.0024
6	4	2	7.5	7	3	5	8.5	13887.4076	0.0062
6	4	2	4.5	7	3	5	5.5	13888.8900	0.0021
7	1	6	5.5	6	1	5	5.5	14023.0975	-0.0002
7	1	6	6.5	6	1	5	6.5	14038.5667	-0.0002
7	1	6	7.5	6	1	5	6.5	14042.7385	0.0007
7	1	6	8.5	6	1	5	7.5	14043.2340	0.0009
7	1	6	6.5	6	1	5	5.5	14043.5253	0.0006
7	1	6	5.5	6	1	5	4.5	14044.0174	0.0008
7	2	6	5.5	7	1	7	5.5	14457.6123	0.0010
7	2	6	8.5	7	1	7	8.5	14460.1727	0.0005
7	2	6	5.5	7	1	7	6.5	14463.0788	0.0017
7	2	6	6.5	7	1	7	5.5	14464.4627	0.0014
7	2	6	8.5	7	1	7	7.5	14465.6184	0.0023
7	2	6	7.5	7	1	7	8.5	14466.9052	-0.0014
12	1	11	13.5	12	0	12	13.5	14469.1964	0.0012
7	2	6	6.5	7	1	7	6.5	14469.9259	-0.0012
7	2	6	6.5	7	1	7	7.5	14471.0374	-0.0029
7	2	6	7.5	7	1	7	6.5	14471.2395	0.0022
7	2	6	7.5	7	1	7	7.5	14472.3509	0.0004
12	1	11	11.5	12	0	12	11.5	14487.4592	0.0011
12	1	11	12.5	12	0	12	12.5	14489.9334	-0.0007
8	1	8	8.5	7	1	7	8.5	14537.7189	0.0013
8	1	8	7.5	7	1	7	6.5	14543.0917	0.0007
8	1	8	8.5	7	1	7	7.5	14543.1631	0.0015
8	1	8	6.5	7	1	7	5.5	14543.4527	0.0024
8	1	8	9.5	7	1	7	8.5	14543.5244	0.0008
8	1	8	7.5	7	1	7	7.5	14544.2053	0.0011

Table S2: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
8	1	8	6.5	7	1	7	6.5	14548.9183	0.0021
11	1	10	9.5	10	2	9	8.5	14704.7162	0.0018
11	1	10	12.5	10	2	9	11.5	14706.0107	-0.0028
11	1	10	10.5	10	2	9	9.5	14714.8734	0.0000
11	1	10	11.5	10	2	9	10.5	14716.0628	-0.0006
8	0	8	8.5	7	0	7	7.5	14904.6717	0.0003
8	0	8	6.5	7	0	7	6.5	14904.7704	0.0017
8	0	8	7.5	7	0	7	6.5	14905.0795	0.0009
8	0	8	9.5	7	0	7	8.5	14906.5345	0.0006
8	0	8	6.5	7	0	7	5.5	14906.8750	0.0005
7	1	7	7.5	6	0	6	6.5	15058.9433	0.0007
7	1	7	6.5	6	0	6	6.5	15060.0554	-0.0005
7	1	7	6.5	6	0	6	5.5	15060.9485	0.0007
7	1	7	7.5	6	0	6	7.5	15062.8185	-0.0004
7	1	7	5.5	6	0	6	5.5	15066.4132	-0.0004
7	1	7	8.5	6	0	6	7.5	15068.2643	0.0015
7	1	7	5.5	6	0	6	4.5	15070.3307	0.0009
9	0	9	9.5	8	1	8	9.5	15082.3259	-0.0007
9	0	9	7.5	8	1	8	6.5	15082.8999	-0.0005
9	0	9	10.5	8	1	8	9.5	15084.3872	0.0009
9	0	9	8.5	8	1	8	7.5	15087.8712	0.0004
9	0	9	9.5	8	1	8	8.5	15088.1321	-0.0004
9	0	9	7.5	8	1	8	7.5	15088.7269	0.0014
9	0	9	8.5	8	1	8	8.5	15088.9150	0.0015
8	2	7	6.5	8	1	8	6.5	15242.8304	-0.0002
8	2	7	9.5	8	1	8	9.5	15245.6610	0.0020
8	2	7	7.5	8	1	8	7.5	15256.1677	-0.0001
8	2	7	8.5	8	1	8	8.5	15257.7830	-0.0005
8	2	7	6.5	7	2	6	6.5	15321.8224	0.0028
8	2	7	7.5	7	2	6	7.5	15328.0197	-0.0017
8	2	7	8.5	7	2	6	7.5	15328.5953	0.0007
8	2	7	6.5	7	2	6	5.5	15328.6692	-0.0005
8	2	7	9.5	7	2	6	8.5	15329.0121	0.0017
8	2	7	7.5	7	2	6	6.5	15329.3337	0.0020
8	2	7	8.5	7	2	6	8.5	15335.3264	-0.0026
8	4	5	6.5	7	4	4	5.5	15456.2183	0.0000
8	4	5	9.5	7	4	4	8.5	15456.5424	0.0009
8	4	4	6.5	7	4	3	5.5	15457.1327	0.0008
8	4	4	9.5	7	4	3	8.5	15457.4557	-0.0015
8	4	5	7.5	7	4	4	6.5	15458.3145	0.0007
8	4	5	8.5	7	4	4	7.5	15458.6340	0.0020
8	4	4	7.5	7	4	3	6.5	15459.2419	0.0021
8	4	4	8.5	7	4	3	7.5	15459.5612	0.0009

Table S2: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
8	3	6	6.5	7	3	5	5.5	15472.6377	0.0014
8	3	6	9.5	7	3	5	8.5	15472.7137	0.0004
8	3	6	7.5	7	3	5	6.5	15473.8898	0.0041
8	3	6	8.5	7	3	5	7.5	15473.9527	-0.0023
8	3	5	6.5	7	3	4	5.5	15509.7466	0.0009
8	3	5	9.5	7	3	4	8.5	15509.8656	0.0011
8	3	5	7.5	7	3	4	6.5	15511.3274	0.0013
8	3	5	8.5	7	3	4	7.5	15511.4414	0.0006
2	2	1	2.5	1	1	0	1.5	15511.6893	-0.0005
2	2	1	1.5	1	1	0	1.5	15518.8005	-0.0025
2	2	1	2.5	1	1	0	2.5	15519.8723	-0.0028
2	2	1	1.5	1	1	0	2.5	15526.9830	-0.0053
2	2	1	0.5	1	1	0	1.5	15528.7732	-0.0018
2	2	1	3.5	1	1	0	2.5	15529.8262	0.0033
2	2	1	1.5	1	1	0	0.5	15533.5885	0.0014
2	2	1	0.5	1	1	0	0.5	15543.5588	-0.0002
2	2	0	1.5	1	1	1	0.5	15701.6087	0.0026
2	2	0	2.5	1	1	1	2.5	15709.5076	-0.0020
2	2	0	0.5	1	1	1	0.5	15710.9500	0.0007
2	2	0	1.5	1	1	1	2.5	15716.1532	-0.0044
2	2	0	3.5	1	1	1	2.5	15718.8199	0.0030
2	2	0	2.5	1	1	1	1.5	15727.6655	0.0024
2	2	0	1.5	1	1	1	1.5	15734.3108	-0.0004
2	2	0	0.5	1	1	1	1.5	15743.6541	-0.0003
8	2	6	6.5	7	2	5	6.5	15816.6553	-0.0005
8	2	6	7.5	7	2	5	7.5	15830.2081	0.0019
8	2	6	9.5	7	2	5	8.5	15831.2904	0.0012
8	2	6	6.5	7	2	5	5.5	15831.3096	-0.0022
8	2	6	8.5	7	2	5	7.5	15833.1691	0.0008
8	2	6	7.5	7	2	5	6.5	15833.1939	-0.0001
8	2	6	8.5	7	2	5	8.5	15847.8376	-0.0006
8	1	7	6.5	7	1	6	6.5	15987.2099	0.0003
8	1	7	7.5	7	1	6	7.5	16002.7772	-0.0007
8	1	7	8.5	7	1	6	7.5	16006.3034	0.0006
8	1	7	7.5	7	1	6	6.5	16006.9510	0.0024
8	1	7	9.5	7	1	6	8.5	16006.9969	-0.0004
8	1	7	6.5	7	1	6	5.5	16007.6370	0.0005
8	1	7	8.5	7	1	6	8.5	16026.7484	-0.0002
9	2	8	7.5	9	1	9	7.5	16128.8010	0.0019
9	2	8	10.5	9	1	9	10.5	16130.7847	0.0018
9	2	8	8.5	9	1	9	8.5	16141.6338	0.0007
9	2	8	9.5	9	1	9	9.5	16143.8082	0.0002
9	1	9	9.5	8	1	8	9.5	16323.9377	-0.0029

Table S2: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
9	1	9	8.5	8	1	8	7.5	16329.7006	0.0012
9	1	9	9.5	8	1	8	8.5	16329.7459	-0.0005
9	1	9	7.5	8	1	8	6.5	16330.1130	0.0008
9	1	9	10.5	8	1	8	9.5	16330.1601	-0.0009
8	1	8	8.5	7	0	7	7.5	16470.1587	0.0020
8	1	8	7.5	7	0	7	7.5	16471.1987	-0.0007
8	1	8	7.5	7	0	7	6.5	16471.5845	0.0008
8	1	8	8.5	7	0	7	8.5	16472.2018	0.0030
8	1	8	9.5	7	0	7	8.5	16478.0062	0.0016
8	1	8	6.5	7	0	7	5.5	16479.5167	0.0021
9	0	9	9.5	8	0	8	8.5	16653.6184	0.0004
9	0	9	8.5	8	0	8	7.5	16654.3758	-0.0001
9	0	9	7.5	8	0	8	6.5	16655.5410	0.0005
9	0	9	10.5	8	0	8	9.5	16655.8579	0.0008
10	2	9	8.5	10	1	10	8.5	17113.5540	0.0013
10	2	9	11.5	10	1	10	11.5	17115.4034	0.0016
10	2	9	9.5	10	1	10	9.5	17126.6170	-0.0006
10	2	9	10.5	10	1	10	10.5	17128.5561	-0.0002
10	0	10	8.5	9	1	9	7.5	17142.3301	0.0005
10	0	10	11.5	9	1	9	10.5	17142.7766	-0.0003
10	0	10	9.5	9	1	9	8.5	17145.3687	0.0001
10	0	10	10.5	9	1	9	9.5	17145.9975	0.0001
10	0	10	8.5	9	1	9	8.5	17148.5678	0.0001
9	2	8	8.5	8	2	7	7.5	17215.1649	0.0001
9	2	8	10.5	8	2	7	9.5	17215.2851	0.0002
9	2	8	9.5	8	2	7	8.5	17215.7712	0.0003
9	2	8	7.5	8	2	7	6.5	17216.0812	0.0004
3	2	2	3.5	2	1	1	2.5	17251.1445	0.0023
3	2	2	2.5	2	1	1	1.5	17264.1428	-0.0020
3	2	2	4.5	2	1	1	3.5	17269.3065	0.0023
11	3	8	11.5	11	2	9	11.5	17276.9087	-0.0008
11	3	8	10.5	11	2	9	10.5	17277.9754	-0.0011
3	2	2	1.5	2	1	1	0.5	17282.2844	0.0001
11	3	8	12.5	11	2	9	12.5	17285.0023	0.0016
11	3	8	9.5	11	2	9	9.5	17286.0668	0.0009
12	1	11	10.5	11	2	10	9.5	17367.5521	-0.0020
12	1	11	13.5	11	2	10	12.5	17368.6306	-0.0002
12	1	11	11.5	11	2	10	10.5	17376.6525	-0.0017
12	1	11	12.5	11	2	10	11.5	17377.6318	-0.0035
9	4	6	7.5	8	4	5	6.5	17399.0250	0.0021
9	4	6	10.5	8	4	5	9.5	17399.1883	0.0011
9	4	6	8.5	8	4	5	7.5	17400.5565	0.0003
9	4	6	9.5	8	4	5	8.5	17400.7162	-0.0003

Table S2: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
9	4	5	7.5	8	4	4	6.5	17401.2110	0.0002
9	4	5	10.5	8	4	4	9.5	17401.3783	-0.0007
9	4	5	8.5	8	4	4	7.5	17402.7669	-0.0006
9	4	5	9.5	8	4	4	8.5	17402.9320	0.0003
9	3	7	10.5	8	3	6	9.5	17415.6422	-0.0028
9	3	7	7.5	8	3	6	6.5	17415.6576	0.0044
9	3	7	9.5	8	3	6	8.5	17416.5413	0.0001
9	3	7	8.5	8	3	6	7.5	17416.5561	0.0015
9	3	6	7.5	8	3	5	6.5	17482.9202	-0.0008
9	3	6	10.5	8	3	5	9.5	17482.9816	0.0012
9	3	6	8.5	8	3	5	7.5	17484.2896	0.0015
9	3	6	9.5	8	3	5	8.5	17484.3441	-0.0005
10	3	7	10.5	10	2	8	10.5	17823.0075	-0.0017
10	3	7	9.5	10	2	8	9.5	17824.2234	-0.0016
10	3	7	11.5	10	2	8	11.5	17831.4251	0.0010
10	3	7	8.5	10	2	8	8.5	17832.6382	-0.0004
3	2	1	1.5	2	1	2	0.5	17851.3831	0.0013
3	2	1	4.5	2	1	2	3.5	17858.0320	0.0026
3	2	1	2.5	2	1	2	3.5	17858.8924	-0.0034
3	2	1	1.5	2	1	2	1.5	17859.6063	-0.0006
3	2	1	3.5	2	1	2	3.5	17859.6471	-0.0006
3	2	1	2.5	2	1	2	1.5	17861.1654	-0.0011
3	2	1	1.5	2	1	2	2.5	17865.4979	-0.0014
3	2	1	2.5	2	1	2	2.5	17867.0572	-0.0018
3	2	1	3.5	2	1	2	2.5	17867.8112	0.0004
9	2	7	10.5	8	2	6	9.5	17893.6984	-0.0002
9	2	7	7.5	8	2	6	6.5	17893.7629	0.0010
9	1	9	9.5	8	0	8	8.5	17895.2328	0.0009
9	2	7	9.5	8	2	6	8.5	17895.2849	-0.0013
9	2	7	8.5	8	2	6	7.5	17895.3527	0.0010
9	1	9	8.5	8	0	8	7.5	17896.2047	0.0003
9	1	9	10.5	8	0	8	9.5	17901.6329	0.0012
9	1	9	7.5	8	0	8	6.5	17902.7527	0.0003
9	1	8	9.5	8	1	7	8.5	17949.9071	0.0004
9	1	8	8.5	8	1	7	7.5	17950.4175	0.0003
9	1	8	10.5	8	1	7	9.5	17950.7910	0.0006
9	1	8	7.5	8	1	7	6.5	17951.2998	0.0001
10	1	10	9.5	9	1	9	8.5	18108.4901	-0.0001
10	1	10	10.5	9	1	9	9.5	18108.5289	0.0003
10	1	10	8.5	9	1	9	7.5	18108.9330	-0.0006
10	1	10	11.5	9	1	9	10.5	18108.9722	0.0002
11	2	10	9.5	11	1	11	9.5	18193.8157	0.0015
11	2	10	12.5	11	1	11	12.5	18195.5303	0.0014

Table S2: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
11	2	10	10.5	11	1	11	10.5	18206.9748	-0.0009
11	2	10	11.5	11	1	11	11.5	18208.7504	-0.0008
9	3	6	9.5	9	2	7	9.5	18312.5750	-0.0003
9	3	6	8.5	9	2	7	8.5	18313.9216	-0.0007
9	3	6	10.5	9	2	7	10.5	18320.9982	0.0004
9	3	6	7.5	9	2	7	7.5	18322.3435	-0.0006
10	0	10	9.5	9	0	9	8.5	18387.1972	0.0002
10	0	10	10.5	9	0	9	9.5	18387.6111	-0.0002
10	0	10	11.5	9	0	9	10.5	18388.5519	0.0003
10	0	10	8.5	9	0	9	7.5	18389.5414	-0.0001
8	3	5	8.5	8	2	6	8.5	18723.5168	-0.0001
8	3	5	7.5	8	2	6	7.5	18724.9843	-0.0016
8	3	5	9.5	8	2	6	9.5	18731.7175	0.0016
8	3	5	6.5	8	2	6	6.5	18733.1853	0.0003
4	2	3	2.5	3	1	2	3.5	18891.6504	-0.0030
4	2	3	3.5	3	1	2	3.5	18895.4817	-0.0021
4	2	3	4.5	3	1	2	3.5	18896.8210	-0.0006
4	2	3	2.5	3	1	2	2.5	18901.2158	-0.0009
4	2	3	3.5	3	1	2	2.5	18905.0463	-0.0008
4	2	3	5.5	3	1	2	4.5	18913.4463	0.0021
4	2	3	4.5	3	1	2	4.5	18917.2846	-0.0011
4	2	3	2.5	3	1	2	1.5	18921.6390	-0.0004
10	2	9	10.5	9	2	8	9.5	19093.2768	0.0000
10	2	9	9.5	9	2	8	8.5	19093.4745	-0.0002
10	2	9	11.5	9	2	8	10.5	19093.5913	0.0004
10	2	9	8.5	9	2	8	7.5	19093.6860	-0.0011
11	0	11	9.5	10	1	10	8.5	19144.9468	-0.0005
11	0	11	12.5	10	1	10	11.5	19145.2697	-0.0004
11	0	11	10.5	10	1	10	9.5	19147.0969	0.0003
11	0	11	11.5	10	1	10	10.5	19147.5003	-0.0006
6	3	3	7.5	6	2	4	6.5	19273.6965	0.0054
6	3	3	4.5	6	2	4	5.5	19275.5549	-0.0017
6	3	3	5.5	6	2	4	6.5	19277.3316	-0.0027
6	3	3	6.5	6	2	4	6.5	19278.4481	-0.0005
6	3	3	5.5	6	2	4	5.5	19280.2889	-0.0014
6	3	3	6.5	6	2	4	5.5	19281.4052	0.0007
6	3	3	7.5	6	2	4	7.5	19286.1961	0.0025
6	3	3	4.5	6	2	4	4.5	19288.0402	-0.0004
6	3	3	6.5	6	2	4	7.5	19290.9486	-0.0025
10	4	7	8.5	9	4	6	7.5	19344.9291	-0.0026
10	4	7	11.5	9	4	6	10.5	19345.0137	-0.0001
10	4	6	8.5	9	4	5	7.5	19349.6491	-0.0029
10	4	6	11.5	9	4	5	10.5	19349.7330	0.0008

Table S2: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
10	1	10	10.5	9	0	9	9.5	19350.1429	0.0003
10	1	10	9.5	9	0	9	8.5	19350.3185	-0.0002
10	4	6	10.5	9	4	5	9.5	19350.9507	0.0009
10	3	8	11.5	9	3	7	10.5	19358.4057	-0.0005
10	3	8	8.5	9	3	7	7.5	19358.4342	-0.0010
12	2	11	10.5	12	1	12	10.5	19365.0333	0.0004
12	2	11	13.5	12	1	12	13.5	19366.6113	-0.0015
12	2	11	11.5	12	1	12	11.5	19378.2000	-0.0030
12	2	11	12.5	12	1	12	12.5	19379.8256	-0.0024
5	3	2	6.5	5	2	3	5.5	19431.1514	0.0048
5	3	2	4.5	5	2	3	5.5	19432.4627	-0.0038
5	3	2	5.5	5	2	3	5.5	19432.9912	-0.0009
5	3	2	3.5	5	2	3	4.5	19433.4586	-0.0012
5	3	2	4.5	5	2	3	4.5	19435.2750	-0.0013
5	3	2	5.5	5	2	3	4.5	19435.8021	0.0002
5	3	2	6.5	5	2	3	6.5	19441.1080	0.0029
5	3	2	5.5	5	2	3	6.5	19442.9461	-0.0044
5	3	2	3.5	5	2	3	3.5	19443.3916	-0.0012
5	3	2	4.5	5	2	3	3.5	19445.2093	0.0001
10	3	7	8.5	9	3	6	7.5	19471.8129	-0.0008
10	3	7	11.5	9	3	6	10.5	19471.8496	-0.0001
10	3	7	9.5	9	3	6	8.5	19473.0961	-0.0006
10	3	7	10.5	9	3	6	9.5	19473.1284	-0.0021
4	3	1	4.5	4	2	2	4.5	19524.1985	0.0010
4	3	1	3.5	4	2	2	4.5	19525.2202	-0.0033
4	3	1	4.5	4	2	2	3.5	19526.5463	0.0002
4	3	1	5.5	4	2	2	4.5	19527.1474	0.0074
4	3	1	3.5	4	2	2	3.5	19527.5711	-0.0008
4	3	1	2.5	4	2	2	3.5	19530.5512	-0.0021
4	3	1	4.5	4	2	2	5.5	19530.8899	-0.0018
4	3	1	5.5	4	2	2	5.5	19533.8383	0.0040
4	3	1	3.5	4	2	2	2.5	19534.2289	0.0003
4	3	1	2.5	4	2	2	2.5	19537.2101	0.0001
3	3	0	3.5	3	2	1	3.5	19568.7290	0.0022
3	3	0	3.5	3	2	1	2.5	19569.4829	0.0043
3	3	0	3.5	3	2	1	4.5	19570.3420	-0.0029
3	3	0	2.5	3	2	1	3.5	19574.4322	-0.0035
3	3	0	2.5	3	2	1	2.5	19575.1878	0.0003
3	3	0	2.5	3	2	1	1.5	19576.7473	0.0001
3	3	0	4.5	3	2	1	3.5	19580.9577	-0.0031
3	3	0	4.5	3	2	1	4.5	19582.5846	0.0057
3	3	0	1.5	3	2	1	2.5	19587.4448	0.0012
3	3	0	1.5	3	2	1	1.5	19589.0031	-0.0002

Table S2: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
3	3	1	3.5	3	2	2	3.5	19603.2413	0.0014
3	3	1	2.5	3	2	2	2.5	19608.9529	-0.0044
3	3	1	4.5	3	2	2	4.5	19615.5080	0.0061
3	3	1	1.5	3	2	2	1.5	19621.2032	-0.0009
4	3	2	4.5	4	2	3	4.5	19625.3526	0.0000
4	3	2	3.5	4	2	3	4.5	19626.3933	-0.0015
4	3	2	4.5	4	2	3	3.5	19626.6917	0.0013
4	3	2	3.5	4	2	3	3.5	19627.7314	-0.0012
4	3	2	4.5	4	2	3	5.5	19629.1911	-0.0030
4	3	2	2.5	4	2	3	3.5	19630.7581	-0.0009
4	3	2	3.5	4	2	3	2.5	19631.5637	0.0007
4	3	2	5.5	4	2	3	5.5	19632.1858	0.0037
4	3	2	2.5	4	2	3	2.5	19634.5894	0.0001
5	3	3	6.5	5	2	4	5.5	19662.1748	0.0049
5	3	3	3.5	5	2	4	4.5	19663.2671	-0.0005
5	3	3	4.5	5	2	4	5.5	19663.4015	-0.0029
5	3	3	5.5	5	2	4	5.5	19663.8938	-0.0008
5	3	3	4.5	5	2	4	4.5	19664.9625	-0.0017
5	3	3	5.5	5	2	4	4.5	19665.4545	0.0001
5	3	3	6.5	5	2	4	6.5	19667.7613	0.0024
5	3	3	3.5	5	2	4	3.5	19668.8689	-0.0006
5	3	3	5.5	5	2	4	6.5	19669.4797	-0.0040
5	3	3	4.5	5	2	4	3.5	19670.5658	-0.0003
6	3	4	7.5	6	2	5	6.5	19723.8361	0.0059
6	3	4	4.5	6	2	5	5.5	19724.2708	-0.0004
6	3	4	5.5	6	2	5	6.5	19727.2572	-0.0048
6	3	4	6.5	6	2	5	6.5	19728.3259	-0.0005
6	3	4	5.5	6	2	5	5.5	19728.7475	-0.0014
6	3	4	6.5	6	2	5	5.5	19729.8154	0.0022
6	3	4	7.5	6	2	5	7.5	19730.2455	0.0021
6	3	4	4.5	6	2	5	4.5	19730.7272	-0.0013
6	3	4	6.5	6	2	5	7.5	19734.7352	-0.0044
6	3	4	5.5	6	2	5	4.5	19735.2061	-0.0001
7	3	5	6.5	7	2	6	7.5	19826.9915	-0.0006
7	3	5	7.5	7	2	6	7.5	19828.2728	-0.0006
7	3	5	6.5	7	2	6	6.5	19828.3012	-0.0011
7	3	5	8.5	7	2	6	8.5	19828.7180	0.0025
7	3	5	5.5	7	2	6	5.5	19828.8698	-0.0011
7	3	5	7.5	7	2	6	6.5	19829.5853	0.0017
10	1	9	10.5	9	1	8	9.5	19869.5759	-0.0004
10	1	9	9.5	9	1	8	8.5	19870.0238	-0.0006
10	1	9	11.5	9	1	8	10.5	19870.6474	0.0001
10	1	9	8.5	9	1	8	7.5	19871.0895	-0.0011

Table S2: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
11	1	11	10.5	10	1	10	9.5	19880.0085	-0.0028
11	1	11	11.5	10	1	10	10.5	19880.0279	0.0010
11	1	11	9.5	10	1	10	8.5	19880.4619	-0.0021
11	1	11	12.5	10	1	10	11.5	19880.4825	0.0005
10	2	8	11.5	9	2	7	10.5	19961.4235	0.0001
10	2	8	8.5	9	2	7	7.5	19961.5178	-0.0014
10	2	8	10.5	9	2	7	9.5	19962.6975	0.0009
10	2	8	9.5	9	2	7	8.5	19962.7927	-0.0012
8	3	6	9.5	8	2	7	9.5	19972.4196	0.0012
8	3	6	6.5	8	2	7	6.5	19972.8371	-0.0004
8	3	6	7.5	8	2	7	7.5	19972.8545	-0.0019
8	3	6	8.5	8	2	7	8.5	19973.6330	-0.0008
11	0	11	11.5	10	0	10	10.5	20110.0316	-0.0005
11	0	11	10.5	10	0	10	9.5	20110.2171	-0.0011
11	0	11	12.5	10	0	10	11.5	20111.4645	-0.0006
11	0	11	9.5	10	0	10	8.5	20111.5513	0.0001
4	2	2	2.5	3	1	3	1.5	20125.1215	-0.0013
4	2	2	5.5	3	1	3	4.5	20130.2555	0.0014
4	2	2	2.5	3	1	3	2.5	20131.0578	-0.0007
4	2	2	4.5	3	1	3	4.5	20136.9469	-0.0013
4	2	2	3.5	3	1	3	2.5	20137.7137	-0.0015
4	2	2	3.5	3	1	3	3.5	20140.4809	-0.0015
4	2	2	4.5	3	1	3	3.5	20142.8304	-0.0006
9	3	7	7.5	9	2	8	7.5	20172.4095	-0.0003
9	3	7	10.5	9	2	8	10.5	20172.7792	0.0008
9	3	7	8.5	9	2	8	8.5	20174.2450	-0.0011
9	3	7	9.5	9	2	8	9.5	20174.4034	-0.0007
10	3	8	8.5	10	2	9	8.5	20437.1567	-0.0011
10	3	8	11.5	10	2	9	11.5	20437.5945	0.0007
10	3	8	9.5	10	2	9	9.5	20439.8682	-0.0008
10	3	8	10.5	10	2	9	10.5	20440.1846	-0.0010
5	2	4	4.5	4	1	3	4.5	20446.3474	-0.0020
5	2	4	5.5	4	1	3	4.5	20447.9088	-0.0005
5	2	4	3.5	4	1	3	3.5	20448.1677	-0.0023
5	2	4	4.5	4	1	3	3.5	20453.7709	-0.0009
5	2	4	6.5	4	1	3	5.5	20463.4596	0.0021
5	2	4	5.5	4	1	3	5.5	20469.0458	-0.0007
5	2	4	3.5	4	1	3	2.5	20469.2745	-0.0001
11	3	9	9.5	11	2	10	9.5	20776.0533	-0.0010
11	3	9	12.5	11	2	10	12.5	20776.5635	0.0001
11	3	9	10.5	11	2	10	10.5	20779.6055	-0.0023
11	3	9	11.5	11	2	10	11.5	20780.0076	-0.0018
11	1	11	11.5	10	0	10	10.5	20842.5570	-0.0011

Table S2: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
11	1	11	10.5	10	0	10	9.5	20843.1325	-0.0006
11	1	11	12.5	10	0	10	11.5	20846.6775	0.0005
11	1	11	9.5	10	0	10	8.5	20847.0672	-0.0006

Table S3: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-H^{13}C^{13}CH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
3	2	2	4.5	2	2	1	3.5	5531.8397	-0.0013
3	2	2	2.5	2	2	1	1.5	5534.6917	0.0009
3	2	2	3.5	2	2	1	2.5	5541.8108	0.0000
3	2	1	1.5	2	2	0	0.5	5547.1850	0.0041
3	2	1	4.5	2	2	0	3.5	5554.5312	0.0004
3	2	1	2.5	2	2	0	1.5	5558.0181	0.0011
3	2	1	3.5	2	2	0	2.5	5565.3947	0.0013
1	1	1	1.5	0	0	0	1.5	5665.1354	-0.0028
1	1	1	2.5	0	0	0	1.5	5683.2977	0.0022
1	1	1	0.5	0	0	0	1.5	5697.8475	-0.0034
3	1	2	4.5	2	1	1	3.5	5789.9739	0.0000
3	1	2	3.5	2	1	1	2.5	5792.2758	-0.0001
3	1	2	1.5	2	1	1	0.5	5793.3901	-0.0012
3	1	2	2.5	2	1	1	1.5	5795.7109	-0.0011
5	0	5	3.5	4	1	4	2.5	5978.5763	0.0004
5	0	5	6.5	4	1	4	5.5	5982.0972	0.0003
5	0	5	3.5	4	1	4	3.5	5983.7618	0.0005
5	0	5	5.5	4	1	4	5.5	5988.0079	0.0002
5	0	5	4.5	4	1	4	3.5	5989.7050	0.0010
5	0	5	4.5	4	1	4	4.5	5991.5194	-0.0009
5	0	5	5.5	4	1	4	4.5	5993.1527	0.0008
6	1	5	4.5	6	0	6	4.5	6038.1368	-0.0002
6	1	5	7.5	6	0	6	7.5	6042.0717	-0.0020
6	1	5	5.5	6	0	6	5.5	6054.8459	-0.0035
6	1	5	6.5	6	0	6	6.5	6058.8430	-0.0029
4	1	4	4.5	3	1	3	4.5	7015.5826	-0.0017
4	1	4	2.5	3	1	3	1.5	7019.7708	0.0002
4	1	4	3.5	3	1	3	2.5	7020.5059	-0.0004
4	1	4	5.5	3	1	3	4.5	7020.7280	-0.0006
4	1	4	4.5	3	1	3	3.5	7021.4496	-0.0007
4	1	4	3.5	3	1	3	3.5	7023.2656	-0.0011
4	1	4	2.5	3	1	3	2.5	7025.6899	-0.0017
4	0	4	2.5	3	0	3	3.5	7311.2217	-0.0022
4	0	4	2.5	3	0	3	2.5	7315.1658	-0.0016
4	0	4	3.5	3	0	3	3.5	7318.5641	-0.0014
4	0	4	4.5	3	0	3	3.5	7321.1201	-0.0003
4	0	4	5.5	3	0	3	4.5	7322.2838	-0.0002
4	0	4	3.5	3	0	3	2.5	7322.5091	0.0003
4	0	4	2.5	3	0	3	1.5	7323.6702	-0.0007
4	0	4	3.5	3	0	3	4.5	7327.0511	-0.0021
4	0	4	4.5	3	0	3	4.5	7329.6073	-0.0008
2	1	2	2.5	1	0	1	1.5	7337.0186	-0.0014
2	1	2	1.5	1	0	1	1.5	7342.9113	-0.0023

Table S3: Observed Transition Frequencies (in MHz) for (*Z*)-$CH^{35}ClCHF\text{-}H^{13}C^{13}CH$

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
2	1	2	2.5	1	0	1	2.5	7346.9889	-0.0003
2	1	2	0.5	1	0	1	1.5	7351.1353	-0.0038
2	1	2	1.5	1	0	1	2.5	7352.8804	-0.0025
2	1	2	3.5	1	0	1	2.5	7355.1536	0.0031
2	1	2	1.5	1	0	1	0.5	7360.8422	-0.0017
2	1	2	0.5	1	0	1	0.5	7369.0676	-0.0018
4	2	3	2.5	3	2	2	1.5	7372.2155	0.0009
4	2	3	5.5	3	2	2	4.5	7373.5795	0.0000
4	2	3	3.5	3	2	2	2.5	7376.0781	0.0004
4	2	3	4.5	3	2	2	3.5	7377.4174	0.0004
4	3	2	2.5	3	3	1	1.5	7383.0360	0.0049
4	3	1	2.5	3	3	0	1.5	7383.7293	0.0003
4	3	2	5.5	3	3	1	4.5	7387.6840	0.0016
4	3	1	5.5	3	3	0	4.5	7388.3903	0.0007
4	3	2	3.5	3	3	1	2.5	7392.2565	0.0019
4	3	1	3.5	3	3	0	2.5	7392.9821	0.0003
4	3	2	4.5	3	3	1	3.5	7396.9220	-0.0011
4	3	1	4.5	3	3	0	3.5	7397.6593	-0.0006
4	2	2	2.5	3	2	1	2.5	7427.3797	0.0019
4	2	2	2.5	3	2	1	1.5	7428.8188	0.0009
4	2	2	5.5	3	2	1	4.5	7430.4308	-0.0003
4	2	2	3.5	3	2	1	3.5	7433.1449	-0.0020
4	2	2	3.5	3	2	1	2.5	7433.8385	0.0006
4	2	2	4.5	3	2	1	3.5	7435.4269	0.0005
4	2	2	4.5	3	2	1	4.5	7436.9264	-0.0035
4	1	3	2.5	3	1	2	2.5	7695.7856	-0.0011
4	1	3	3.5	3	1	2	3.5	7707.3639	0.0005
4	1	3	5.5	3	1	2	4.5	7714.1043	0.0004
4	1	3	4.5	3	1	2	3.5	7714.8035	0.0007
4	1	3	2.5	3	1	2	1.5	7716.2300	0.0007
4	1	3	3.5	3	1	2	2.5	7716.9377	0.0004
4	1	3	4.5	3	1	2	4.5	7735.2875	-0.0010
6	0	6	4.5	5	1	5	3.5	8087.7362	0.0012
6	0	6	7.5	5	1	5	6.5	8090.2095	0.0006
6	0	6	4.5	5	1	5	4.5	8092.7464	-0.0024
6	0	6	6.5	5	1	5	6.5	8094.5086	0.0022
6	0	6	5.5	5	1	5	4.5	8097.0839	0.0012
6	0	6	5.5	5	1	5	5.5	8098.4964	0.0003
6	0	6	6.5	5	1	5	5.5	8099.4881	0.0002
5	1	5	5.5	4	1	4	5.5	8760.9086	-0.0005
5	1	5	3.5	4	1	4	2.5	8765.4781	-0.0008
5	1	5	4.5	4	1	4	3.5	8765.6499	-0.0006
5	1	5	6.5	4	1	4	5.5	8765.8901	-0.0005

Table S3: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-H^{13}C^{13}CH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
5	1	5	5.5	4	1	4	4.5	8766.0531	-0.0003
5	1	5	4.5	4	1	4	4.5	8767.4649	-0.0019
5	1	5	3.5	4	1	4	3.5	8770.6621	-0.0022
3	1	3	3.5	2	0	2	2.5	8926.6891	-0.0004
3	1	3	2.5	2	0	2	2.5	8929.4481	-0.0019
3	1	3	1.5	2	0	2	2.5	8935.3693	-0.0017
3	1	3	2.5	2	0	2	1.5	8936.1181	-0.0011
3	1	3	2.5	2	0	2	3.5	8938.8209	-0.0023
3	1	3	4.5	2	0	2	3.5	8941.9322	0.0034
3	1	3	1.5	2	0	2	1.5	8942.0394	-0.0008
3	1	3	1.5	2	0	2	0.5	8951.4350	-0.0012
5	0	5	3.5	4	0	4	3.5	9104.5609	-0.0019
5	0	5	4.5	4	0	4	4.5	9107.9493	-0.0013
5	0	5	5.5	4	0	4	4.5	9109.5818	-0.0004
5	0	5	4.5	4	0	4	3.5	9110.5048	-0.0007
5	0	5	6.5	4	0	4	5.5	9110.9954	-0.0002
5	0	5	3.5	4	0	4	2.5	9111.9036	-0.0008
5	0	5	5.5	4	0	4	5.5	9116.9053	-0.0011
5	2	4	3.5	4	2	3	3.5	9206.4767	-0.0002
5	2	4	3.5	4	2	3	2.5	9210.3190	0.0005
5	2	4	6.5	4	2	3	5.5	9210.5681	-0.0002
5	2	4	4.5	4	2	3	4.5	9210.7639	-0.0002
5	2	4	4.5	4	2	3	3.5	9212.1080	0.0003
5	2	4	5.5	4	2	3	4.5	9212.3347	-0.0002
5	2	4	5.5	4	2	3	5.5	9216.1863	-0.0042
5	3	3	3.5	4	3	2	2.5	9239.4784	0.0007
5	3	3	6.5	4	3	2	5.5	9241.0191	-0.0001
5	3	2	3.5	4	3	1	2.5	9241.9468	0.0009
5	3	2	6.5	4	3	1	5.5	9243.5031	-0.0001
5	3	3	4.5	4	3	2	3.5	9244.1883	0.0008
5	3	3	5.5	4	3	2	4.5	9245.7188	0.0002
5	3	2	4.5	4	3	1	3.5	9246.7210	0.0011
5	3	2	5.5	4	3	1	4.5	9248.2675	0.0003
5	2	3	3.5	4	2	2	3.5	9316.5094	-0.0010
5	2	3	3.5	4	2	2	2.5	9322.9709	0.0004
5	2	3	6.5	4	2	2	5.5	9323.4341	0.0000
5	2	3	4.5	4	2	2	4.5	9323.8829	-0.0005
5	2	3	4.5	4	2	2	3.5	9326.1634	0.0005
5	2	3	5.5	4	2	2	4.5	9326.6143	0.0003
5	2	3	5.5	4	2	2	5.5	9333.1101	-0.0027
5	1	4	3.5	4	1	3	3.5	9611.6406	-0.0012
5	1	4	4.5	4	1	3	4.5	9625.4598	-0.0008
5	1	4	6.5	4	1	3	5.5	9631.3727	0.0005

Table S3: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-H^{13}C^{13}CH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
5	1	4	5.5	4	1	3	4.5	9631.4741	0.0004
5	1	4	3.5	4	1	3	2.5	9632.7927	0.0003
5	1	4	4.5	4	1	3	3.5	9632.9002	0.0003
5	1	4	5.5	4	1	3	5.5	9652.6574	-0.0008
9	2	7	9.5	9	1	8	9.5	9825.0411	0.0001
9	2	7	8.5	9	1	8	8.5	9825.2848	-0.0003
9	2	7	10.5	9	1	8	10.5	9826.5647	0.0011
9	2	7	7.5	9	1	8	7.5	9826.8047	0.0002
8	2	6	8.5	8	1	7	8.5	9919.4627	-0.0007
8	2	6	7.5	8	1	7	7.5	9920.1742	-0.0017
8	2	6	9.5	8	1	7	9.5	9923.3775	-0.0001
8	2	6	6.5	8	1	7	6.5	9924.0830	-0.0002
7	2	5	7.5	7	1	6	7.5	10114.0192	-0.0017
7	2	5	6.5	7	1	6	6.5	10115.3267	-0.0015
7	2	5	8.5	7	1	6	8.5	10120.4057	0.0001
7	2	5	5.5	7	1	6	5.5	10121.7061	-0.0012
7	0	7	5.5	6	1	6	4.5	10193.3328	0.0012
7	0	7	8.5	6	1	6	7.5	10195.1122	0.0004
7	0	7	7.5	6	1	6	7.5	10197.6678	0.0003
7	0	7	5.5	6	1	6	5.5	10198.4400	-0.0003
7	0	7	6.5	6	1	6	5.5	10201.0521	0.0013
7	0	7	6.5	6	1	6	6.5	10202.2603	0.0021
7	0	7	7.5	6	1	6	6.5	10202.7502	0.0006
6	2	4	7.5	6	1	5	6.5	10365.7455	0.0026
6	2	4	4.5	6	1	5	5.5	10367.8784	-0.0012
6	2	4	5.5	6	1	5	6.5	10375.0138	-0.0011
6	2	4	6.5	6	1	5	6.5	10377.8840	-0.0014
6	2	4	5.5	6	1	5	5.5	10380.0012	-0.0020
6	2	4	6.5	6	1	5	5.5	10382.8744	0.0007
6	2	4	7.5	6	1	5	7.5	10386.8130	0.0005
6	2	4	4.5	6	1	5	4.5	10388.9247	-0.0012
6	2	4	6.5	6	1	5	7.5	10398.9542	-0.0009
6	2	4	5.5	6	1	5	4.5	10401.0499	0.0004
4	1	4	4.5	3	0	3	3.5	10437.5512	0.0005
4	1	4	3.5	3	0	3	3.5	10439.3663	-0.0007
4	1	4	3.5	3	0	3	2.5	10443.3097	-0.0007
4	1	4	2.5	3	0	3	3.5	10444.5544	0.0020
4	1	4	4.5	3	0	3	4.5	10446.0398	0.0014
4	1	4	3.5	3	0	3	4.5	10447.8545	-0.0002
4	1	4	2.5	3	0	3	2.5	10448.4962	0.0004
4	1	4	5.5	3	0	3	4.5	10451.1858	0.0032
4	1	4	2.5	3	0	3	1.5	10456.9993	-0.0001
6	1	6	6.5	5	1	5	6.5	10499.7576	-0.0015

Table S3: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-H^{13}C^{13}CH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
6	1	6	5.5	5	1	5	4.5	10504.5339	-0.0008
6	1	6	4.5	5	1	5	3.5	10504.6281	-0.0015
6	1	6	6.5	5	1	5	5.5	10504.7401	-0.0005
6	1	6	7.5	5	1	5	6.5	10504.8410	-0.0002
6	1	6	5.5	5	1	5	5.5	10505.9468	-0.0013
6	1	6	4.5	5	1	5	4.5	10509.6411	-0.0023
5	2	3	6.5	5	1	4	5.5	10668.7090	0.0028
5	2	3	3.5	5	1	4	4.5	10672.0137	-0.0013
5	2	3	4.5	5	1	4	5.5	10675.6537	-0.0006
5	2	3	5.5	5	1	4	5.5	10678.3848	-0.0002
5	2	3	4.5	5	1	4	4.5	10681.6659	-0.0015
5	2	3	5.5	5	1	4	4.5	10684.3985	0.0005
5	2	3	6.5	5	1	4	6.5	10689.9941	0.0020
5	2	3	3.5	5	1	4	3.5	10693.2726	-0.0005
5	2	3	5.5	5	1	4	6.5	10699.6706	-0.0003
5	2	3	4.5	5	1	4	3.5	10702.9261	0.0005
6	0	6	4.5	5	0	5	4.5	10868.6931	-0.0022
6	0	6	5.5	5	0	5	5.5	10871.3964	-0.0012
6	0	6	6.5	5	0	5	5.5	10872.3892	-0.0003
6	0	6	5.5	5	0	5	4.5	10873.0288	-0.0004
6	0	6	7.5	5	0	5	6.5	10874.0022	-0.0006
6	0	6	4.5	5	0	5	3.5	10874.6374	-0.0006
6	0	6	6.5	5	0	5	6.5	10878.2995	-0.0008
4	2	2	5.5	4	1	3	4.5	10976.7496	0.0038
4	2	2	3.5	4	1	3	4.5	10980.9652	0.0001
4	2	2	2.5	4	1	3	3.5	10981.9431	-0.0013
4	2	2	4.5	4	1	3	4.5	10983.2452	0.0006
4	2	2	3.5	4	1	3	3.5	10988.4042	-0.0003
4	2	2	4.5	4	1	3	3.5	10990.6859	0.0020
4	2	2	5.5	4	1	3	5.5	10997.9339	0.0036
4	2	2	2.5	4	1	3	2.5	11003.0952	0.0001
4	2	2	4.5	4	1	3	5.5	11004.4302	0.0011
4	2	2	3.5	4	1	3	2.5	11009.5573	0.0021
6	2	5	4.5	5	2	4	4.5	11036.7591	0.0009
6	2	5	5.5	5	2	4	5.5	11041.6928	-0.0008
6	2	5	7.5	5	2	4	6.5	11042.3491	0.0001
6	2	5	4.5	5	2	4	3.5	11042.3879	-0.0011
6	2	5	6.5	5	2	4	5.5	11043.1979	-0.0004
6	2	5	5.5	5	2	4	4.5	11043.2638	-0.0006
6	2	5	6.5	5	2	4	6.5	11048.8182	-0.0022
6	3	4	4.5	5	3	3	3.5	11095.4727	0.0011
6	3	4	7.5	5	3	3	6.5	11096.0553	0.0001
6	3	4	5.5	5	3	3	4.5	11098.2428	0.0006

Table S3: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-H^{13}C^{13}CH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
6	3	4	6.5	5	3	3	5.5	11098.8161	0.0001
6	3	3	4.5	5	3	2	3.5	11102.0728	0.0007
6	3	3	7.5	5	3	2	6.5	11102.6843	0.0001
6	3	3	5.5	5	3	2	4.5	11104.9600	0.0005
6	3	3	6.5	5	3	2	5.5	11105.5614	0.0003
6	2	4	4.5	5	2	3	4.5	11226.9353	0.0010
6	2	4	5.5	5	2	3	5.5	11236.3268	-0.0006
6	2	4	4.5	5	2	3	3.5	11236.5876	0.0008
6	2	4	7.5	5	2	3	6.5	11236.7346	0.0005
6	2	4	5.5	5	2	3	4.5	11239.0583	0.0004
6	2	4	6.5	5	2	3	5.5	11239.1982	0.0003
6	2	4	6.5	5	2	3	6.5	11248.8747	-0.0019
3	2	1	4.5	3	1	2	3.5	11261.1219	0.0044
3	2	1	2.5	3	1	2	3.5	11261.9291	-0.0010
3	2	1	3.5	3	1	2	3.5	11262.6217	0.0007
3	2	1	1.5	3	1	2	2.5	11270.0614	-0.0025
3	2	1	2.5	3	1	2	2.5	11271.5019	-0.0021
3	2	1	3.5	3	1	2	2.5	11272.1953	0.0004
3	2	1	4.5	3	1	2	4.5	11281.6084	0.0054
3	2	1	3.5	3	1	2	4.5	11283.1094	0.0027
3	2	1	1.5	3	1	2	1.5	11290.5050	-0.0015
3	2	1	2.5	3	1	2	1.5	11291.9470	0.0004
2	2	0	2.5	2	1	1	2.5	11489.5023	-0.0013
2	2	0	1.5	2	1	1	2.5	11496.1853	-0.0037
2	2	0	3.5	2	1	1	2.5	11498.8672	0.0046
2	2	0	2.5	2	1	1	1.5	11502.5125	-0.0010
2	2	0	2.5	2	1	1	3.5	11507.6897	0.0026
2	2	0	1.5	2	1	1	1.5	11509.1962	-0.0028
2	2	0	3.5	2	1	1	3.5	11517.0548	0.0086
2	2	0	0.5	2	1	1	1.5	11518.5914	-0.0036
6	1	5	4.5	5	1	4	4.5	11519.6761	0.0002
2	2	0	1.5	2	1	1	0.5	11527.3181	-0.0028
6	1	5	5.5	5	1	4	5.5	11534.7089	-0.0002
2	2	0	0.5	2	1	1	0.5	11536.7147	-0.0021
6	1	5	6.5	5	1	4	5.5	11539.6976	0.0002
6	1	5	7.5	5	1	4	6.5	11539.9141	0.0004
6	1	5	5.5	5	1	4	4.5	11540.7226	0.0004
6	1	5	4.5	5	1	4	3.5	11540.9343	0.0003
6	1	5	6.5	5	1	4	6.5	11560.9826	-0.0008
5	1	5	5.5	4	0	4	4.5	11882.4845	0.0008
5	1	5	4.5	4	0	4	4.5	11883.8982	0.0011
5	1	5	4.5	4	0	4	3.5	11886.4522	0.0002
5	1	5	5.5	4	0	4	5.5	11889.8098	0.0019

Table S3: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-H^{13}C^{13}CH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
5	1	5	3.5	4	0	4	3.5	11891.4671	0.0013
5	1	5	6.5	4	0	4	5.5	11894.7920	0.0026
5	1	5	3.5	4	0	4	2.5	11898.8077	0.0004
2	2	1	2.5	2	1	2	3.5	12015.1713	-0.0037
2	2	1	1.5	2	1	2	0.5	12016.3318	-0.0011
2	2	1	2.5	2	1	2	1.5	12017.4429	0.0003
2	2	1	2.5	2	1	2	2.5	12023.3354	-0.0009
2	2	1	1.5	2	1	2	1.5	12024.5568	-0.0016
2	2	1	3.5	2	1	2	3.5	12025.1294	0.0027
2	2	1	0.5	2	1	2	0.5	12026.3106	0.0003
2	2	1	1.5	2	1	2	2.5	12030.4484	-0.0036
2	2	1	3.5	2	1	2	2.5	12033.2955	0.0074
2	2	1	0.5	2	1	2	1.5	12034.5347	-0.0010
7	1	7	6.5	6	1	6	5.5	12236.6089	-0.0009
7	1	7	7.5	6	1	6	6.5	12236.7283	0.0011
7	1	7	5.5	6	1	6	4.5	12236.8530	0.0000
7	1	7	8.5	6	1	6	7.5	12236.9744	0.0001
7	1	7	6.5	6	1	6	6.5	12237.8165	-0.0008
7	1	7	5.5	6	1	6	5.5	12241.9613	-0.0003
8	0	8	6.5	7	1	7	5.5	12276.1403	0.0013
8	0	8	9.5	7	1	7	8.5	12277.4439	0.0012
8	0	8	8.5	7	1	7	8.5	12278.2112	0.0011
8	0	8	6.5	7	1	7	6.5	12281.4920	0.0011
8	0	8	7.5	7	1	7	6.5	12282.3576	0.0014
8	0	8	7.5	7	1	7	7.5	12283.4489	0.0027
8	0	8	8.5	7	1	7	7.5	12283.5413	0.0019
3	2	2	1.5	3	1	3	1.5	12284.0442	0.0004
3	2	2	4.5	3	1	3	4.5	12286.8244	0.0005
3	2	2	2.5	3	1	3	2.5	12289.9423	-0.0011
3	2	2	3.5	3	1	3	3.5	12292.7093	0.0013
7	0	7	5.5	6	0	6	5.5	12605.8927	0.0004
7	0	7	6.5	6	0	6	6.5	12607.5099	-0.0011
7	0	7	7.5	6	0	6	6.5	12608.0024	0.0001
7	0	7	6.5	6	0	6	5.5	12608.5027	0.0000
7	0	7	8.5	6	0	6	7.5	12609.7443	0.0002
7	0	7	5.5	6	0	6	4.5	12610.2260	-0.0003
7	0	7	7.5	6	0	6	7.5	12612.2983	-0.0015
4	2	3	2.5	4	1	4	2.5	12636.4872	-0.0006
4	2	3	5.5	4	1	4	5.5	12639.6748	0.0000
4	2	3	3.5	4	1	4	2.5	12640.3306	0.0012
4	2	3	2.5	4	1	4	3.5	12641.6725	-0.0007
4	2	3	4.5	4	1	4	5.5	12643.5282	-0.0022
4	2	3	5.5	4	1	4	4.5	12644.8231	0.0040

Table S3: Observed Transition Frequencies (in MHz) for (*Z*)-$CH^{35}ClCHF\text{-}H^{13}C^{13}CH$

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
4	2	3	3.5	4	1	4	3.5	12645.5138	-0.0011
4	2	3	4.5	4	1	4	3.5	12646.8590	0.0007
4	2	3	3.5	4	1	4	4.5	12647.3296	-0.0016
4	2	3	4.5	4	1	4	4.5	12648.6732	-0.0015
7	2	6	5.5	6	2	5	5.5	12861.7495	0.0011
7	2	6	6.5	6	2	5	6.5	12867.1561	0.0000
7	2	6	8.5	6	2	5	7.5	12868.1424	0.0000
7	2	6	5.5	6	2	5	4.5	12868.2547	0.0003
7	2	6	7.5	6	2	5	6.5	12868.5006	-0.0002
7	2	6	6.5	6	2	5	5.5	12868.6608	0.0001
7	3	5	5.5	6	3	4	4.5	12952.7967	0.0009
7	3	5	8.5	6	3	4	7.5	12953.0210	0.0003
7	3	5	6.5	6	3	4	5.5	12954.5933	0.0012
7	3	5	7.5	6	3	4	6.5	12954.8098	0.0003
7	3	4	5.5	6	3	3	4.5	12967.6248	0.0014
7	3	4	8.5	6	3	3	7.5	12967.8696	0.0005
7	3	4	6.5	6	3	3	5.5	12969.6097	0.0002
7	3	4	7.5	6	3	3	6.5	12969.8515	0.0001
5	2	4	3.5	5	1	5	3.5	13081.3280	0.0005
5	2	4	6.5	5	1	5	6.5	13084.3530	0.0005
5	2	4	3.5	5	1	5	4.5	13086.3402	-0.0011
5	2	4	4.5	5	1	5	3.5	13086.9602	0.0020
5	2	4	6.5	5	1	5	5.5	13089.3382	0.0041
5	2	4	5.5	5	1	5	6.5	13089.9746	-0.0001
5	2	4	4.5	5	1	5	4.5	13091.9707	-0.0013
5	2	4	4.5	5	1	5	5.5	13093.3839	-0.0015
5	2	4	5.5	5	1	5	4.5	13093.5436	0.0009
5	2	4	5.5	5	1	5	5.5	13094.9551	-0.0011
7	2	5	6.5	6	2	4	6.5	13170.2207	0.0001
7	2	5	5.5	6	2	4	4.5	13170.9834	0.0023
7	2	5	8.5	6	2	4	7.5	13171.0166	-0.0002
7	2	5	6.5	6	2	4	5.5	13173.0934	0.0022
7	2	5	7.5	6	2	4	6.5	13173.1219	-0.0004
7	2	5	7.5	6	2	4	7.5	13185.2632	-0.0016
6	1	6	6.5	5	0	5	5.5	13277.6427	0.0006
6	1	6	5.5	5	0	5	4.5	13280.4816	0.0004
6	1	6	6.5	5	0	5	6.5	13283.5558	0.0029
6	1	6	4.5	5	0	5	4.5	13285.5916	0.0017
6	1	6	7.5	5	0	5	6.5	13288.6370	0.0020
6	1	6	4.5	5	0	5	3.5	13291.5337	0.0011
7	1	6	5.5	6	1	5	5.5	13417.1539	0.0006
7	1	6	6.5	6	1	5	6.5	13432.7786	0.0007
7	1	6	7.5	6	1	5	6.5	13436.9871	0.0003

Table S3: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-H^{13}C^{13}CH

J'	K_a'	K_c'	*F'*	*J''*	K_a''	K_c''	*F''*	Observed	Obs - Calc
7	1	6	8.5	6	1	5	7.5	13437.4243	0.0006
7	1	6	6.5	6	1	5	5.5	13437.7664	0.0002
7	1	6	5.5	6	1	5	4.5	13438.2000	0.0004
7	1	6	7.5	6	1	5	7.5	13458.0554	-0.0011
6	2	5	4.5	6	1	6	4.5	13619.0873	0.0005
6	2	5	7.5	6	1	6	7.5	13621.8607	0.0005
6	2	5	5.5	6	1	6	5.5	13630.7008	-0.0009
6	2	5	6.5	6	1	6	6.5	13633.4123	-0.0015
8	1	8	8.5	7	1	7	8.5	13956.2689	-0.0033
8	1	8	7.5	7	1	7	6.5	13961.5298	0.0008
8	1	8	8.5	7	1	7	7.5	13961.6010	-0.0004
8	1	8	6.5	7	1	7	5.5	13961.8625	0.0005
8	1	8	9.5	7	1	7	8.5	13961.9370	-0.0002
8	1	8	7.5	7	1	7	7.5	13962.6185	-0.0005
8	1	8	6.5	7	1	7	6.5	13967.2120	-0.0019
7	2	6	5.5	7	1	7	5.5	14250.4902	0.0019
7	2	6	8.5	7	1	7	8.5	14253.0300	0.0015
7	2	6	6.5	7	1	7	6.5	14262.7545	0.0019
7	2	6	7.5	7	1	7	7.5	14265.1864	-0.0009
8	0	8	6.5	7	0	7	6.5	14317.0468	-0.0031
8	0	8	8.5	7	0	7	7.5	14317.5175	0.0006
8	0	8	9.5	7	0	7	8.5	14319.3057	0.0004
8	0	8	6.5	7	0	7	5.5	14319.6603	0.0000
8	0	8	8.5	7	0	7	8.5	14320.0692	-0.0034
9	0	9	7.5	8	1	8	6.5	14320.8484	0.0013
9	0	9	10.5	8	1	8	9.5	14321.9015	0.0013
9	0	9	9.5	8	1	8	8.5	14326.5265	0.0009
7	1	7	7.5	6	0	6	6.5	14641.9805	0.0006
7	1	7	6.5	6	0	6	6.5	14643.0696	-0.0004
7	1	7	6.5	6	0	6	5.5	14644.0618	0.0001
7	1	7	7.5	6	0	6	7.5	14646.2791	0.0018
7	1	7	5.5	6	0	6	5.5	14649.4143	0.0006
7	1	7	8.5	6	0	6	7.5	14651.6084	0.0018
7	1	7	5.5	6	0	6	4.5	14653.7483	0.0007
8	2	7	9.5	7	2	6	8.5	14687.1503	0.0005
8	2	7	8.5	7	2	6	7.5		
8	2	7	6.5	7	2	6	5.5	14687.2060	-0.0013
8	2	7	7.5	7	2	6	6.5	14687.4137	-0.0003
8	3	6	6.5	7	3	5	5.5	14811.5848	0.0004
8	3	6	9.5	7	3	5	8.5	14811.6591	0.0003
8	3	6	8.5	7	3	5	7.5	14812.8977	-0.0005
8	3	5	6.5	7	3	4	5.5	14841.0822	0.0010
8	3	5	9.5	7	3	4	8.5	14841.1957	0.0005

Table S3: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-H^{13}C^{13}CH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
8	3	5	7.5	7	3	4	6.5	14842.6127	0.0004
8	3	5	8.5	7	3	4	7.5	14842.7223	0.0005
8	2	7	6.5	8	1	8	6.5	14975.8355	0.0019
8	2	7	9.5	8	1	8	9.5	14978.2417	0.0011
8	2	7	7.5	8	1	8	7.5	14988.6390	0.0015
8	2	7	8.5	8	1	8	8.5	14990.7364	0.0002
8	2	6	9.5	7	2	5	8.5	15124.1831	0.0007
8	2	6	8.5	7	2	5	7.5	15126.0318	0.0009
8	2	6	7.5	7	2	5	6.5	15126.0502	-0.0015
8	1	7	6.5	7	1	6	6.5	15301.2106	-0.0005
8	1	7	7.5	7	1	6	7.5	15316.9935	-0.0015
8	1	7	8.5	7	1	6	7.5	15320.5890	0.0005
8	1	7	7.5	7	1	6	6.5	15321.2008	-0.0031
8	1	7	9.5	7	1	6	8.5	15321.2132	0.0028
8	1	7	6.5	7	1	6	5.5	15321.8238	-0.0002
8	1	7	8.5	7	1	6	8.5	15341.2190	-0.0022
2	2	1	2.5	1	1	0	1.5	15353.3348	0.0002
2	2	1	1.5	1	1	0	1.5	15360.4484	-0.0019
2	2	1	2.5	1	1	0	2.5	15361.5177	-0.0011
2	2	1	1.5	1	1	0	2.5	15368.6302	-0.0043
2	2	1	0.5	1	1	0	1.5	15370.4233	-0.0044
2	2	1	3.5	1	1	0	2.5	15371.4759	0.0053
2	2	1	1.5	1	1	0	0.5	15375.2362	0.0017
2	2	1	0.5	1	1	0	0.5	15385.2115	-0.0004
2	2	0	1.5	1	1	1	0.5	15528.2933	0.0023
2	2	0	2.5	1	1	1	2.5	15536.1581	-0.0029
2	2	0	0.5	1	1	1	0.5	15537.6874	0.0004
2	2	0	1.5	1	1	1	2.5	15542.8395	-0.0069
2	2	0	3.5	1	1	1	2.5	15545.5222	0.0021
2	2	0	2.5	1	1	1	1.5	15554.3233	0.0051
2	2	0	1.5	1	1	1	1.5	15561.0059	0.0022
2	2	0	0.5	1	1	1	1.5	15570.4019	0.0022
9	1	9	8.5	8	1	8	7.5	15679.2000	-0.0057
9	1	9	9.5	8	1	8	8.5	15679.2606	0.0069
9	1	9	7.5	8	1	8	6.5	15679.5903	-0.0039
9	1	9	10.5	8	1	8	9.5	15679.6493	0.0052
9	2	8	7.5	9	1	9	7.5	15794.6857	-0.0025
9	2	8	10.5	9	1	9	10.5	15796.5852	0.0014
9	2	8	8.5	9	1	9	8.5	15807.3924	-0.0050
9	2	8	9.5	9	1	9	9.5	15809.6746	0.0024
8	1	8	8.5	7	0	7	7.5	15995.5794	0.0004
8	1	8	7.5	7	0	7	7.5	15996.5957	-0.0009
8	1	8	7.5	7	0	7	6.5	15997.0885	0.0005

Table S3: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-H^{13}C^{13}CH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
8	1	8	8.5	7	0	7	8.5	15998.1318	-0.0028
8	1	8	6.5	7	0	7	6.5	16002.7695	-0.0034
8	1	8	9.5	7	0	7	8.5	16003.8006	0.0010
9	0	9	9.5	8	0	8	8.5	16004.5881	0.0004
9	0	9	8.5	8	0	8	7.5	16004.9654	-0.0003
8	1	8	6.5	7	0	7	5.5	16005.3826	-0.0007
9	0	9	10.5	8	0	8	9.5	16006.3948	0.0002
9	0	9	7.5	8	0	8	6.5	16006.5699	-0.0002
10	0	10	8.5	9	1	9	7.5	16318.3843	0.0012
10	0	10	11.5	9	1	9	10.5	16318.7865	0.0006
10	0	10	9.5	9	1	9	8.5	16321.7571	0.0011
10	0	10	10.5	9	1	9	9.5	16322.5290	0.0010
9	2	8	8.5	8	2	7	7.5	16497.9647	-0.0007
9	2	8	10.5	8	2	7	9.5	16497.9866	-0.0006
9	2	8	9.5	8	2	7	8.5	16498.1889	-0.0008
9	2	8	7.5	8	2	7	6.5	16498.4487	-0.0001
9	3	7	10.5	8	3	6	9.5	16671.3437	-0.0023
9	3	7	7.5	8	3	6	6.5	16671.3599	0.0047
9	3	7	9.5	8	3	6	8.5	16672.2460	0.0010
9	3	6	7.5	8	3	5	6.5	16724.9278	0.0013
9	3	6	10.5	8	3	5	9.5	16724.9797	-0.0002
9	3	6	8.5	8	3	5	7.5	16726.2342	0.0020
9	3	6	9.5	8	3	5	8.5	16726.2807	-0.0017
3	2	2	3.5	2	1	1	2.5	17025.1214	0.0010
3	2	2	2.5	2	1	1	1.5	17038.1231	-0.0030
3	2	2	4.5	2	1	1	3.5	17043.2920	0.0062
3	2	2	1.5	2	1	1	0.5	17056.2681	-0.0013
9	2	7	10.5	8	2	6	9.5	17091.4069	0.0015
9	2	7	7.5	8	2	6	6.5	17091.4569	-0.0018
9	2	7	9.5	8	2	6	8.5	17093.0034	0.0019
9	2	7	8.5	8	2	6	7.5	17093.0576	0.0007
9	1	8	9.5	8	1	7	8.5	17187.4233	-0.0007
9	1	8	8.5	8	1	7	7.5	17187.9470	-0.0007
9	1	8	10.5	8	1	7	9.5	17188.2194	0.0000
9	1	8	7.5	8	1	7	6.5	17188.7366	-0.0008
9	1	9	9.5	8	0	8	8.5	17357.3155	-0.0002
9	1	9	8.5	8	0	8	7.5	17358.3780	-0.0004
9	1	9	10.5	8	0	8	9.5	17364.1394	0.0009
9	1	9	7.5	8	0	8	6.5	17365.3170	-0.0003
10	1	10	9.5	9	1	9	8.5	17389.8028	-0.0002
10	1	10	10.5	9	1	9	9.5	17389.8389	0.0006
10	1	10	8.5	9	1	9	7.5	17390.2232	-0.0010
10	1	10	11.5	9	1	9	10.5	17390.2619	0.0014

Table S3: Observed Transition Frequencies (in MHz) for (*Z*)-$CH^{35}ClCHF\text{-}H^{13}C^{13}CH$

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
3	2	1	1.5	2	1	2	0.5	17578.6731	-0.0005
3	2	1	4.5	2	1	2	3.5	17585.2592	0.0004
3	2	1	3.5	2	1	2	3.5	17586.7593	-0.0031
3	2	1	1.5	2	1	2	1.5	17586.8996	0.0006
3	2	1	2.5	2	1	2	1.5	17588.3382	-0.0009
3	2	1	2.5	2	1	2	2.5	17594.2315	-0.0013
3	2	1	3.5	2	1	2	2.5	17594.9229	-0.0009
10	0	10	9.5	9	0	9	8.5	17675.1691	0.0004
10	0	10	10.5	9	0	9	9.5	17675.2547	-0.0014
10	0	10	11.5	9	0	9	10.5	17676.5299	0.0002
10	0	10	8.5	9	0	9	7.5	17677.1300	-0.0002
11	0	11	9.5	10	1	10	8.5	18263.8984	-0.0006
11	0	11	12.5	10	1	10	11.5	18264.2564	-0.0005
11	0	11	10.5	10	1	10	9.5	18266.4197	0.0004
11	0	11	11.5	10	1	10	10.5	18266.8898	0.0001
4	2	3	3.5	3	1	2	3.5	18608.9165	-0.0014
4	2	3	4.5	3	1	2	3.5	18610.2623	0.0010
4	2	3	2.5	3	1	2	2.5	18614.6489	-0.0012
4	2	3	3.5	3	1	2	2.5	18618.4906	-0.0011
4	2	3	5.5	3	1	2	4.5	18626.8972	0.0057
4	2	3	4.5	3	1	2	4.5	18630.7515	0.0045
4	2	3	2.5	3	1	2	1.5	18635.0934	0.0006
10	1	10	10.5	9	0	9	9.5	18742.5663	0.0000
10	1	10	9.5	9	0	9	8.5	18743.2149	-0.0008
10	1	10	11.5	9	0	9	10.5	18748.0048	0.0004
10	1	10	8.5	9	0	9	7.5	18748.9707	-0.0007
8	3	5	8.5	8	2	6	8.5	18833.3447	-0.0016
8	3	5	9.5	8	2	6	9.5	18841.2802	0.0024
10	1	9	10.5	9	1	8	9.5	19034.1418	-0.0021
10	1	9	9.5	9	1	8	8.5	19034.5792	-0.0024
10	1	9	11.5	9	1	8	10.5	19035.1087	-0.0024
10	1	9	8.5	9	1	8	7.5	19035.5427	-0.0022
6	3	3	6.5	6	2	4	6.5	19319.9251	-0.0014
6	3	3	5.5	6	2	4	5.5	19321.6865	-0.0020
6	3	3	7.5	6	2	4	7.5	19327.4145	0.0017
6	3	3	4.5	6	2	4	4.5	19329.1743	-0.0014
5	3	2	5.5	5	2	3	5.5	19453.5623	-0.0009
5	3	2	3.5	5	2	3	3.5	19463.6889	-0.0014
4	3	1	4.5	4	2	2	4.5	19531.9094	-0.0007
4	3	1	3.5	4	2	2	3.5	19535.2279	-0.0020
4	3	1	5.5	4	2	2	5.5	19541.3959	0.0025
4	3	1	2.5	4	2	2	2.5	19544.7131	-0.0018
3	3	0	3.5	3	2	1	3.5	19569.6753	-0.0012

Table S3: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-H^{13}C^{13}CH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
3	3	0	2.5	3	2	1	2.5	19576.0845	-0.0014
3	3	0	4.5	3	2	1	4.5	19583.4363	0.0014
3	3	1	3.5	3	2	2	3.5	19599.3329	0.0057
3	3	1	2.5	3	2	2	2.5	19605.0502	-0.0041
3	3	1	4.5	3	2	2	4.5	19611.6153	0.0059
4	3	2	4.5	4	2	3	4.5	19618.8330	-0.0003
4	3	2	3.5	4	2	3	3.5	19621.2304	-0.0007
4	3	2	5.5	4	2	3	5.5	19625.7148	0.0025
4	3	2	2.5	4	2	3	2.5	19628.1380	0.0019
5	3	3	5.5	5	2	4	5.5	19652.2167	-0.0003
5	3	3	4.5	5	2	4	4.5	19653.3090	-0.0020
5	3	3	6.5	5	2	4	6.5	19656.1653	0.0022
5	3	3	3.5	5	2	4	3.5	19657.2945	-0.0007
6	3	4	6.5	6	2	5	6.5	19707.8336	-0.0011
6	3	4	5.5	6	2	5	5.5	19708.2881	-0.0007
6	3	4	7.5	6	2	5	7.5	19709.8697	0.0003
6	3	4	4.5	6	2	5	4.5	19710.3769	-0.0010
4	2	2	2.5	3	1	3	1.5	19740.4902	0.0002
4	2	2	5.5	3	1	3	4.5	19745.5463	0.0001
4	2	2	2.5	3	1	3	2.5	19746.4117	0.0006
4	2	2	4.5	3	1	3	4.5	19752.0404	-0.0046
4	2	2	3.5	3	1	3	2.5	19752.8713	0.0002
4	2	2	3.5	3	1	3	3.5	19755.6329	0.0013
4	2	2	4.5	3	1	3	3.5	19757.9098	-0.0012
7	3	5	7.5	7	2	6	7.5	19794.1438	0.0004
7	3	5	6.5	7	2	6	6.5	19794.2176	-0.0027
7	3	5	8.5	7	2	6	8.5	19794.7486	0.0010
7	3	5	5.5	7	2	6	5.5	19794.9174	-0.0019
5	2	4	5.5	4	1	3	4.5	20107.7933	-0.0001
5	2	4	4.5	4	1	3	3.5	20113.6605	-0.0015
5	2	4	6.5	4	1	3	5.5	20123.3580	0.0022
5	2	4	3.5	4	1	3	2.5	20129.1822	0.0001

Table S4: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{37}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
1	1	1	1.5	0	0	0	1.5	5595.2964	-0.0015
1	1	1	2.5	0	0	0	1.5	5609.6101	0.0012
1	1	1	0.5	0	0	0	1.5	5621.0740	-0.0016
3	0	3	3.5	2	0	2	2.5	5732.4454	0.0011
3	0	3	4.5	2	0	2	3.5	5733.2439	-0.0002
3	0	3	2.5	2	0	2	1.5	5734.6258	0.0014
3	0	3	1.5	2	0	2	0.5	5735.4292	0.0014
3	2	2	1.5	2	2	1	0.5	5754.7076	-0.0010
3	2	2	4.5	2	2	1	3.5	5760.3100	-0.0008
3	2	2	2.5	2	2	1	1.5	5762.5559	0.0002
3	2	2	3.5	2	2	1	2.5	5768.1648	-0.0008
3	2	1	1.5	2	2	0	0.5	5783.3904	0.0034
3	2	1	4.5	2	2	0	3.5	5789.2205	-0.0012
3	2	1	2.5	2	2	0	1.5	5792.0315	0.0013
3	2	1	3.5	2	2	0	2.5	5797.8794	0.0008
3	1	2	1.5	2	1	1	1.5	6033.3007	0.0011
3	1	2	2.5	2	1	1	2.5	6039.1430	-0.0020
3	1	2	4.5	2	1	1	3.5	6044.8837	-0.0004
3	1	2	3.5	2	1	1	2.5	6046.6748	-0.0002
3	1	2	1.5	2	1	1	0.5	6047.5892	0.0000
3	1	2	2.5	2	1	1	1.5	6049.3917	0.0001
6	1	5	4.5	6	0	6	4.5	6171.3511	-0.0003
6	1	5	7.5	6	0	6	7.5	6174.5530	0.0000
6	1	5	5.5	6	0	6	5.5	6184.9427	-0.0006
6	1	5	6.5	6	0	6	6.5	6188.1861	-0.0005
5	0	5	3.5	4	1	4	2.5	6543.2882	-0.0001
5	0	5	6.5	4	1	4	5.5	6545.9521	-0.0005
5	0	5	3.5	4	1	4	3.5	6547.4187	-0.0025
5	0	5	5.5	4	1	4	5.5	6550.1601	-0.0016
5	0	5	4.5	4	1	4	3.5	6551.6504	0.0002
5	0	5	4.5	4	1	4	4.5	6553.0988	0.0006
5	0	5	5.5	4	1	4	4.5	6554.2700	0.0000
7	1	6	5.5	7	0	7	5.5	7115.0970	-0.0018
7	1	6	8.5	7	0	7	8.5	7118.0591	-0.0020
7	1	6	6.5	7	0	7	6.5	7129.7426	-0.0014
7	1	6	7.5	7	0	7	7.5	7132.7643	-0.0008
8	1	7	6.5	7	2	6	5.5	7190.4873	0.0027
8	1	7	9.5	7	2	6	8.5	7192.1113	0.0000
8	1	7	7.5	7	2	6	6.5	7200.5190	0.0005
8	1	7	8.5	7	2	6	7.5	7202.2571	-0.0007
4	1	4	4.5	3	1	3	4.5	7280.6210	-0.0022
4	1	4	2.5	3	1	3	1.5	7283.9874	-0.0004
4	1	4	3.5	3	1	3	2.5	7284.5365	-0.0005

Table S4: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{37}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
4	1	4	5.5	3	1	3	4.5	7284.7313	-0.0001
4	1	4	4.5	3	1	3	3.5	7285.2720	-0.0004
4	1	4	3.5	3	1	3	3.5	7286.7188	-0.0016
4	1	4	2.5	3	1	3	2.5	7288.6689	-0.0011
2	1	2	2.5	1	0	1	1.5	7324.5233	-0.0004
2	1	2	1.5	1	0	1	1.5	7329.1608	-0.0015
2	1	2	2.5	1	0	1	2.5	7332.3780	-0.0006
2	1	2	0.5	1	0	1	1.5	7335.6397	-0.0014
2	1	2	1.5	1	0	1	2.5	7337.0152	-0.0019
2	1	2	3.5	1	0	1	2.5	7338.8194	0.0008
2	1	2	1.5	1	0	1	0.5	7343.2924	-0.0001
2	1	2	0.5	1	0	1	0.5	7349.7702	-0.0011
4	0	4	2.5	3	0	3	2.5	7605.4622	-0.0012
4	0	4	3.5	3	0	3	3.5	7607.9137	-0.0011
4	0	4	4.5	3	0	3	3.5	7609.8250	-0.0004
4	0	4	5.5	3	0	3	4.5	7610.8718	-0.0004
4	0	4	3.5	3	0	3	2.5	7610.9437	-0.0015
4	0	4	2.5	3	0	3	1.5	7611.9902	-0.0006
4	0	4	4.5	3	0	3	4.5	7616.3410	-0.0012
4	2	3	2.5	3	2	2	1.5	7675.4227	-0.0003
4	2	3	5.5	3	2	2	4.5	7676.4901	-0.0005
4	2	3	3.5	3	2	2	2.5	7678.4495	0.0006
4	2	3	4.5	3	2	2	3.5	7679.4997	0.0000
4	3	2	2.5	3	3	1	1.5	7691.3793	0.0046
4	3	1	2.5	3	3	0	1.5	7692.3994	0.0007
4	3	2	5.5	3	3	1	4.5	7695.0493	-0.0007
4	3	1	5.5	3	3	0	4.5	7696.0831	-0.0007
4	3	2	3.5	3	3	1	2.5	7698.6748	0.0006
4	3	1	3.5	3	3	0	2.5	7699.7297	0.0009
4	3	2	4.5	3	3	1	3.5	7702.3600	0.0000
4	3	1	4.5	3	3	0	3.5	7703.4244	0.0000
4	2	2	2.5	3	2	1	2.5	7746.0348	-0.0033
4	2	2	2.5	3	2	1	1.5	7747.3509	0.0006
4	2	2	5.5	3	2	1	4.5	7748.6299	-0.0003
4	2	2	3.5	3	2	1	3.5	7750.7874	-0.0020
4	2	2	3.5	3	2	1	2.5	7751.4188	0.0008
4	2	2	4.5	3	2	1	3.5	7752.6853	0.0001
4	2	2	4.5	3	2	1	4.5	7754.0281	-0.0056
4	1	3	2.5	3	1	2	2.5	8037.3551	-0.0025
4	1	3	3.5	3	1	2	3.5	8046.4378	-0.0013
4	1	3	5.5	3	1	2	4.5	8051.7634	-0.0003
4	1	3	4.5	3	1	2	3.5	8052.2776	-0.0002
4	1	3	2.5	3	1	2	1.5	8053.4495	-0.0001

Table S4: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{37}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
4	1	3	3.5	3	1	2	2.5	8053.9692	-0.0001
4	1	3	4.5	3	1	2	4.5	8068.3938	-0.0020
8	1	7	6.5	8	0	8	6.5	8256.1448	0.0005
8	1	7	9.5	8	0	8	9.5	8258.8623	-0.0006
8	1	7	7.5	8	0	8	7.5	8271.6379	-0.0016
8	1	7	8.5	8	0	8	8.5	8274.4796	-0.0003
6	0	6	4.5	5	1	5	3.5	8730.5030	0.0000
6	0	6	7.5	5	1	5	6.5	8732.3307	-0.0006
6	0	6	4.5	5	1	5	4.5	8734.5361	-0.0002
6	0	6	6.5	5	1	5	6.5	8735.1207	-0.0013
6	0	6	5.5	5	1	5	4.5	8737.3548	-0.0002
6	0	6	5.5	5	1	5	5.5	8738.4905	-0.0015
6	0	6	6.5	5	1	5	5.5	8739.1358	0.0000
3	1	3	3.5	2	0	2	2.5	8962.4338	0.0009
3	1	3	2.5	2	0	2	2.5	8964.6161	-0.0001
3	1	3	1.5	2	0	2	2.5	8969.2978	-0.0007
3	1	3	3.5	2	0	2	3.5	8969.7491	-0.0003
3	1	3	2.5	2	0	2	1.5	8969.8279	0.0013
3	1	3	2.5	2	0	2	3.5	8971.9345	0.0017
3	1	3	4.5	2	0	2	3.5	8974.3993	0.0008
3	1	3	1.5	2	0	2	1.5	8974.5113	0.0024
3	1	3	1.5	2	0	2	0.5	8981.8415	0.0017
5	1	5	5.5	4	1	4	5.5	9089.2868	-0.0024
5	1	5	3.5	4	1	4	2.5	9092.9866	-0.0002
5	1	5	4.5	4	1	4	3.5	9093.0863	-0.0002
5	1	5	6.5	4	1	4	5.5	9093.3029	-0.0001
5	1	5	5.5	4	1	4	4.5	9093.3975	0.0001
5	1	5	4.5	4	1	4	4.5	9094.5332	-0.0014
5	1	5	3.5	4	1	4	3.5	9097.1181	-0.0017
5	0	5	3.5	4	0	4	3.5	9456.2140	-0.0013
5	0	5	4.5	4	0	4	4.5	9458.5333	-0.0004
5	0	5	5.5	4	0	4	4.5	9459.7051	-0.0004
5	0	5	4.5	4	0	4	3.5	9460.4438	-0.0005
5	0	5	6.5	4	0	4	5.5	9460.9660	-0.0002
5	0	5	3.5	4	0	4	2.5	9461.6969	-0.0003
5	0	5	5.5	4	0	4	5.5	9465.1746	-0.0009
9	2	7	9.5	9	1	8	9.5	9477.1530	0.0002
9	2	7	8.5	9	1	8	8.5	9477.1689	0.0029
9	2	7	10.5	9	1	8	10.5	9477.2296	-0.0021
9	2	7	7.5	9	1	8	7.5	9477.2449	0.0010
8	2	6	8.5	8	1	7	8.5	9494.5293	0.0006
8	2	6	7.5	8	1	7	7.5	9494.8997	0.0003
8	2	6	9.5	8	1	7	9.5	9496.6024	0.0009

Table S4: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{37}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
8	2	6	6.5	8	1	7	6.5	9496.9700	-0.0004
5	2	4	3.5	4	2	3	3.5	9583.8510	0.0004
5	2	4	3.5	4	2	3	2.5	9586.8650	0.0005
5	2	4	6.5	4	2	3	5.5	9587.0537	-0.0006
5	2	4	4.5	4	2	3	4.5	9587.1955	-0.0003
5	2	4	4.5	4	2	3	3.5	9588.2482	-0.0001
5	2	4	5.5	4	2	3	4.5	9588.4220	0.0005
5	2	4	5.5	4	2	3	5.5	9591.4398	-0.0013
9	1	8	7.5	9	0	9	7.5	9595.0538	-0.0030
9	1	8	10.5	9	0	9	10.5	9597.9735	-0.0005
9	1	8	8.5	9	0	9	8.5	9611.5669	-0.0006
9	1	8	9.5	9	0	9	9.5	9613.9086	-0.0021
5	3	3	3.5	4	3	2	2.5	9624.6823	0.0022
5	3	3	6.5	4	3	2	5.5	9625.8959	-0.0007
5	3	2	3.5	4	3	1	2.5	9628.2872	-0.0004
5	3	3	4.5	4	3	2	3.5	9628.4127	0.0004
5	3	2	6.5	4	3	1	5.5	9629.5211	0.0004
5	3	3	5.5	4	3	2	4.5	9629.6232	0.0010
5	3	2	4.5	4	3	1	3.5	9632.0873	0.0010
5	3	2	5.5	4	3	1	4.5	9633.3135	0.0003
7	2	5	7.5	7	1	6	7.5	9641.4077	-0.0007
7	2	5	6.5	7	1	6	6.5	9642.2599	-0.0007
7	2	5	8.5	7	1	6	8.5	9645.5718	0.0002
7	2	5	5.5	7	1	6	5.5	9646.4201	-0.0006
5	2	3	3.5	4	2	2	3.5	9723.9906	-0.0017
5	2	3	3.5	4	2	2	2.5	9729.3726	0.0004
5	2	3	6.5	4	2	2	5.5	9729.7497	-0.0005
5	2	3	4.5	4	2	2	4.5	9730.1103	-0.0021
5	2	3	4.5	4	2	2	3.5	9732.0079	-0.0003
5	2	3	5.5	4	2	2	4.5	9732.3785	-0.0001
5	2	3	5.5	4	2	2	5.5	9737.7795	-0.0026
9	1	8	7.5	8	2	7	6.5	9812.2363	0.0010
9	1	8	10.5	8	2	7	9.5	9813.8825	-0.0017
9	1	8	8.5	8	2	7	7.5	9821.8807	-0.0011
9	1	8	9.5	8	2	7	8.5	9822.9496	0.0003
6	2	4	7.5	6	1	5	6.5	9873.3219	0.0020
6	2	4	4.5	6	1	5	5.5	9874.8320	-0.0017
6	2	4	5.5	6	1	5	6.5	9881.0247	0.0023
6	2	4	6.5	6	1	5	6.5	9883.4067	-0.0007
6	2	4	5.5	6	1	5	5.5	9884.9085	-0.0011
6	2	4	6.5	6	1	5	5.5	9887.2944	-0.0002
6	2	4	7.5	6	1	5	7.5	9889.7448	0.0004
6	2	4	4.5	6	1	5	4.5	9891.2431	-0.0010

Table S4: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{37}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
6	2	4	6.5	6	1	5	7.5	9899.8318	-0.0001
6	2	4	5.5	6	1	5	4.5	9901.3199	-0.0002
5	1	4	3.5	4	1	3	3.5	10034.5377	-0.0007
5	1	4	4.5	4	1	3	4.5	10045.3435	-0.0009
5	1	4	6.5	4	1	3	5.5	10050.0202	0.0001
5	1	4	5.5	4	1	3	4.5	10050.0494	0.0000
5	1	4	3.5	4	1	3	2.5	10051.1496	-0.0006
5	1	4	4.5	4	1	3	3.5	10051.1837	0.0006
5	1	4	5.5	4	1	3	5.5	10066.6802	-0.0014
5	2	3	6.5	5	1	4	5.5	10174.5834	0.0014
5	2	3	3.5	5	1	4	4.5	10177.0361	-0.0008
5	2	3	4.5	5	1	4	5.5	10180.3462	-0.0014
5	2	3	5.5	5	1	4	5.5	10182.6136	-0.0002
5	2	3	4.5	5	1	4	4.5	10185.0516	-0.0010
5	2	3	5.5	5	1	4	4.5	10187.3191	0.0002
5	2	3	6.5	5	1	4	6.5	10191.2444	0.0009
5	2	3	3.5	5	1	4	3.5	10193.6813	-0.0003
5	2	3	5.5	5	1	4	6.5	10199.2744	-0.0010
5	2	3	4.5	5	1	4	3.5	10201.6975	0.0001
4	2	2	5.5	4	1	3	4.5	10494.8831	0.0019
4	2	2	3.5	4	1	3	4.5	10498.3870	-0.0019
4	2	2	2.5	4	1	3	3.5	10498.8457	-0.0020
4	2	2	4.5	4	1	3	4.5	10500.2844	-0.0004
4	2	2	3.5	4	1	3	3.5	10504.2270	-0.0006
4	2	2	4.5	4	1	3	3.5	10506.1239	0.0005
4	2	2	5.5	4	1	3	5.5	10511.5142	0.0009
4	1	4	4.5	3	0	3	3.5	10515.2603	-0.0006
4	2	2	2.5	4	1	3	2.5	10515.4580	-0.0014
4	1	4	3.5	3	0	3	3.5	10516.7076	-0.0014
4	2	2	4.5	4	1	3	5.5	10516.9152	-0.0016
4	1	4	3.5	3	0	3	2.5	10519.7387	-0.0006
4	2	2	3.5	4	1	3	2.5	10520.8399	-0.0008
4	1	4	2.5	3	0	3	3.5		
4	1	4	4.5	3	0	3	4.5	10521.7773	-0.0004
4	1	4	3.5	3	0	3	4.5	10523.2255	-0.0002
4	1	4	2.5	3	0	3	2.5	10523.8701	-0.0022
4	1	4	5.5	3	0	3	4.5	10525.8864	0.0006
4	1	4	2.5	3	0	3	1.5	10530.3994	-0.0003
3	2	1	4.5	3	1	2	3.5	10798.5307	0.0019
3	2	1	2.5	3	1	2	3.5	10799.2464	-0.0024
3	2	1	3.5	3	1	2	3.5	10799.8770	-0.0004
3	2	1	1.5	3	1	2	2.5	10805.4646	-0.0020
3	2	1	2.5	3	1	2	2.5	10806.7779	-0.0011

Table S4: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{37}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
3	2	1	3.5	3	1	2	2.5	10807.4080	0.0004
3	2	1	4.5	3	1	2	4.5	10814.6485	0.0017
3	2	1	3.5	3	1	2	4.5	10815.9938	-0.0016
3	2	1	2.5	3	1	2	1.5	10822.8707	-0.0002
6	1	6	6.5	5	1	5	6.5	10890.1145	0.0003
6	1	6	5.5	5	1	5	4.5	10893.9705	-0.0004
6	1	6	4.5	5	1	5	3.5	10894.0864	0.0025
6	1	6	6.5	5	1	5	5.5	10894.1278	-0.0003
6	1	6	7.5	5	1	5	6.5	10894.2440	-0.0006
6	1	6	5.5	5	1	5	5.5	10895.1071	-0.0010
6	1	6	4.5	5	1	5	4.5	10898.1187	0.0015
7	0	7	5.5	6	1	6	4.5	10903.1011	-0.0003
7	0	7	8.5	6	1	6	7.5	10904.3850	-0.0003
7	0	7	7.5	6	1	6	7.5	10905.6760	-0.0004
7	0	7	5.5	6	1	6	5.5	10907.2465	-0.0012
7	0	7	6.5	6	1	6	5.5	10908.5853	-0.0004
7	0	7	6.5	6	1	6	6.5	10909.5652	-0.0006
7	0	7	7.5	6	1	6	6.5	10909.8074	0.0007
2	2	0	2.5	2	1	1	2.5	11048.6732	-0.0007
2	2	0	1.5	2	1	1	2.5	11053.8908	-0.0029
2	2	0	3.5	2	1	1	2.5	11055.9875	0.0052
2	2	0	2.5	2	1	1	1.5	11058.9198	-0.0007
2	2	0	2.5	2	1	1	3.5	11062.9985	-0.0024
2	2	0	1.5	2	1	1	1.5	11064.1391	-0.0012
2	2	0	3.5	2	1	1	3.5	11070.3117	0.0025
2	2	0	0.5	2	1	1	1.5	11071.4697	-0.0015
2	2	0	1.5	2	1	1	0.5	11078.4295	-0.0005
2	2	0	0.5	2	1	1	0.5	11085.7617	0.0008
3	3	1	3.5	4	2	2	4.5	11113.8313	0.0033
3	3	1	2.5	4	2	2	3.5	11120.2224	-0.0026
10	1	9	8.5	10	0	10	8.5	11122.0676	0.0030
10	1	9	11.5	10	0	10	11.5	11124.5024	0.0000
3	3	1	4.5	4	2	2	5.5	11128.8831	0.0060
3	3	1	1.5	4	2	2	2.5	11135.2639	-0.0004
10	1	9	9.5	10	0	10	9.5	11138.6405	0.0007
10	1	9	10.5	10	0	10	10.5	11140.9874	0.0006
3	3	0	3.5	4	2	3	4.5	11224.6142	0.0020
3	3	0	2.5	4	2	3	3.5	11230.1590	-0.0024
3	3	0	1.5	4	2	3	2.5	11242.8248	-0.0002
6	0	6	4.5	5	0	5	4.5	11275.9731	0.0004
6	0	6	5.5	5	0	5	5.5	11277.6197	0.0002
6	0	6	6.5	5	0	5	5.5	11278.2630	-0.0003
6	0	6	5.5	5	0	5	4.5	11278.7914	0.0001

Table S4: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{37}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
6	0	6	7.5	5	0	5	6.5	11279.6820	0.0003
6	0	6	4.5	5	0	5	3.5	11280.2018	0.0002
6	0	6	6.5	5	0	5	6.5	11282.4723	-0.0003
6	2	5	4.5	5	2	4	4.5	11486.8252	0.0010
6	2	5	5.5	5	2	4	5.5	11490.6545	-0.0011
6	2	5	7.5	5	2	4	6.5	11491.1848	-0.0010
6	2	5	4.5	5	2	4	3.5	11491.2268	0.0049
6	2	5	6.5	5	2	4	5.5	11491.8212	-0.0001
6	2	5	5.5	5	2	4	4.5	11491.8818	0.0005
6	2	5	6.5	5	2	4	6.5	11496.2064	-0.0017
6	4	3	4.5	5	4	2	3.5	11546.7299	0.0022
6	4	2	4.5	5	4	1	3.5	11546.8498	-0.0001
6	4	3	7.5	5	4	2	6.5	11547.8183	0.0006
6	4	2	7.5	5	4	1	6.5	11547.9396	-0.0009
6	4	3	5.5	5	4	2	4.5	11550.4869	0.0010
6	4	2	5.5	5	4	1	4.5	11550.6103	-0.0003
6	4	3	6.5	5	4	2	5.5	11551.5744	0.0011
6	4	2	6.5	5	4	1	5.5	11551.6978	-0.0006
6	3	4	4.5	5	3	3	3.5	11558.5643	0.0015
6	3	4	7.5	5	3	3	6.5	11559.0229	0.0006
6	3	4	5.5	5	3	3	4.5	11560.7618	0.0000
6	3	4	6.5	5	3	3	5.5	11561.2156	0.0004
6	3	3	4.5	5	3	2	3.5	11568.1845	-0.0007
6	3	3	7.5	5	3	2	6.5	11568.6645	0.0004
6	3	3	5.5	5	3	2	4.5	11570.5057	0.0005
6	3	3	6.5	5	3	2	5.5	11570.9800	0.0002
2	2	1	2.5	2	1	2	3.5	11625.9482	-0.0019
2	2	1	1.5	2	1	2	0.5	11626.8804	-0.0006
2	2	1	2.5	2	1	2	1.5	11627.7520	0.0003
2	2	1	2.5	2	1	2	2.5	11632.3907	0.0005
2	2	1	1.5	2	1	2	1.5	11633.3583	-0.0015
2	2	1	3.5	2	1	2	3.5	11633.7968	0.0024
2	2	1	0.5	2	1	2	0.5	11634.7418	0.0016
2	2	1	1.5	2	1	2	2.5	11637.9964	-0.0020
2	2	1	3.5	2	1	2	2.5	11640.2396	0.0051
2	2	1	0.5	2	1	2	1.5	11641.2187	-0.0003
6	2	4	4.5	5	2	3	4.5	11727.4364	-0.0003
6	2	4	5.5	5	2	3	5.5	11735.2462	-0.0002
6	2	4	4.5	5	2	3	3.5	11735.4540	0.0014
6	2	4	7.5	5	2	3	6.5	11735.5768	0.0010
6	2	4	5.5	5	2	3	4.5	11737.5133	0.0007
6	2	4	6.5	5	2	3	5.5	11737.6319	0.0006
6	2	4	6.5	5	2	3	6.5	11745.6631	-0.0002

Table S4: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{37}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
3	2	2	1.5	3	1	3	1.5	11922.4321	0.0008
3	2	2	4.5	3	1	3	4.5	11924.6283	0.0014
3	2	2	2.5	3	1	3	2.5	11927.1011	-0.0003
3	2	2	3.5	3	1	3	3.5	11929.2880	0.0015
5	1	5	5.5	4	0	4	4.5	11998.8331	0.0002
5	1	5	4.5	4	0	4	4.5	11999.9702	0.0001
5	1	5	4.5	4	0	4	3.5	12001.8806	-0.0001
5	1	5	5.5	4	0	4	5.5	12004.3038	0.0008
5	1	5	3.5	4	0	4	3.5	12005.9136	-0.0003
5	1	5	6.5	4	0	4	5.5	12008.3176	0.0009
5	1	5	3.5	4	0	4	2.5	12011.3958	0.0001
6	1	5	4.5	5	1	4	4.5	12021.2459	0.0007
6	1	5	5.5	5	1	4	5.5	12032.9504	-0.0002
6	1	5	6.5	5	1	4	5.5	12036.8386	0.0009
6	1	5	7.5	5	1	4	6.5	12037.0753	0.0004
6	1	5	5.5	5	1	4	4.5	12037.6560	0.0002
6	1	5	4.5	5	1	4	3.5	12037.8907	0.0007
4	2	3	2.5	4	1	4	2.5	12313.8664	-0.0001
4	2	3	5.5	4	1	4	5.5	12316.3875	0.0014
4	2	3	3.5	4	1	4	2.5	12316.8816	0.0012
4	2	3	2.5	4	1	4	3.5	12317.9998	0.0003
4	2	3	4.5	4	1	4	5.5	12319.4053	-0.0004
4	2	3	5.5	4	1	4	4.5	12320.4968	0.0025
4	2	3	4.5	4	1	4	3.5	12322.0675	0.0017
4	2	3	3.5	4	1	4	4.5	12322.4612	-0.0002
4	2	3	4.5	4	1	4	4.5	12323.5137	-0.0002
10	1	9	8.5	9	2	8	7.5	12461.8500	0.0007
10	1	9	11.5	9	2	8	10.5	12463.0444	-0.0007
10	1	9	9.5	9	2	8	8.5	12470.4344	0.0006
10	1	9	10.5	9	2	8	9.5	12471.5335	0.0008
7	1	7	7.5	6	1	6	7.5	12682.5453	0.0004
7	1	7	6.5	6	1	6	5.5	12686.5870	0.0004
7	1	7	7.5	6	1	6	6.5	12686.6767	0.0014
7	1	7	5.5	6	1	6	4.5	12686.8180	0.0009
7	1	7	8.5	6	1	6	7.5	12686.9094	0.0014
7	1	7	6.5	6	1	6	6.5	12687.5678	0.0012
7	1	7	5.5	6	1	6	5.5	12690.9643	0.0010
5	2	4	3.5	5	1	5	3.5	12807.7454	0.0011
5	2	4	6.5	5	1	5	6.5	12810.1392	0.0019
5	2	4	3.5	5	1	5	4.5	12811.7772	-0.0003
5	2	4	4.5	5	1	5	3.5	12812.1395	-0.0024
5	2	4	6.5	5	1	5	5.5	12814.1543	0.0032
5	2	4	5.5	5	1	5	6.5	12814.5249	0.0008

Table S4: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{37}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
5	2	4	4.5	5	1	5	4.5	12816.1759	0.0007
5	2	4	4.5	5	1	5	5.5	12817.3118	-0.0005
5	2	4	5.5	5	1	5	4.5	12817.4025	0.0017
5	2	4	5.5	5	1	5	5.5	12818.5382	0.0002
8	0	8	6.5	7	1	7	5.5	13040.3267	0.0008
8	0	8	9.5	7	1	7	8.5	13041.2603	0.0004
8	0	8	7.5	7	1	7	6.5	13044.5990	0.0009
8	0	8	8.5	7	1	7	7.5	13045.4058	0.0009
7	0	7	5.5	6	0	6	5.5	13063.8645	0.0008
7	0	7	6.5	6	0	6	6.5	13064.5565	-0.0014
7	0	7	7.5	6	0	6	6.5	13064.7996	0.0008
7	0	7	6.5	6	0	6	5.5	13065.2016	-0.0001
7	0	7	8.5	6	0	6	7.5	13066.2998	0.0013
7	0	7	5.5	6	0	6	4.5	13066.6833	0.0010
7	0	7	7.5	6	0	6	7.5	13067.5907	0.0010
7	2	6	5.5	6	2	5	5.5	13382.8621	-0.0015
7	2	6	6.5	6	2	5	6.5	13387.0535	-0.0011
7	2	6	8.5	6	2	5	7.5	13387.8419	0.0010
7	2	6	5.5	6	2	5	4.5	13387.9200	-0.0005
7	2	6	7.5	6	2	5	6.5	13388.0715	0.0003
7	2	6	6.5	6	2	5	5.5	13388.2208	0.0005
7	2	6	7.5	6	2	5	7.5	13393.0902	-0.0033
6	2	5	4.5	6	1	6	4.5	13404.8831	0.0009
6	2	5	7.5	6	1	6	7.5	13407.0800	0.0014
6	2	5	4.5	6	1	6	5.5	13409.0288	0.0004
6	2	5	5.5	6	1	6	4.5	13409.9392	0.0000
6	2	5	7.5	6	1	6	6.5	13411.2107	0.0019
6	2	5	6.5	6	1	6	7.5	13412.1015	0.0006
6	2	5	5.5	6	1	6	5.5	13414.0852	-0.0002
6	2	5	5.5	6	1	6	6.5	13415.0635	-0.0020
6	2	5	6.5	6	1	6	5.5	13415.2522	0.0011
6	2	5	6.5	6	1	6	6.5	13416.2310	-0.0001
6	1	6	6.5	5	0	5	5.5	13433.2561	0.0006
6	1	6	5.5	5	0	5	5.5	13434.2349	-0.0006
6	1	6	5.5	5	0	5	4.5	13435.4078	0.0005
6	1	6	4.5	5	0	5	4.5	13439.5527	-0.0009
6	1	6	7.5	5	0	5	6.5	13441.5962	0.0012
6	1	6	4.5	5	0	5	3.5	13443.7835	0.0010
7	4	4	5.5	6	4	3	4.5	13479.5145	0.0005
7	4	3	5.5	6	4	2	4.5	13479.9219	-0.0001
7	4	4	8.5	6	4	3	7.5	13480.0277	0.0012
7	4	3	8.5	6	4	2	7.5	13480.4358	0.0002
7	4	4	6.5	6	4	3	5.5	13481.9211	0.0008

Table S4: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{37}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
7	4	3	6.5	6	4	2	5.5	13482.3362	0.0022
7	4	4	7.5	6	4	3	6.5	13482.4283	-0.0007
7	4	3	7.5	6	4	2	6.5	13482.8440	0.0002
7	3	5	5.5	6	3	4	4.5	13494.2487	0.0028
7	3	5	8.5	6	3	4	7.5	13494.4190	-0.0032
7	3	5	6.5	6	3	4	5.5	13495.6723	0.0003
7	3	5	7.5	6	3	4	6.5	13495.8438	0.0005
7	3	4	5.5	6	3	3	4.5	13515.8120	0.0014
7	3	4	8.5	6	3	3	7.5	13516.0211	0.0010
7	3	4	6.5	6	3	3	5.5	13517.4343	0.0014
7	3	4	7.5	6	3	3	6.5	13517.6387	0.0005
7	2	5	5.5	6	2	4	5.5	13755.5311	0.0008
7	2	5	6.5	6	2	4	6.5	13764.9689	0.0003
7	2	5	5.5	6	2	4	4.5	13765.6044	-0.0019
7	2	5	8.5	6	2	4	7.5	13765.6345	0.0005
7	2	5	6.5	6	2	4	5.5	13767.3536	0.0001
7	2	5	7.5	6	2	4	6.5	13767.3786	0.0003
7	2	5	7.5	6	2	4	7.5	13777.4634	-0.0024
7	1	6	7.5	6	1	5	6.5	14009.3780	0.0007
7	1	6	8.5	6	1	5	7.5	14009.8075	0.0008
7	1	6	6.5	6	1	5	5.5	14010.0036	0.0011
7	1	6	5.5	6	1	5	4.5	14010.4306	0.0009
7	2	6	5.5	7	1	7	5.5	14105.9858	0.0001
7	2	6	8.5	7	1	7	8.5	14108.0129	0.0015
7	2	6	6.5	7	1	7	6.5	14115.7181	-0.0010
7	2	6	7.5	7	1	7	7.5	14117.6273	0.0002
8	1	8	7.5	7	1	7	6.5	14470.6507	0.0018
8	1	8	8.5	7	1	7	7.5	14470.7037	0.0004
8	1	8	6.5	7	1	7	5.5	14470.9510	0.0022
8	1	8	9.5	7	1	7	8.5	14471.0054	0.0006
8	0	8	8.5	7	0	7	7.5	14822.2739	0.0003
8	0	8	7.5	7	0	7	6.5	14822.5994	0.0005
8	0	8	9.5	7	0	7	8.5	14823.7839	0.0012
8	0	8	6.5	7	0	7	5.5	14824.0423	0.0007
7	1	7	7.5	6	0	6	6.5	14841.6680	0.0005
7	1	7	6.5	6	0	6	6.5	14842.5588	0.0000
7	1	7	6.5	6	0	6	5.5	14843.1993	-0.0033
7	1	7	7.5	6	0	6	7.5	14844.4584	0.0002
7	1	7	5.5	6	0	6	5.5	14847.5775	-0.0019
7	1	7	8.5	6	0	6	7.5	14848.8227	0.0013
7	1	7	5.5	6	0	6	4.5	14850.3985	0.0005
8	2	7	6.5	8	1	8	6.5	14911.0263	0.0006
8	2	7	9.5	8	1	8	9.5	14912.5607	0.0020

Table S4: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{37}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
8	2	7	7.5	8	1	8	7.5	14920.6927	-0.0005
8	2	7	8.5	8	1	8	8.5	14922.8017	-0.0001
2	2	1	2.5	1	1	0	1.5	15079.9898	-0.0004
2	2	1	1.5	1	1	0	1.5	15085.5954	-0.0029
2	2	1	2.5	1	1	0	2.5	15086.4411	-0.0030
2	2	1	1.5	1	1	0	2.5	15092.0471	-0.0052
2	2	1	0.5	1	1	0	1.5	15093.4552	-0.0024
2	2	1	3.5	1	1	0	2.5	15094.2901	0.0017
2	2	1	1.5	1	1	0	0.5	15097.2472	0.0003
2	2	1	0.5	1	1	0	0.5	15105.1048	-0.0013
9	0	9	7.5	8	1	8	6.5	15128.2049	0.0008
9	0	9	10.5	8	1	8	9.5	15128.4695	0.0007
9	0	9	8.5	8	1	8	7.5	15131.0082	0.0007
9	0	9	9.5	8	1	8	8.5	15131.8413	0.0008
8	2	7	9.5	7	2	6	8.5	15275.5539	0.0020
8	2	7	8.5	7	2	6	7.5	15275.8790	0.0010
2	2	0	1.5	1	1	1	0.5	15275.9362	0.0013
8	2	7	6.5	7	2	6	5.5	15275.9912	0.0025
2	2	0	2.5	1	1	1	2.5	15282.1803	-0.0016
2	2	0	0.5	1	1	1	0.5	15283.2670	0.0012
2	2	0	1.5	1	1	1	2.5	15287.3973	-0.0045
2	2	0	3.5	1	1	1	2.5	15289.4930	0.0026
2	2	0	2.5	1	1	1	1.5	15296.4947	0.0018
2	2	0	1.5	1	1	1	1.5	15301.7125	-0.0002
2	2	0	0.5	1	1	1	1.5	15309.0427	-0.0009
8	3	6	9.5	7	3	5	8.5	15431.4674	0.0005
8	3	6	6.5	7	3	5	5.5	15431.4891	-0.0012
8	3	6	8.5	7	3	5	7.5	15432.4630	0.0001
8	3	6	7.5	7	3	5	6.5	15432.4783	0.0019
8	3	5	6.5	7	3	4	5.5	15474.2670	-0.0001
8	3	5	9.5	7	3	4	8.5	15474.3650	0.0011
8	3	5	7.5	7	3	4	6.5	15475.5478	0.0013
8	3	5	8.5	7	3	4	7.5	15475.6412	0.0006
8	2	6	9.5	7	2	5	8.5	15815.6155	0.0012
8	2	6	6.5	7	2	5	5.5	15815.6344	-0.0025
8	2	6	8.5	7	2	5	7.5	15817.1095	0.0007
8	2	6	7.5	7	2	5	6.5	15817.1315	-0.0018
9	2	8	7.5	9	1	9	7.5	15818.8840	-0.0007
9	2	8	10.5	9	1	9	10.5	15820.4786	0.0012
9	2	8	8.5	9	1	9	8.5	15829.0460	0.0002
9	2	8	9.5	9	1	9	9.5	15830.7273	0.0006
8	1	7	8.5	7	1	6	7.5	15963.9890	0.0006
8	1	7	7.5	7	1	6	6.5	15964.4949	0.0005

Table S4: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{37}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
8	1	7	9.5	7	1	6	8.5	15964.5847	0.0004
8	1	7	6.5	7	1	6	5.5	15965.0876	0.0005
9	1	9	8.5	8	1	8	7.5	16246.2231	-0.0012
9	1	9	9.5	8	1	8	8.5	16246.2612	0.0005
9	1	9	7.5	8	1	8	6.5	16246.5632	-0.0016
9	1	9	10.5	8	1	8	9.5	16246.6031	0.0009
8	1	8	8.5	7	0	7	7.5	16247.5730	0.0011
8	1	8	7.5	7	0	7	6.5	16248.6501	0.0004
8	1	8	9.5	7	0	7	8.5	16253.5290	0.0015
8	1	8	6.5	7	0	7	5.5	16254.6649	0.0005
9	0	9	8.5	8	0	8	7.5	16557.0587	0.0005
9	0	9	9.5	8	0	8	8.5	16557.1387	-0.0001
9	0	9	10.5	8	0	8	9.5	16558.2148	0.0012
9	0	9	7.5	8	0	8	6.5	16558.8265	-0.0004
3	2	2	3.5	2	1	1	2.5	16809.1351	0.0005
3	2	2	2.5	2	1	1	1.5	16819.3787	-0.0008
3	2	2	1.5	2	1	1	1.5	16819.3974	0.0058
3	2	2	4.5	2	1	1	3.5	16823.4522	0.0013
10	2	9	8.5	10	1	10	8.5	16827.0658	0.0023
10	2	9	11.5	10	1	10	11.5	16828.5958	-0.0022
3	2	2	1.5	2	1	1	0.5	16833.6815	0.0003
10	2	9	9.5	10	1	10	9.5	16837.3568	-0.0016
9	2	8	9.5	8	2	7	8.5	17154.1853	-0.0002
9	2	8	7.5	8	2	7	6.5	17154.4240	0.0002
9	2	8	10.5	8	2	7	9.5	17154.5223	0.0014
9	2	8	8.5	8	2	7	7.5	17154.5759	-0.0009
10	0	10	8.5	9	1	9	7.5	17158.6695	0.0001
10	0	10	11.5	9	1	9	10.5	17159.0199	-0.0002
10	0	10	9.5	9	1	9	8.5	17160.8396	-0.0001
10	0	10	10.5	9	1	9	9.5	17161.2714	-0.0012
9	3	7	7.5	8	3	6	6.5	17369.4296	0.0045
9	3	7	10.5	8	3	6	9.5	17369.4983	-0.0027
9	3	7	8.5	8	3	6	7.5	17370.1353	0.0020
9	3	7	9.5	8	3	6	8.5	17370.1875	-0.0028
3	2	1	1.5	2	1	2	0.5	17424.9161	0.0007
3	2	1	4.5	2	1	2	3.5	17430.1869	0.0018
3	2	1	1.5	2	1	2	1.5	17431.3970	0.0027
3	2	1	3.5	2	1	2	3.5	17431.5326	-0.0010
3	2	1	2.5	2	1	2	1.5	17432.7057	-0.0009
3	2	1	2.5	2	1	2	2.5	17437.3437	-0.0014
3	2	1	3.5	2	1	2	2.5	17437.9738	0.0001
9	3	6	10.5	8	3	5	9.5	17446.8675	-0.0022
9	3	6	8.5	8	3	5	7.5	17447.9403	0.0021

Table S4: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{37}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
9	3	6	9.5	8	3	5	8.5	17447.9867	-0.0003
9	3	6	9.5	9	2	7	9.5	17529.3002	-0.0010
9	3	6	8.5	9	2	7	8.5	17530.3789	0.0000
9	3	6	10.5	9	2	7	10.5	17536.0408	-0.0005
9	3	6	7.5	9	2	7	7.5	17537.1199	0.0014
9	1	9	9.5	8	0	8	8.5	17671.5593	0.0002
9	1	9	8.5	8	0	8	7.5	17672.2753	0.0004
9	1	9	10.5	8	0	8	9.5	17676.3490	0.0020
9	1	9	7.5	8	0	8	6.5	17677.1883	0.0008
9	2	7	10.5	8	2	6	9.5	17877.9562	0.0012
9	2	7	7.5	8	2	6	6.5	17878.0115	-0.0013
9	2	7	9.5	8	2	6	8.5	17879.1922	-0.0016
9	2	7	8.5	8	2	6	7.5	17879.2548	0.0020
9	1	8	9.5	8	1	7	8.5	17896.5693	-0.0003
9	1	8	8.5	8	1	7	7.5	17896.9868	0.0005
9	1	8	10.5	8	1	7	9.5	17897.3251	0.0002
9	1	8	7.5	8	1	7	6.5	17897.7389	-0.0004
8	3	5	8.5	8	2	6	8.5	17960.5056	-0.0023
8	3	5	7.5	8	2	6	7.5	17961.6918	-0.0017
8	3	5	9.5	8	2	6	9.5	17967.1279	0.0013
8	3	5	6.5	8	2	6	6.5	17968.3102	-0.0021
10	1	10	10.5	9	1	9	9.5	18013.7238	0.0012
10	1	10	9.5	9	1	9	8.5	18013.7746	-0.0009
10	1	10	11.5	9	1	9	10.5	18014.0844	-0.0003
10	1	10	8.5	9	1	9	7.5	18014.1227	0.0002
10	0	10	10.5	9	0	9	9.5	18275.6925	-0.0003
10	0	10	9.5	9	0	9	8.5	18276.0573	0.0008
10	0	10	8.5	9	0	9	7.5	18277.0298	-0.0002
10	0	10	11.5	9	0	9	10.5	18277.1538	0.0003
7	3	4	7.5	7	2	5	7.5	18301.9748	-0.0013
7	3	4	6.5	7	2	5	6.5	18303.2792	-0.0011
7	3	4	8.5	7	2	5	8.5	18308.3783	0.0012
7	3	4	5.5	7	2	5	5.5	18309.6821	0.0000
4	2	3	3.5	3	1	2	3.5	18440.9051	-0.0016
4	2	3	4.5	3	1	2	3.5	18441.9589	-0.0002
4	2	3	2.5	3	1	2	2.5	18445.4210	-0.0020
4	2	3	3.5	3	1	2	2.5	18448.4359	-0.0009
4	2	3	5.5	3	1	2	4.5	18455.0590	0.0015
4	2	3	4.5	3	1	2	4.5	18458.0774	0.0003
4	2	3	2.5	3	1	2	1.5	18461.5145	-0.0004
6	3	3	6.5	6	2	4	6.5	18551.7150	-0.0011
6	3	3	5.5	6	2	4	5.5	18553.1996	-0.0013
6	3	3	7.5	6	2	4	7.5	18557.9925	0.0016

Table S4: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{37}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
6	3	3	4.5	6	2	4	4.5	18559.4771	-0.0006
5	3	2	5.5	5	2	3	5.5	18718.3670	-0.0008
5	3	2	4.5	5	2	3	4.5	18720.2074	-0.0009
5	3	2	6.5	5	2	3	6.5	18724.9043	0.0018
5	3	2	3.5	5	2	3	3.5	18726.7436	-0.0015
4	3	1	4.5	4	2	2	4.5	18817.4335	0.0003
4	3	1	3.5	4	2	2	3.5	18820.1290	-0.0012
4	3	1	5.5	4	2	2	5.5	18825.1349	0.0029
4	3	1	2.5	4	2	2	2.5	18827.8306	0.0009
3	3	0	3.5	3	2	1	3.5	18866.6964	0.0024
3	3	0	2.5	3	2	1	2.5	18871.8197	0.0004
3	3	0	4.5	3	2	1	4.5	18877.6835	0.0050
3	3	0	1.5	3	2	1	1.5	18882.7815	0.0002
3	3	1	3.5	3	2	2	3.5	18903.9329	0.0018
3	3	1	2.5	3	2	2	2.5	18908.4326	-0.0014
3	3	1	1.5	3	2	2	1.5	18918.0804	-0.0009
4	3	2	3.5	4	2	3	3.5	18928.6585	-0.0009
4	3	2	5.5	4	2	3	5.5	18932.1480	0.0014
4	3	2	2.5	4	2	3	2.5	18934.0323	-0.0007
5	3	3	5.5	5	2	4	5.5	18967.9917	-0.0003
5	3	3	4.5	5	2	4	4.5	18968.8221	-0.0012
5	3	3	6.5	5	2	4	6.5	18970.9902	0.0012
5	3	3	3.5	5	2	4	3.5	18971.8472	-0.0014
10	2	9	10.5	9	2	8	9.5	19021.9511	-0.0007
10	2	9	9.5	9	2	8	8.5	19022.0867	-0.0014
10	2	9	11.5	9	2	8	10.5	19022.2043	-0.0011
10	2	9	8.5	9	2	8	7.5	19022.3005	-0.0009
6	3	4	6.5	6	2	5	6.5	19037.3857	-0.0003
6	3	4	5.5	6	2	5	5.5	19037.7031	-0.0007
6	3	4	7.5	6	2	5	7.5	19038.8264	0.0009
6	3	4	4.5	6	2	5	4.5	19039.1879	-0.0015
10	1	10	10.5	9	0	9	9.5	19128.1429	0.0001
10	1	10	9.5	9	0	9	8.5	19128.9889	-0.0033
10	1	10	11.5	9	0	9	10.5	19132.2189	0.0008
11	0	11	9.5	10	1	10	8.5	19132.3809	0.0002
10	1	10	8.5	9	0	9	7.5	19132.4830	-0.0002
11	0	11	12.5	10	1	10	11.5	19132.6854	-0.0011
11	0	11	10.5	10	1	10	9.5	19133.8467	-0.0006
11	0	11	11.5	10	1	10	10.5	19134.2105	-0.0005
7	3	5	7.5	7	2	6	7.5	19145.1564	-0.0004
7	3	5	6.5	7	2	6	6.5		
7	3	5	8.5	7	2	6	8.5	19145.4075	0.0007
7	3	5	5.5	7	2	6	5.5	19145.5139	-0.0010

Table S4: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{37}ClCHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
8	3	6	6.5	8	2	7	6.5	19301.0146	-0.0019
8	3	6	9.5	8	2	7	9.5	19301.3226	0.0009
8	3	6	8.5	8	2	7	8.5	19301.7406	-0.0023
8	3	6	7.5	8	2	7	7.5	19302.0076	-0.0015
9	3	7	7.5	9	2	8	7.5	19516.0186	0.0009
9	3	7	10.5	9	2	8	10.5	19516.3027	0.0009
9	3	7	8.5	9	2	8	8.5	19517.5648	-0.0007
9	3	7	9.5	9	2	8	9.5	19517.7477	0.0002
4	2	2	2.5	3	1	3	1.5	19705.2488	0.0005
4	2	2	5.5	3	1	3	4.5	19709.3385	0.0015
4	2	2	2.5	3	1	3	2.5	19709.9304	-0.0002
4	2	2	4.5	3	1	3	4.5	19714.7397	-0.0008
4	2	2	3.5	3	1	3	2.5	19715.3097	-0.0008
4	2	2	3.5	3	1	3	3.5	19717.4939	0.0001
4	2	2	4.5	3	1	3	3.5	19719.3896	-0.0001
11	1	11	10.5	10	1	10	9.5	19773.6226	0.0004
11	1	11	11.5	10	1	10	10.5	19773.7172	-0.0013
11	1	11	9.5	10	1	10	8.5	19774.0016	-0.0031
11	1	11	12.5	10	1	10	11.5	19774.0885	0.0012
10	1	9	10.5	9	1	8	9.5	19802.7677	-0.0012
10	1	9	9.5	9	1	8	8.5	19803.1277	-0.0010
10	1	9	11.5	9	1	8	10.5	19803.6813	-0.0005
10	1	9	8.5	9	1	8	7.5	19804.0372	-0.0007
10	2	8	11.5	9	2	7	10.5	19943.4406	-0.0016
10	2	8	8.5	9	2	7	7.5	19943.5270	-0.0004
5	2	4	4.5	4	1	3	4.5	19976.8759	-0.0012
5	2	4	5.5	4	1	3	4.5	19978.1024	-0.0004
5	2	4	3.5	4	1	3	3.5	19978.3160	-0.0022
5	2	4	4.5	4	1	3	3.5	19982.7151	-0.0007
11	0	11	11.5	10	0	10	10.5	19986.6605	-0.0005
11	0	11	10.5	10	0	10	9.5	19986.7825	-0.0005
11	0	11	12.5	10	0	10	11.5	19987.7492	-0.0020
11	0	11	9.5	10	0	10	8.5	19987.8346	0.0007
5	2	4	6.5	4	1	3	5.5	19990.3494	0.0014
5	2	4	3.5	4	1	3	2.5	19994.9298	0.0000
11	1	11	11.5	10	0	10	10.5	20626.1690	0.0006
11	1	11	10.5	10	0	10	9.5	20626.5583	0.0004
11	1	11	12.5	10	0	10	11.5	20629.1521	0.0002
11	1	11	9.5	10	0	10	8.5	20629.4574	-0.0004

Table S5: Observed Transition Frequencies (in MHz) for (*Z*)-$CH^{37}ClCHF$-$H^{13}C^{13}CH$

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
1	1	1	1.5	0	0	0	1.5	5521.6294	-0.0041
1	1	1	2.5	0	0	0	1.5	5535.9496	0.0025
1	1	1	0.5	0	0	0	1.5	5547.4137	-0.0029
3	1	2	4.5	2	1	1	3.5	5779.0702	-0.0006
3	1	2	3.5	2	1	1	2.5	5780.8756	-0.0004
3	1	2	1.5	2	1	1	0.5	5781.7680	-0.0020
3	1	2	2.5	2	1	1	1.5	5783.5844	-0.0024
5	0	5	3.5	4	1	4	2.5	6095.5534	0.0020
5	0	5	6.5	4	1	4	5.5	6098.2764	-0.0017
5	0	5	4.5	4	1	4	3.5	6104.1481	0.0004
5	0	5	5.5	4	1	4	4.5	6106.8294	0.0001
4	1	4	4.5	3	1	3	4.5	6984.8172	-0.0028
4	1	4	2.5	3	1	3	1.5	6988.1482	-0.0004
4	1	4	3.5	3	1	3	2.5	6988.7148	-0.0006
4	1	4	5.5	3	1	3	4.5	6988.8968	-0.0006
4	1	4	4.5	3	1	3	3.5	6989.4547	-0.0008
4	1	4	3.5	3	1	3	3.5	6990.8924	-0.0007
4	1	4	2.5	3	1	3	2.5	6992.8208	0.0023
2	1	2	2.5	1	0	1	1.5	7183.5848	-0.0009
2	1	2	1.5	1	0	1	1.5	7188.2225	-0.0025
2	1	2	2.5	1	0	1	2.5	7191.4427	-0.0011
2	1	2	0.5	1	0	1	1.5	7194.7002	-0.0038
2	1	2	1.5	1	0	1	2.5	7196.0805	-0.0025
2	1	2	3.5	1	0	1	2.5	7197.8852	0.0025
2	1	2	1.5	1	0	1	0.5	7202.3584	-0.0021
2	1	2	0.5	1	0	1	0.5	7208.8377	-0.0019
4	0	4	2.5	3	0	3	2.5	7289.1253	-0.0009
4	0	4	3.5	3	0	3	3.5	7291.7083	-0.0003
4	0	4	4.5	3	0	3	3.5	7293.6807	-0.0006
4	0	4	5.5	3	0	3	4.5	7294.6521	-0.0002
4	0	4	3.5	3	0	3	2.5	7294.7858	-0.0012
4	0	4	2.5	3	0	3	1.5	7295.7559	-0.0009
4	0	4	4.5	3	0	3	4.5	7300.3014	-0.0001
4	2	3	2.5	3	2	2	1.5	7349.6672	-0.0007
4	2	3	5.5	3	2	2	4.5	7350.7387	-0.0006
4	2	3	3.5	3	2	2	2.5	7352.7033	-0.0011
4	2	3	4.5	3	2	2	3.5	7353.7571	-0.0021
4	2	2	2.5	3	2	1	1.5	7411.2640	-0.0005
4	2	2	5.5	3	2	1	4.5	7412.5362	0.0006
4	2	2	3.5	3	2	1	2.5	7415.2662	-0.0011
4	2	2	4.5	3	2	1	3.5	7416.5244	-0.0002
4	1	3	2.5	3	1	2	2.5	7684.2432	-0.0014
4	1	3	3.5	3	1	2	3.5	7693.3552	-0.0010

Table S5: Observed Transition Frequencies (in MHz) for (*Z*)-$CH^{37}ClCHF$-$H^{13}C^{13}CH$

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
4	1	3	5.5	3	1	2	4.5	7698.6731	0.0003
4	1	3	4.5	3	1	2	3.5	7699.2092	0.0003
4	1	3	2.5	3	1	2	1.5	7700.3534	0.0004
4	1	3	3.5	3	1	2	2.5	7700.8947	0.0000
4	1	3	4.5	3	1	2	4.5	7715.3427	-0.0015
6	0	6	4.5	5	1	5	3.5	8195.0011	0.0007
6	0	6	7.5	5	1	5	6.5	8196.8955	0.0002
6	0	6	5.5	5	1	5	4.5	8202.1479	-0.0006
6	0	6	6.5	5	1	5	5.5	8203.9986	0.0006
5	1	5	5.5	4	1	4	5.5	8721.2961	-0.0018
5	1	5	3.5	4	1	4	2.5	8724.9398	-0.0006
5	1	5	4.5	4	1	4	3.5	8725.0595	-0.0011
5	1	5	6.5	4	1	4	5.5	8725.2591	-0.0015
5	1	5	5.5	4	1	4	4.5	8725.3739	-0.0013
5	1	5	4.5	4	1	4	4.5	8726.4961	-0.0020
5	1	5	3.5	4	1	4	3.5	8729.0426	-0.0009
3	1	3	3.5	2	0	2	2.5	8760.9748	0.0000
3	1	3	2.5	2	0	2	2.5	8763.1509	-0.0016
3	1	3	2.5	2	0	2	1.5	8768.3926	-0.0009
3	1	3	4.5	2	0	2	3.5	8772.9730	0.0025
3	1	3	1.5	2	0	2	1.5	8773.0574	-0.0060
3	1	3	1.5	2	0	2	0.5	8780.4365	-0.0016
5	0	5	3.5	4	0	4	3.5	9068.0622	-0.0014
5	0	5	4.5	4	0	4	4.5	9070.5828	-0.0014
5	0	5	5.5	4	0	4	4.5	9071.8275	-0.0007
5	0	5	4.5	4	0	4	3.5	9072.5560	-0.0009
5	0	5	6.5	4	0	4	5.5	9073.0035	-0.0002
5	0	5	3.5	4	0	4	2.5	9073.7230	-0.0014
5	0	5	5.5	4	0	4	5.5	9077.4777	0.0002
5	2	4	3.5	4	2	3	2.5	9181.0014	0.0005
5	2	4	6.5	4	2	3	5.5	9181.1933	-0.0004
5	2	4	4.5	4	2	3	3.5	9182.3988	-0.0005
5	2	4	5.5	4	2	3	4.5	9182.5764	-0.0005
5	3	3	3.5	4	3	2	2.5	9213.2359	0.0002
5	3	3	6.5	4	3	2	5.5	9214.4495	-0.0016
5	3	2	3.5	4	3	1	2.5	9216.0927	0.0024
5	3	3	4.5	4	3	2	3.5	9216.9569	0.0002
5	3	2	6.5	4	3	1	5.5	9217.3199	0.0002
5	3	3	5.5	4	3	2	4.5	9218.1658	0.0003
5	3	2	4.5	4	3	1	3.5	9219.8695	0.0012
5	3	2	5.5	4	3	1	4.5	9221.0906	-0.0008
5	2	3	3.5	4	2	2	3.5	9298.0845	0.0017
5	2	3	3.5	4	2	2	2.5	9303.2986	0.0014

Table S5: Observed Transition Frequencies (in MHz) for (*Z*)-$CH^{37}ClCHF\text{-}H^{13}C^{13}CH$

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
5	2	3	6.5	4	2	2	5.5	9303.6673	0.0000
5	2	3	4.5	4	2	2	3.5	9305.8641	0.0003
5	2	3	5.5	4	2	2	4.5	9306.2261	0.0001
5	2	3	5.5	4	2	2	5.5	9311.4624	-0.0024
8	2	6	8.5	8	1	7	8.5	9533.5801	-0.0009
8	2	6	7.5	8	1	7	7.5	9534.0241	-0.0010
8	2	6	9.5	8	1	7	9.5	9536.2379	0.0000
8	2	6	6.5	8	1	7	6.5	9536.6822	-0.0003
5	1	4	3.5	4	1	3	3.5	9595.3770	0.0016
5	1	4	4.5	4	1	3	4.5	9606.2358	-0.0001
5	1	4	6.5	4	1	3	5.5	9610.9018	0.0005
5	1	4	5.5	4	1	3	4.5	9610.9607	0.0000
5	1	4	3.5	4	1	3	2.5	9612.0245	-0.0010
5	1	4	4.5	4	1	3	3.5	9612.0883	-0.0003
5	1	4	5.5	4	1	3	5.5	9627.6300	-0.0020
7	2	5	7.5	7	1	6	7.5	9706.1782	-0.0021
7	2	5	6.5	7	1	6	6.5	9707.1335	-0.0016
7	2	5	8.5	7	1	6	8.5	9710.8472	-0.0001
7	2	5	5.5	7	1	6	5.5	9711.7976	-0.0011
6	2	4	6.5	6	1	5	6.5	9957.0443	-0.0028
6	2	4	5.5	6	1	5	5.5	9958.6442	-0.0017
6	2	4	7.5	6	1	5	7.5	9963.7917	0.0005
6	2	4	4.5	6	1	5	4.5	9965.3851	-0.0022
5	2	3	5.5	5	1	4	5.5	10251.9713	-0.0011
5	2	3	4.5	5	1	4	4.5	10254.4960	-0.0013
4	1	4	4.5	3	0	3	3.5	10258.6812	0.0009
4	1	4	3.5	3	0	3	3.5	10260.1184	0.0006
5	2	3	6.5	5	1	4	6.5	10260.9064	0.0008
4	1	4	3.5	3	0	3	2.5	10263.1954	-0.0007
5	2	3	3.5	5	1	4	3.5	10263.4284	-0.0012
4	1	4	4.5	3	0	3	4.5	10265.3008	0.0003
4	1	4	2.5	3	0	3	2.5	10267.3000	0.0007
4	1	4	5.5	3	0	3	4.5	10269.3802	0.0023
4	1	4	2.5	3	0	3	1.5	10273.9304	0.0005
7	0	7	5.5	6	1	6	4.5	10286.5966	0.0006
7	0	7	8.5	6	1	6	7.5	10287.9441	0.0002
7	0	7	6.5	6	1	6	5.5	10292.4224	0.0004
7	0	7	7.5	6	1	6	6.5	10293.7141	0.0002
6	1	6	6.5	5	1	5	6.5	10450.9189	-0.0008
6	1	6	5.5	5	1	5	4.5	10454.7219	-0.0006
6	1	6	4.5	5	1	5	3.5	10454.8126	-0.0009
6	1	6	6.5	5	1	5	5.5	10454.8816	-0.0009
6	1	6	7.5	5	1	5	6.5	10454.9764	-0.0006

Table S5: Observed Transition Frequencies (in MHz) for (*Z*)-$CH^{37}ClCHF$-$H^{13}C^{13}CH$

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
6	1	6	5.5	5	1	5	5.5	10455.8442	-0.0012
6	1	6	4.5	5	1	5	4.5	10458.7957	-0.0007
4	2	2	5.5	4	1	3	4.5	10551.4723	0.0039
4	2	2	3.5	4	1	3	4.5	10554.8685	-0.0009
4	2	2	2.5	4	1	3	3.5	10555.5049	-0.0029
4	2	2	4.5	4	1	3	4.5	10556.7076	0.0005
4	2	2	3.5	4	1	3	3.5	10560.7218	-0.0004
4	2	2	4.5	4	1	3	3.5	10562.5620	0.0022
4	2	2	5.5	4	1	3	5.5	10568.1425	0.0028
4	2	2	2.5	4	1	3	2.5	10572.1581	0.0002
4	2	2	4.5	4	1	3	5.5	10573.3787	0.0003
4	2	2	3.5	4	1	3	2.5	10577.3741	0.0019
6	0	6	4.5	5	0	5	4.5	10819.8964	0.0002
6	0	6	5.5	5	0	5	5.5	10821.8168	-0.0005
6	0	6	6.5	5	0	5	5.5	10822.5435	-0.0004
6	0	6	5.5	5	0	5	4.5	10823.0603	-0.0010
6	0	6	7.5	5	0	5	6.5	10823.8773	-0.0005
6	0	6	4.5	5	0	5	3.5	10824.3889	-0.0006
6	0	6	6.5	5	0	5	6.5	10827.0161	-0.0016
3	2	1	4.5	3	1	2	3.5	10838.1465	0.0048
3	2	1	2.5	3	1	2	3.5	10838.8098	-0.0012
3	2	1	3.5	3	1	2	3.5	10839.3920	0.0006
3	2	1	1.5	3	1	2	2.5	10845.1337	-0.0043
3	2	1	2.5	3	1	2	2.5	10846.3478	-0.0017
3	2	1	3.5	3	1	2	2.5	10846.9300	0.0000
3	2	1	4.5	3	1	2	4.5	10854.2823	0.0053
3	2	1	3.5	3	1	2	4.5	10855.5319	0.0052
3	2	1	1.5	3	1	2	1.5	10861.2430	-0.0033
3	2	1	2.5	3	1	2	1.5	10862.4579	0.0000
6	2	5	7.5	5	2	4	6.5	11006.0941	-0.0008
6	2	5	4.5	5	2	4	3.5	11006.1296	0.0000
6	2	5	6.5	5	2	4	5.5	11006.7512	-0.0004
6	2	5	5.5	5	2	4	4.5	11006.8055	-0.0001
6	3	4	4.5	5	3	3	3.5	11063.9296	0.0004
6	3	4	7.5	5	3	3	6.5	11064.3888	0.0002
6	3	4	5.5	5	3	3	4.5	11066.1205	0.0010
2	2	0	2.5	2	1	1	2.5	11071.5555	-0.0022
2	2	0	1.5	2	1	1	2.5	11076.8054	-0.0034
2	2	0	3.5	2	1	1	2.5	11078.9130	0.0038
2	2	0	2.5	2	1	1	1.5	11081.8066	-0.0005
2	2	0	2.5	2	1	1	3.5	11085.8900	0.0022
2	2	0	1.5	2	1	1	1.5	11087.0552	-0.0030
2	2	0	3.5	2	1	1	3.5	11093.2462	0.0069

Table S5: Observed Transition Frequencies (in MHz) for (*Z*)-$CH^{37}ClCHF\text{-}H^{13}C^{13}CH$

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
2	2	0	0.5	2	1	1	1.5	11094.4315	-0.0014
2	2	0	1.5	2	1	1	0.5	11101.3475	-0.0021
2	2	0	0.5	2	1	1	0.5	11108.7242	-0.0001
6	2	4	4.5	5	2	3	3.5	11216.3953	0.0000
6	2	4	7.5	5	2	3	6.5	11216.5143	0.0001
6	2	4	5.5	5	2	3	4.5	11218.3917	0.0004
6	2	4	6.5	5	2	3	5.5	11218.5063	0.0007
6	1	5	4.5	5	1	4	4.5	11497.7235	-0.0008
6	1	5	5.5	5	1	4	5.5	11509.5182	0.0003
6	1	5	6.5	5	1	4	5.5	11513.4314	0.0005
6	1	5	7.5	5	1	4	6.5	11513.6288	0.0002
6	1	5	5.5	5	1	4	4.5	11514.2424	-0.0003
6	1	5	4.5	5	1	4	3.5	11514.4377	0.0001
6	1	5	6.5	5	1	4	6.5	11530.1613	-0.0002
2	2	1	2.5	2	1	2	3.5	11606.8048	-0.0027
2	2	1	1.5	2	1	2	0.5	11607.7375	-0.0005
2	2	1	2.5	2	1	2	1.5	11608.6086	0.0015
2	2	1	2.5	2	1	2	2.5	11613.2455	-0.0009
2	2	1	1.5	2	1	2	1.5	11614.2149	-0.0022
2	2	1	3.5	2	1	2	3.5	11614.6564	0.0018
2	2	1	0.5	2	1	2	0.5	11615.6013	0.0004
2	2	1	1.5	2	1	2	2.5	11618.8528	-0.0035
2	2	1	3.5	2	1	2	2.5	11621.0977	0.0043
2	2	1	0.5	2	1	2	1.5	11622.0791	-0.0009
5	1	5	5.5	4	0	4	4.5	11690.3743	0.0002
5	1	5	4.5	4	0	4	4.5	11691.4996	0.0026
5	1	5	4.5	4	0	4	3.5	11693.4700	0.0002
5	1	5	5.5	4	0	4	5.5	11696.0248	0.0014
5	1	5	3.5	4	0	4	3.5	11697.4546	0.0019
5	1	5	6.5	4	0	4	5.5	11699.9880	0.0018
5	1	5	3.5	4	0	4	2.5	11703.1127	-0.0007
3	2	2	1.5	3	1	3	1.5	11881.1048	0.0008
3	2	2	4.5	3	1	3	4.5	11883.2934	-0.0006
3	2	2	2.5	3	1	3	2.5	11885.7599	-0.0009
3	2	2	3.5	3	1	3	3.5	11887.9411	0.0004
7	1	7	6.5	6	1	6	5.5	12177.1273	0.0000
7	1	7	7.5	6	1	6	6.5	12177.2182	0.0001
7	1	7	5.5	6	1	6	4.5	12177.3353	-0.0003
7	1	7	8.5	6	1	6	7.5	12177.4284	-0.0003
4	2	3	2.5	4	1	4	2.5	12242.6231	-0.0002
4	2	3	5.5	4	1	4	5.5	12245.1370	0.0010
4	2	3	3.5	4	1	4	2.5	12245.6509	0.0042
4	2	3	2.5	4	1	4	3.5	12246.7264	-0.0001

Table S5: Observed Transition Frequencies (in MHz) for (*Z*)-$CH^{37}ClCHF$-$H^{13}C^{13}CH$

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
4	2	3	4.5	4	1	4	5.5	12248.1660	-0.0010
4	2	3	5.5	4	1	4	4.5	12249.2172	0.0039
4	2	3	3.5	4	1	4	3.5	12249.7481	-0.0017
4	2	3	4.5	4	1	4	3.5	12250.8093	0.0025
4	2	3	3.5	4	1	4	4.5	12251.1857	-0.0017
4	2	3	4.5	4	1	4	4.5	12252.2433	-0.0010
8	0	8	6.5	7	1	7	5.5	12350.7494	0.0021
8	0	8	9.5	7	1	7	8.5	12351.7268	0.0017
8	0	8	7.5	7	1	7	6.5	12355.3711	0.0016
8	0	8	8.5	7	1	7	7.5	12356.2570	0.0019
7	0	7	7.5	6	0	6	6.5	12544.5979	-0.0003
7	0	7	6.5	6	0	6	5.5	12544.9957	-0.0003
7	0	7	8.5	6	0	6	7.5	12546.0257	0.0001
7	0	7	5.5	6	0	6	4.5	12546.4085	-0.0006
5	2	4	3.5	5	1	5	3.5	12698.6828	-0.0010
5	2	4	6.5	5	1	5	6.5	12701.0685	-0.0007
5	2	4	4.5	5	1	5	4.5	12707.0894	0.0009
5	2	4	5.5	5	1	5	5.5	12709.4460	-0.0001
7	2	6	8.5	6	2	5	7.5	12824.5547	0.0011
7	2	6	5.5	6	2	5	4.5	12824.6418	-0.0009
7	2	6	7.5	6	2	5	6.5	12824.8176	-0.0009
7	2	6	6.5	6	2	5	5.5	12824.9501	0.0010
7	3	4	5.5	6	3	3	4.5	12933.3181	0.0011
7	3	4	8.5	6	3	3	7.5	12933.5532	-0.0005
6	1	6	6.5	5	0	5	5.5	13073.4291	0.0008
6	1	6	5.5	5	0	5	5.5	13074.3948	0.0035
6	1	6	5.5	5	0	5	4.5	13075.6358	0.0005
6	1	6	6.5	5	0	5	6.5	13077.9063	0.0042
6	1	6	4.5	5	0	5	4.5	13079.7143	0.0050
6	1	6	7.5	5	0	5	6.5	13081.9615	0.0020
6	1	6	4.5	5	0	5	3.5	13084.2040	0.0015
7	2	5	5.5	6	2	4	4.5	13151.3005	0.0009
7	2	5	8.5	6	2	4	7.5	13151.3286	0.0008
7	2	5	6.5	6	2	4	5.5	13153.0028	0.0023
7	2	5	7.5	6	2	4	6.5	13153.0255	-0.0002
6	2	5	4.5	6	1	6	4.5	13250.0028	0.0029
6	2	5	7.5	6	1	6	7.5	13252.1870	0.0001
6	2	5	5.5	6	1	6	5.5	13259.1696	-0.0021
6	2	5	6.5	6	1	6	6.5	13261.3153	0.0001
7	1	6	7.5	6	1	5	6.5	13403.8935	0.0010
7	1	6	8.5	6	1	5	7.5	13404.2727	0.0010
7	1	6	6.5	6	1	5	5.5	13404.5118	0.0005
7	1	6	5.5	6	1	5	4.5	13404.8879	-0.0004

Table S5: Observed Transition Frequencies (in MHz) for (*Z*)-$CH^{37}ClCHF\text{-}H^{13}C^{13}CH$

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
8	1	8	7.5	7	1	7	6.5	13891.9559	0.0029
8	1	8	8.5	7	1	7	7.5	13892.0082	-0.0006
8	1	8	6.5	7	1	7	5.5	13892.2285	-0.0030
8	1	8	9.5	7	1	7	8.5	13892.2905	0.0015
8	0	8	8.5	7	0	7	7.5	14239.7595	0.0001
8	0	8	7.5	7	0	7	6.5	14240.0739	-0.0009
8	0	8	9.5	7	0	7	8.5	14241.2105	0.0007
8	0	8	6.5	7	0	7	5.5	14241.4870	0.0002
9	0	9	7.5	8	1	8	6.5	14372.5283	0.0029
9	0	9	10.5	8	1	8	9.5	14373.4332	0.0014
9	0	9	8.5	8	1	8	7.5	14376.2605	0.0010
9	0	9	9.5	8	1	8	8.5	14376.7014	0.0014
7	1	7	7.5	6	0	6	6.5	14428.1031	0.0006
7	1	7	6.5	6	0	6	5.5	14429.7009	-0.0004
7	1	7	8.5	6	0	6	7.5	14435.5115	0.0011
7	1	7	5.5	6	0	6	4.5	14437.1487	0.0001
8	2	7	8.5	7	2	6	7.5	14635.6559	-0.0011
8	2	7	6.5	7	2	6	5.5	14635.7194	0.0011
8	2	7	9.5	7	2	6	8.5	14635.7688	-0.0002
8	2	7	7.5	7	2	6	6.5	14635.9814	-0.0024
8	3	6	6.5	7	3	5	5.5	14770.0422	0.0012
8	3	6	9.5	7	3	5	8.5	14770.0998	0.0003
8	3	6	7.5	7	3	5	6.5	14771.0247	-0.0004
8	3	6	8.5	7	3	5	7.5	14771.0796	0.0005
8	3	5	6.5	7	3	4	5.5	14804.0088	0.0029
8	3	5	9.5	7	3	4	8.5	14804.1003	0.0021
8	3	5	7.5	7	3	4	6.5	14805.2428	0.0004
8	3	5	8.5	7	3	4	7.5	14805.3319	0.0001
2	2	1	2.5	1	1	0	1.5	14926.2997	0.0003
2	2	1	1.5	1	1	0	1.5	14931.9071	-0.0023
2	2	1	2.5	1	1	0	2.5	14932.7508	-0.0018
2	2	1	1.5	1	1	0	2.5	14938.3598	-0.0027
2	2	1	0.5	1	1	0	1.5	14939.7694	-0.0029
2	2	1	3.5	1	1	0	2.5	14940.6041	0.0045
2	2	1	1.5	1	1	0	0.5	14943.5596	0.0016
2	2	1	0.5	1	1	0	0.5	14951.4195	-0.0014
8	2	6	9.5	7	2	5	8.5	15105.2178	0.0022
8	2	6	8.5	7	2	5	7.5	15106.6923	0.0001
8	2	6	7.5	7	2	5	6.5	15106.7107	-0.0007
2	2	0	1.5	1	1	1	0.5	15106.8181	0.0025
2	2	0	2.5	1	1	1	2.5	15113.0323	-0.0016
2	2	0	0.5	1	1	1	0.5	15114.1912	0.0009
2	2	0	3.5	1	1	1	2.5	15120.3873	0.0019

Table S5: Observed Transition Frequencies (in MHz) for (*Z*)-$CH^{37}ClCHF$-$H^{13}C^{13}CH$

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
2	2	0	2.5	1	1	1	1.5	15127.3525	0.0050
2	2	0	1.5	1	1	1	1.5	15132.5987	0.0001
8	1	7	8.5	7	1	6	7.5	15279.2913	-0.0002
8	1	7	7.5	7	1	6	6.5	15279.8245	0.0013
8	1	7	9.5	7	1	6	8.5		
8	1	7	6.5	7	1	6	5.5	15280.3495	0.0006
9	1	9	8.5	8	1	8	7.5	15599.1688	-0.0012
9	1	9	9.5	8	1	8	8.5	15599.2078	0.0007
9	1	9	7.5	8	1	8	6.5	15599.4887	-0.0024
9	1	9	10.5	8	1	8	9.5	15599.5296	0.0004
8	1	8	8.5	7	0	7	7.5	15775.5126	-0.0005
8	1	8	7.5	7	0	7	6.5	15776.6582	-0.0001
8	1	8	9.5	7	0	7	8.5	15781.7742	0.0003
8	1	8	6.5	7	0	7	5.5	15782.9688	-0.0022
9	0	9	9.5	8	0	8	8.5	15912.4532	-0.0005
9	0	9	8.5	8	0	8	7.5	15912.8425	-0.0005
9	0	9	10.5	8	0	8	9.5	15913.9965	0.0007
10	0	10	8.5	9	1	9	7.5	16344.1784	0.0001
10	0	10	11.5	9	1	9	10.5	16344.5485	0.0014
10	0	10	9.5	9	1	9	8.5	16346.6579	0.0002
10	0	10	10.5	9	1	9	9.5	16347.1614	0.0012
3	2	2	3.5	2	1	1	2.5	16588.1728	0.0002
3	2	2	2.5	2	1	1	1.5	16598.4164	-0.0032
3	2	2	4.5	2	1	1	3.5	16602.4969	0.0054
3	2	2	1.5	2	1	1	0.5	16612.7219	-0.0023
9	1	9	9.5	8	0	8	8.5	17134.9596	-0.0012
9	1	9	8.5	8	0	8	7.5	17135.7538	0.0003
9	1	8	9.5	8	1	7	8.5	17136.2111	0.0000
9	1	8	8.5	8	1	7	7.5	17136.5873	-0.0012
9	1	8	10.5	8	1	7	9.5	17136.8899	-0.0007
9	1	8	7.5	8	1	7	6.5	17137.2679	-0.0010
9	1	9	10.5	8	0	8	9.5	17140.0936	0.0003
9	1	9	7.5	8	0	8	6.5	17140.9752	-0.0001
3	2	1	1.5	2	1	2	0.5	17155.6673	0.0006
3	2	1	4.5	2	1	2	3.5	17160.8886	0.0003
3	2	1	3.5	2	1	2	3.5	17162.1337	-0.0044
3	2	1	1.5	2	1	2	1.5	17162.1482	0.0025
3	2	1	2.5	2	1	2	1.5	17163.3559	-0.0014
3	2	1	2.5	2	1	2	2.5	17167.9939	-0.0025
3	2	1	3.5	2	1	2	2.5	17168.5765	-0.0005
10	1	10	9.5	9	1	9	8.5	17299.0198	-0.0006
10	1	10	10.5	9	1	9	9.5	17299.0485	-0.0004
10	1	10	8.5	9	1	9	7.5	17299.3659	0.0002

Table S5: Observed Transition Frequencies (in MHz) for (*Z*)-$CH^{37}ClCHF$-$H^{13}C^{13}CH$

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
10	1	10	11.5	9	1	9	10.5	17299.3934	-0.0011
10	0	10	9.5	9	0	9	8.5	17569.5677	-0.0005
10	0	10	10.5	9	0	9	9.5	17569.6674	0.0001
10	0	10	11.5	9	0	9	10.5	17570.6449	0.0004
10	0	10	8.5	9	0	9	7.5	17571.1435	-0.0005
4	2	3	4.5	3	1	2	3.5	18161.0566	0.0009
4	2	3	3.5	3	1	2	2.5	18167.5361	-0.0012
4	2	3	5.5	3	1	2	4.5	18174.1649	0.0050
4	2	3	2.5	3	1	2	1.5	18180.6226	0.0005
6	3	3	6.5	6	2	4	6.5	18604.1649	-0.0021
6	3	3	5.5	6	2	4	5.5	18605.6302	0.0011
6	3	3	4.5	6	2	4	4.5	18611.6902	-0.0002
5	3	2	5.5	5	2	3	5.5	18748.3864	0.0001
5	3	2	4.5	5	2	3	4.5	18750.1744	-0.0022
5	3	2	6.5	5	2	3	6.5	18754.7446	0.0015
5	3	2	3.5	5	2	3	3.5	18756.5332	-0.0026
4	3	1	4.5	4	2	2	4.5	18833.5207	-0.0002
4	3	1	3.5	4	2	2	3.5	18836.1697	-0.0024
4	3	1	5.5	4	2	2	5.5	18841.0926	0.0019
4	3	1	2.5	4	2	2	2.5	18843.7404	-0.0023
4	3	2	3.5	4	2	3	3.5	18929.2756	-0.0008
4	3	2	5.5	4	2	3	5.5	18932.7925	0.0025
4	3	2	2.5	4	2	3	2.5	18934.6901	-0.0002
5	3	3	5.5	5	2	4	5.5	18962.9824	0.0003
5	3	3	4.5	5	2	4	4.5	18963.8330	-0.0009
5	3	3	6.5	5	2	4	6.5	18966.0494	0.0018
5	3	3	3.5	5	2	4	3.5	18966.9248	-0.0004
10	1	9	10.5	9	1	8	9.5	18970.9628	-0.0033
10	1	9	9.5	9	1	8	8.5	18971.3151	-0.0022
10	1	9	11.5	9	1	8	10.5	18971.7890	-0.0013
10	1	9	8.5	9	1	8	7.5	18972.1342	-0.0043
6	3	4	6.5	6	2	5	6.5	19022.8042	0.0009
6	3	4	5.5	6	2	5	5.5	19023.1469	-0.0009
6	3	4	7.5	6	2	5	7.5	19024.3434	0.0021
6	3	4	4.5	6	2	5	4.5	19024.7267	0.0019
4	2	2	2.5	3	1	3	1.5	19322.6604	-0.0002
4	2	2	5.5	3	1	3	4.5	19326.6822	-0.0037
4	2	2	3.5	3	1	3	2.5	19332.5439	-0.0009
5	2	4	5.5	4	1	3	4.5	19644.4253	0.0015
5	2	4	4.5	4	1	3	3.5	19649.0411	-0.0007
5	2	4	6.5	4	1	3	5.5	19656.6859	0.0051
5	2	4	3.5	4	1	3	2.5	19661.2715	0.0014

Table S6: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}Cl^{13}CHF-HCCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
2	1	2	2.5	1	0	1	1.5	7401.3867	-0.0007
2	1	2	3.5	1	0	1	2.5	7419.5196	0.0025
4	0	4	4.5	3	0	3	3.5	7596.0657	0.0014
4	0	4	5.5	3	0	3	4.5	7597.3398	0.0005
4	0	4	3.5	3	0	3	2.5	7597.4718	-0.0018
3	1	3	3.5	2	0	2	2.5	9041.3636	-0.0004
3	1	3	2.5	2	0	2	1.5	9050.7568	-0.0014
3	1	3	4.5	2	0	2	3.5	9056.5600	-0.0016
5	0	5	5.5	4	0	4	4.5	9445.6528	-0.0008
5	0	5	4.5	4	0	4	3.5	9446.5850	-0.0008
5	0	5	6.5	4	0	4	5.5	9447.1923	-0.0014
5	0	5	3.5	4	0	4	2.5	9448.1164	0.0028
4	1	4	4.5	3	0	3	3.5	10597.1920	0.0006
4	1	4	5.5	3	0	3	4.5	10610.7188	-0.0010
5	1	5	5.5	4	0	4	4.5	12083.9893	0.0004
5	1	5	4.5	4	0	4	3.5	12087.8884	0.0009
5	1	5	6.5	4	0	4	5.5	12096.1113	0.0020
5	1	5	3.5	4	0	4	2.5	12100.0556	-0.0018
6	1	6	6.5	5	0	5	5.5	13520.7703	0.0012
6	1	6	5.5	5	0	5	4.5	13523.5354	0.0017
6	1	6	7.5	5	0	5	6.5	13531.4827	0.0003
6	1	6	4.5	5	0	5	3.5	13534.3017	-0.0016
7	1	7	7.5	6	0	6	6.5	14929.5334	0.0015
7	1	7	8.5	6	0	6	7.5	14938.7811	-0.0027
2	2	1	2.5	1	1	0	1.5	15318.2389	-0.0012
2	2	1	3.5	1	1	0	2.5	15336.3750	0.0000
2	2	0	3.5	1	1	1	2.5	15525.9056	0.0001
2	2	0	2.5	1	1	1	1.5	15534.7674	0.0016
3	2	2	3.5	2	1	1	2.5	17047.0773	-0.0010
3	2	2	4.5	2	1	1	3.5	17065.2429	0.0006

Table S7: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-HC^{13}CH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
1	1	1	1.5	0	0	0	1.5	5680.2583	-0.0011
1	1	1	2.5	0	0	0	1.5	5698.4183	0.0005
1	1	1	0.5	0	0	0	1.5	5712.9724	-0.0014
4	1	4	4.5	3	1	3	4.5	7134.0121	-0.0016
4	1	4	2.5	3	1	3	1.5	7138.2189	0.0006
4	1	4	3.5	3	1	3	2.5	7138.9454	0.0014
4	1	4	5.5	3	1	3	4.5	7139.1738	0.0006
4	1	4	4.5	3	1	3	3.5	7139.8865	0.0012
4	1	4	3.5	3	1	3	3.5	7141.7067	0.0000
4	1	4	2.5	3	1	3	2.5	7144.1416	-0.0025
2	1	2	2.5	1	0	1	1.5	7378.8887	-0.0008
2	1	2	1.5	1	0	1	1.5	7384.7791	-0.0025
2	1	2	2.5	1	0	1	2.5	7388.8599	-0.0009
2	1	2	3.5	1	0	1	2.5	7397.0238	0.0023
2	1	2	1.5	1	0	1	0.5	7402.7136	-0.0024
2	1	2	0.5	1	0	1	0.5	7410.9350	-0.0050
4	0	4	2.5	3	0	3	2.5	7442.4855	-0.0014
4	0	4	4.5	3	0	3	3.5	7448.3333	0.0022
4	0	4	5.5	3	0	3	4.5	7449.5394	0.0004
4	0	4	3.5	3	0	3	2.5	7449.7291	0.0006
4	0	4	2.5	3	0	3	1.5	7450.9349	0.0002
4	0	4	4.5	3	0	3	4.5	7456.7632	0.0003
4	1	3	2.5	3	1	2	2.5	7838.7243	-0.0009
4	1	3	3.5	3	1	2	3.5	7850.2877	0.0006
4	1	3	5.5	3	1	2	4.5	7857.0337	0.0007
4	1	3	4.5	3	1	2	3.5	7857.7207	0.0009
4	1	3	2.5	3	1	2	1.5	7859.1627	0.0006
4	1	3	3.5	3	1	2	2.5	7859.8584	0.0005
4	1	3	4.5	3	1	2	4.5	7878.2002	0.0012
5	1	5	5.5	4	1	4	5.5	8908.2008	-0.0018
5	1	5	3.5	4	1	4	2.5	8912.8018	0.0001
5	1	5	4.5	4	1	4	3.5	8912.9608	-0.0007
5	1	5	6.5	4	1	4	5.5	8913.2110	0.0000
5	1	5	5.5	4	1	4	4.5	8913.3623	0.0002
5	1	5	4.5	4	1	4	4.5	8914.7812	-0.0017
5	1	5	3.5	4	1	4	3.5	8918.0005	-0.0011
3	1	3	3.5	2	0	2	2.5	8992.4186	0.0000
3	1	3	2.5	2	0	2	2.5	8995.1809	-0.0004
3	1	3	3.5	2	0	2	3.5	9001.7731	0.0025
3	1	3	2.5	2	0	2	1.5	9001.8353	-0.0004
3	1	3	4.5	2	0	2	3.5	9007.6451	0.0029
3	1	3	1.5	2	0	2	0.5	9017.1360	-0.0001
5	0	5	3.5	4	0	4	3.5	9260.6629	0.0002

Table S7: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-HC^{13}CH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
5	0	5	4.5	4	0	4	4.5	9263.9324	-0.0006
5	0	5	5.5	4	0	4	4.5	9265.5278	-0.0002
5	0	5	4.5	4	0	4	3.5	9266.4527	-0.0004
5	0	5	6.5	4	0	4	5.5	9266.9920	0.0000
5	0	5	3.5	4	0	4	2.5	9267.9030	-0.0014
5	0	5	5.5	4	0	4	5.5	9272.7500	-0.0018
5	1	4	4.5	4	1	3	4.5	9803.1840	-0.0007
5	1	4	6.5	4	1	3	5.5	9809.1039	0.0007
5	1	4	5.5	4	1	3	4.5	9809.1871	-0.0006
5	1	4	3.5	4	1	3	2.5	9810.5275	0.0005
5	1	4	4.5	4	1	3	3.5	9810.6174	-0.0001
5	1	4	5.5	4	1	3	5.5	9830.3503	-0.0034
7	0	7	5.5	6	1	6	4.5	10457.9446	-0.0001
7	0	7	8.5	6	1	6	7.5	10459.6869	0.0008
7	0	7	6.5	6	1	6	5.5	10465.4575	-0.0008
7	0	7	7.5	6	1	6	6.5	10467.1160	0.0014
4	1	4	4.5	3	0	3	3.5	10524.8097	-0.0001
4	1	4	3.5	3	0	3	3.5	10526.6312	0.0000
4	1	4	3.5	3	0	3	2.5	10530.5482	-0.0004
4	1	4	4.5	3	0	3	4.5	10533.2414	-0.0001
4	1	4	2.5	3	0	3	2.5	10535.7480	-0.0005
4	1	4	5.5	3	0	3	4.5	10538.4018	0.0009
4	1	4	2.5	3	0	3	1.5	10544.1968	0.0004
6	1	6	5.5	5	1	5	4.5	10680.3007	-0.0007
6	1	6	4.5	5	1	5	3.5	10680.4087	-0.0005
6	1	6	6.5	5	1	5	5.5	10680.5053	-0.0002
6	1	6	7.5	5	1	5	6.5	10680.6184	-0.0005
4	2	2	5.5	4	1	3	4.5	10909.2862	0.0029
4	2	2	3.5	4	1	3	4.5	10913.5611	-0.0046
4	2	2	2.5	4	1	3	3.5	10914.4375	-0.0029
4	2	2	4.5	4	1	3	4.5	10915.8800	0.0003
4	2	2	3.5	4	1	3	3.5	10920.9968	-0.0016
4	2	2	4.5	4	1	3	3.5	10923.3135	0.0011
4	2	2	5.5	4	1	3	5.5	10930.4522	0.0029
4	2	2	2.5	4	1	3	2.5	10935.5729	-0.0001
4	2	2	4.5	4	1	3	5.5	10937.0454	-0.0002
4	2	2	3.5	4	1	3	2.5	10942.1282	-0.0029
6	0	6	6.5	5	0	5	5.5	11055.3897	0.0002
6	0	6	5.5	5	0	5	4.5	11056.0404	-0.0003
6	0	6	7.5	5	0	5	6.5	11057.0546	0.0001
6	0	6	4.5	5	0	5	3.5	11057.6973	-0.0007
6	1	5	6.5	5	1	4	5.5	11751.5078	-0.0002
6	1	5	7.5	5	1	4	6.5	11751.7478	0.0012

Table S7: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-HC^{13}CH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
6	1	5	5.5	5	1	4	4.5	11752.5374	0.0011
6	1	5	4.5	5	1	4	3.5	11752.7697	-0.0008
5	1	5	5.5	4	0	4	4.5	11989.8410	0.0003
5	1	5	4.5	4	0	4	4.5	11991.2630	0.0014
5	1	5	4.5	4	0	4	3.5	11993.7816	0.0000
5	1	5	5.5	4	0	4	5.5	11997.0657	0.0012
5	1	5	3.5	4	0	4	3.5	11998.8204	-0.0014
5	1	5	6.5	4	0	4	5.5	12002.0753	0.0024
5	1	5	3.5	4	0	4	2.5	12006.0638	0.0005
7	1	7	6.5	6	1	6	5.5	12440.3953	-0.0020
7	1	7	7.5	6	1	6	6.5	12440.5135	0.0002
7	1	7	5.5	6	1	6	4.5	12440.6543	0.0005
7	1	7	8.5	6	1	6	7.5	12440.7735	-0.0002
4	2	3	5.5	4	1	4	5.5	12627.0584	0.0010
4	2	3	3.5	4	1	4	2.5	12627.7045	-0.0001
4	2	3	2.5	4	1	4	3.5	12629.0650	-0.0018
4	2	3	5.5	4	1	4	4.5	12632.2196	0.0027
4	2	3	3.5	4	1	4	3.5	12632.9031	-0.0015
4	2	3	4.5	4	1	4	3.5	12634.2465	0.0006
4	2	3	3.5	4	1	4	4.5	12634.7267	0.0007
4	2	3	4.5	4	1	4	4.5	12636.0668	-0.0006
7	0	7	7.5	6	0	6	6.5	12816.5422	-0.0011
7	0	7	6.5	6	0	6	5.5	12817.0479	0.0004
7	0	7	5.5	6	0	6	4.5	12818.8166	0.0018
6	1	6	6.5	5	0	5	5.5	13404.8187	0.0005
6	1	6	5.5	5	0	5	4.5	13407.6296	-0.0003
6	1	6	7.5	5	0	5	6.5	13415.7021	0.0023
6	1	6	4.5	5	0	5	3.5	13418.5689	0.0007
7	1	6	7.5	6	1	5	6.5	13681.9723	-0.0030
7	1	6	8.5	6	1	5	7.5	13682.4412	0.0006
7	1	6	6.5	6	1	5	5.5	13682.7592	0.0007
7	1	6	5.5	6	1	5	4.5	13683.2217	0.0014
7	1	7	7.5	6	0	6	6.5	14789.9422	0.0000
7	1	7	6.5	6	0	6	5.5	14791.9867	0.0001
7	1	7	8.5	6	0	6	7.5	14799.4186	-0.0004
7	1	7	5.5	6	0	6	4.5	14801.5248	0.0008
2	2	1	2.5	1	1	0	1.5	15371.9487	0.0003
2	2	1	1.5	1	1	0	1.5	15379.0623	-0.0038
2	2	1	2.5	1	1	0	2.5	15380.1302	-0.0015
2	2	1	3.5	1	1	0	2.5	15390.0882	0.0024
2	2	1	1.5	1	1	0	0.5	15393.8502	0.0026
2	2	1	0.5	1	1	0	0.5	15403.8257	-0.0011
2	2	0	1.5	1	1	1	0.5	15553.4899	0.0019

Table S7: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-HC^{13}CH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
2	2	0	2.5	1	1	1	2.5	15561.3701	-0.0036
2	2	0	0.5	1	1	1	0.5	15562.8627	0.0001
2	2	0	3.5	1	1	1	2.5	15570.7135	0.0017
2	2	0	2.5	1	1	1	1.5	15579.5358	0.0038
2	2	0	1.5	1	1	1	1.5	15586.2016	-0.0007
8	1	8	8.5	7	0	7	7.5	16166.3825	-0.0005
8	1	8	7.5	7	0	7	6.5	16167.8518	-0.0001
8	1	8	9.5	7	0	7	8.5	16174.4208	0.0003
8	1	8	6.5	7	0	7	5.5	16175.9679	-0.0002
3	2	2	3.5	2	1	1	2.5	17070.4848	0.0012
3	2	2	2.5	2	1	1	1.5	17083.4878	-0.0022
3	2	2	4.5	2	1	1	3.5	17088.6539	0.0036
3	2	1	1.5	2	1	2	0.5	17644.6106	0.0007
3	2	1	4.5	2	1	2	3.5	17651.2270	0.0006
3	2	1	2.5	2	1	2	1.5	17654.3321	-0.0003
3	2	1	2.5	2	1	2	2.5	17660.2232	-0.0013
3	2	1	3.5	2	1	2	2.5	17660.9461	-0.0002
4	2	3	4.5	3	1	2	3.5	18679.2422	-0.0005
4	2	3	3.5	3	1	2	2.5	18687.4727	0.0005
5	3	2	5.5	5	2	3	5.5	19369.2147	-0.0003
5	3	2	4.5	5	2	3	4.5	19371.4682	-0.0009
5	3	2	6.5	5	2	3	6.5	19377.2234	0.0017
5	3	2	3.5	5	2	3	3.5	19379.4790	-0.0006

Table S8: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-H^{13}CCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
1	1	1	1.5	0	0	0	1.5	5724.9382	-0.0011
1	1	1	2.5	0	0	0	1.5	5743.0940	0.0022
1	1	1	0.5	0	0	0	1.5	5757.6400	-0.0027
4	1	4	4.5	3	1	3	4.5	7185.2489	-0.0002
4	1	4	2.5	3	1	3	1.5	7189.4585	0.0004
4	1	4	3.5	3	1	3	2.5	7190.1836	-0.0001
4	1	4	5.5	3	1	3	4.5	7190.4140	0.0006
4	1	4	4.5	3	1	3	3.5	7191.1253	0.0001
4	1	4	3.5	3	1	3	3.5	7192.9459	-0.0023
4	1	4	2.5	3	1	3	2.5	7195.3899	0.0018
2	1	2	2.5	1	0	1	1.5	7435.8376	-0.0005
2	1	2	1.5	1	0	1	1.5	7441.7301	-0.0017
2	1	2	2.5	1	0	1	2.5	7445.7998	-0.0010
2	1	2	3.5	1	0	1	2.5	7453.9666	0.0022
2	1	2	1.5	1	0	1	0.5	7459.6499	-0.0010
2	1	2	0.5	1	0	1	0.5	7467.8752	-0.0019
4	0	4	2.5	3	0	3	2.5	7495.7354	-0.0027
4	0	4	3.5	3	0	3	3.5	7499.0617	0.0002
4	0	4	4.5	3	0	3	3.5	7501.5808	0.0000
4	0	4	5.5	3	0	3	4.5	7502.7866	0.0005
4	0	4	3.5	3	0	3	2.5	7502.9766	-0.0001
4	0	4	2.5	3	0	3	1.5	7504.1809	0.0005
4	0	4	4.5	3	0	3	4.5	7510.0064	-0.0008
4	1	3	3.5	3	1	2	3.5	7905.9512	-0.0009
4	1	3	5.5	3	1	2	4.5	7912.6961	0.0008
4	1	3	4.5	3	1	2	3.5	7913.3821	0.0001
4	1	3	2.5	3	1	2	1.5	7914.8243	0.0008
4	1	3	3.5	3	1	2	2.5	7915.5196	0.0005
4	1	3	4.5	3	1	2	4.5	7933.8547	0.0014
5	1	5	5.5	4	1	4	5.5	8972.2004	-0.0051
5	1	5	3.5	4	1	4	2.5	8976.8083	-0.0004
5	1	5	4.5	4	1	4	3.5	8976.9681	-0.0007
5	1	5	6.5	4	1	4	5.5	8977.2177	-0.0007
5	1	5	5.5	4	1	4	4.5	8977.3690	-0.0007
5	1	5	4.5	4	1	4	4.5	8978.7927	0.0009
5	1	5	3.5	4	1	4	3.5	8982.0159	0.0028
3	1	3	3.5	2	0	2	2.5	9061.0909	0.0001
3	1	3	2.5	2	0	2	2.5	9063.8539	-0.0015
3	1	3	3.5	2	0	2	3.5	9070.4367	0.0012
3	1	3	2.5	2	0	2	1.5	9070.5045	-0.0004
3	1	3	4.5	2	0	2	3.5	9076.3144	0.0028
3	1	3	1.5	2	0	2	1.5	9076.4363	0.0016
3	1	3	1.5	2	0	2	0.5	9085.8015	-0.0003

Table S8: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-H^{13}CCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
5	0	5	3.5	4	0	4	3.5	9327.0359	0.0003
5	0	5	4.5	4	0	4	4.5	9330.3059	-0.0008
5	0	5	5.5	4	0	4	4.5	9331.9015	-0.0002
5	0	5	4.5	4	0	4	3.5	9332.8256	-0.0002
5	0	5	6.5	4	0	4	5.5	9333.3628	-0.0002
5	0	5	3.5	4	0	4	2.5	9334.2736	-0.0007
5	0	5	5.5	4	0	4	5.5	9339.1226	-0.0002
5	1	4	3.5	4	1	3	3.5	9858.9352	-0.0006
5	1	4	4.5	4	1	3	4.5	9872.7220	0.0001
5	1	4	6.5	4	1	3	5.5	9878.6379	0.0003
5	1	4	5.5	4	1	3	4.5	9878.7223	-0.0003
5	1	4	3.5	4	1	3	2.5	9880.0606	-0.0001
5	1	4	4.5	4	1	3	3.5	9880.1515	-0.0001
5	1	4	5.5	4	1	3	5.5	9899.8805	-0.0001
7	0	7	5.5	6	1	6	4.5	10528.5142	0.0003
7	0	7	8.5	6	1	6	7.5	10530.2573	0.0006
7	0	7	6.5	6	1	6	5.5	10536.0374	0.0011
7	0	7	7.5	6	1	6	6.5	10537.6955	0.0006
4	1	4	4.5	3	0	3	3.5	10604.6966	-0.0001
4	1	4	3.5	3	0	3	3.5	10606.5187	-0.0010
4	1	4	3.5	3	0	3	2.5	10610.4342	-0.0007
4	1	4	4.5	3	0	3	4.5	10613.1233	0.0002
4	1	4	2.5	3	0	3	2.5	10615.6376	-0.0016
4	1	4	5.5	3	0	3	4.5	10618.2889	0.0016
4	1	4	2.5	3	0	3	1.5	10624.0802	-0.0014
6	1	6	5.5	5	1	5	4.5	10757.0491	-0.0001
6	1	6	4.5	5	1	5	3.5	10757.1570	0.0004
6	1	6	6.5	5	1	5	5.5	10757.2532	-0.0004
6	1	6	7.5	5	1	5	6.5	10757.3668	0.0002
4	2	2	5.5	4	1	3	4.5	10999.7290	0.0039
4	2	2	3.5	4	1	3	4.5	11004.0017	0.0001
4	2	2	2.5	4	1	3	3.5	11004.8803	-0.0018
4	2	2	4.5	4	1	3	4.5	11006.3124	0.0000
4	2	2	3.5	4	1	3	3.5	11011.4307	-0.0008
4	2	2	4.5	4	1	3	3.5	11013.7433	0.0010
4	2	2	5.5	4	1	3	5.5	11020.8854	0.0023
4	2	2	2.5	4	1	3	2.5	11026.0060	-0.0009
4	2	2	4.5	4	1	3	5.5	11027.4692	-0.0012
4	2	2	3.5	4	1	3	2.5	11032.5551	-0.0012
6	0	6	6.5	5	0	5	5.5	11134.7623	-0.0003
6	0	6	5.5	5	0	5	4.5	11135.4125	-0.0005
6	0	6	7.5	5	0	5	6.5	11136.4249	0.0002
6	0	6	4.5	5	0	5	3.5	11137.0670	-0.0005

Table S8: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-H^{13}CCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
6	1	5	6.5	5	1	4	5.5	11834.8852	0.0005
6	1	5	7.5	5	1	4	6.5	11835.1230	0.0008
6	1	5	5.5	5	1	4	4.5	11835.9128	0.0003
6	1	5	4.5	5	1	4	3.5	11836.1467	0.0010
5	1	5	5.5	4	0	4	4.5	12080.4862	0.0005
5	1	5	4.5	4	0	4	4.5	12081.9073	-0.0005
5	1	5	4.5	4	0	4	3.5	12084.4269	0.0000
2	2	1	3.5	2	1	2	3.5	12087.4456	0.0043
5	1	5	5.5	4	0	4	5.5	12087.7087	0.0020
5	1	5	3.5	4	0	4	3.5	12089.4720	0.0007
5	1	5	6.5	4	0	4	5.5	12092.7219	0.0024
2	2	1	1.5	2	1	2	2.5	12092.7672	-0.0035
5	1	5	3.5	4	0	4	2.5	12096.7098	-0.0001
2	2	1	0.5	2	1	2	1.5	12096.8461	-0.0013
7	1	7	6.5	6	1	6	5.5	12529.8554	0.0006
7	1	7	7.5	6	1	6	6.5	12529.9709	-0.0002
7	1	7	5.5	6	1	6	4.5	12530.1111	0.0004
7	1	7	8.5	6	1	6	7.5	12530.2311	0.0003
4	2	3	2.5	4	1	4	2.5	12724.9650	-0.0014
4	2	3	5.5	4	1	4	5.5	12728.1584	0.0011
4	2	3	3.5	4	1	4	2.5	12728.8039	0.0028
4	2	3	2.5	4	1	4	3.5	12730.1685	-0.0023
4	2	3	4.5	4	1	4	5.5	12732.0046	-0.0001
4	2	3	5.5	4	1	4	4.5	12733.3236	0.0021
4	2	3	3.5	4	1	4	3.5	12734.0053	-0.0003
4	2	3	4.5	4	1	4	3.5	12735.3472	0.0014
4	2	3	3.5	4	1	4	4.5	12735.8262	-0.0024
4	2	3	4.5	4	1	4	4.5	12737.1681	-0.0007
7	0	7	6.5	6	0	6	5.5	12909.2741	0.0004
7	0	7	8.5	6	0	6	7.5	12910.5533	-0.0021
7	2	6	7.5	6	2	5	6.5	13188.7344	-0.0012
7	2	6	6.5	6	2	5	5.5	13188.9029	0.0008
5	2	4	4.5	5	1	5	4.5	13199.4316	0.0007
5	2	4	5.5	5	1	5	5.5	13202.4162	-0.0018
6	1	6	6.5	5	0	5	5.5	13505.8378	0.0002
6	1	6	5.5	5	0	5	4.5	13508.6500	-0.0003
6	1	6	7.5	5	0	5	6.5	13516.7250	0.0017
6	1	6	4.5	5	0	5	3.5	13519.5918	-0.0004
7	1	6	7.5	6	1	5	6.5	13779.1545	-0.0005
7	1	6	8.5	6	1	5	7.5	13779.6187	-0.0002
7	1	6	6.5	6	1	5	5.5	13779.9369	-0.0008
7	1	6	5.5	6	1	5	4.5	13780.3979	-0.0002
7	1	7	7.5	6	0	6	6.5	14901.0466	0.0004

Table S8: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{35}ClCHF-H^{13}CCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
7	1	7	6.5	6	0	6	5.5	14903.0922	0.0000
7	1	7	8.5	6	0	6	7.5	14910.5304	0.0010
7	1	7	5.5	6	0	6	4.5	14912.6352	-0.0003
2	2	1	1.5	1	1	0	1.5	15500.7982	-0.0026
2	2	1	2.5	1	1	0	2.5	15501.8743	-0.0009
2	2	1	1.5	1	1	0	2.5	15508.9814	-0.0053
2	2	1	0.5	1	1	0	1.5	15510.7697	-0.0015
2	2	1	3.5	1	1	0	2.5	15511.8249	0.0040
2	2	1	1.5	1	1	0	0.5	15515.5885	0.0017
2	2	1	0.5	1	1	0	0.5	15525.5562	-0.0011
2	2	0	1.5	1	1	1	0.5	15676.3660	0.0040
2	2	0	2.5	1	1	1	2.5	15684.2455	-0.0023
2	2	0	0.5	1	1	1	0.5	15685.7302	0.0010
2	2	0	1.5	1	1	1	2.5	15690.9074	-0.0055
2	2	0	3.5	1	1	1	2.5	15693.5819	0.0033
2	2	0	2.5	1	1	1	1.5	15702.4031	0.0030
2	2	0	1.5	1	1	1	1.5	15709.0636	-0.0017
2	2	0	0.5	1	1	1	1.5	15718.4330	0.0005
8	1	8	8.5	7	0	7	7.5	16287.3929	-0.0008
8	1	8	7.5	7	0	7	6.5	16288.8640	-0.0004
8	1	8	9.5	7	0	7	8.5	16295.4389	-0.0006
8	1	8	6.5	7	0	7	5.5	16296.9886	0.0004
3	2	2	3.5	2	1	1	2.5	17204.4907	0.0012
3	2	2	2.5	2	1	1	1.5	17217.4888	-0.0025
3	2	2	4.5	2	1	1	3.5	17222.6550	0.0049
3	2	2	1.5	2	1	1	0.5	17235.6302	0.0004
3	2	1	1.5	2	1	2	0.5	17782.0569	0.0011
3	2	1	4.5	2	1	2	3.5	17788.6744	0.0023
3	2	1	3.5	2	1	2	3.5	17790.2284	0.0007
3	2	1	1.5	2	1	2	1.5	17790.2828	0.0007
3	2	1	2.5	2	1	2	1.5	17791.7767	-0.0008
3	2	1	2.5	2	1	2	2.5	17797.6701	-0.0012
3	2	1	3.5	2	1	2	2.5	17798.3912	-0.0002
4	2	3	3.5	3	1	2	3.5	18823.6129	-0.0020
4	2	3	4.5	3	1	2	3.5	18824.9555	0.0002
4	2	3	3.5	3	1	2	2.5	18833.1797	-0.0021
4	2	3	5.5	3	1	2	4.5	18841.5826	0.0034
4	2	3	2.5	3	1	2	1.5	18849.7745	-0.0019
5	3	2	5.5	5	2	3	5.5	19527.7033	-0.0005
5	3	2	4.5	5	2	3	4.5	19529.9535	-0.0015
5	3	2	6.5	5	2	3	6.5	19535.7031	0.0030
5	3	2	3.5	5	2	3	3.5	19537.9539	-0.0012

Table S9: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{37}ClCHF-H^{13}CCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
1	1	1	1.5	0	0	0	1.5	5580.1081	-0.0017
1	1	1	2.5	0	0	0	1.5	5594.4212	0.0013
1	1	1	0.5	0	0	0	1.5	5605.8841	-0.0021
4	1	4	2.5	3	1	3	1.5	7157.4714	-0.0008
4	1	4	3.5	3	1	3	2.5	7158.0311	0.0005
4	1	4	5.5	3	1	3	4.5	7158.2197	0.0012
4	1	4	4.5	3	1	3	3.5	7158.7679	-0.0005
2	1	2	2.5	1	0	1	1.5	7280.9056	-0.0007
2	1	2	1.5	1	0	1	1.5	7285.5455	0.0000
2	1	2	2.5	1	0	1	2.5	7288.7593	-0.0009
2	1	2	3.5	1	0	1	2.5	7295.2026	0.0024
2	1	2	1.5	1	0	1	0.5	7299.6741	0.0005
2	1	2	0.5	1	0	1	0.5	7306.1522	-0.0008
4	0	4	4.5	3	0	3	3.5	7473.8507	0.0002
4	0	4	5.5	3	0	3	4.5	7474.8566	0.0000
4	0	4	3.5	3	0	3	2.5	7474.9626	0.0002
4	0	4	2.5	3	0	3	1.5	7475.9663	-0.0011
4	1	3	5.5	3	1	2	4.5	7897.7040	0.0010
4	1	3	4.5	3	1	2	3.5	7898.2294	0.0007
4	1	3	2.5	3	1	2	1.5	7899.3871	0.0017
4	1	3	3.5	3	1	2	2.5	7899.9169	0.0001
3	1	3	3.5	2	0	2	2.5	8893.6200	0.0000
3	1	3	2.5	2	0	2	2.5	8895.7998	-0.0009
3	1	3	3.5	2	0	2	3.5	8900.9595	0.0023
3	1	3	2.5	2	0	2	1.5	8901.0247	-0.0010
3	1	3	4.5	2	0	2	3.5	8905.6022	0.0020
3	1	3	1.5	2	0	2	1.5	8905.7029	0.0005
3	1	3	1.5	2	0	2	0.5	8913.0538	-0.0002
5	1	5	3.5	4	1	4	2.5	8935.7486	-0.0006
5	1	5	4.5	4	1	4	3.5	8935.8594	-0.0003
5	1	5	6.5	4	1	4	5.5	8936.0675	0.0000
5	1	5	5.5	4	1	4	4.5	8936.1716	-0.0010
5	0	5	5.5	4	0	4	4.5	9293.5073	-0.0007
5	0	5	4.5	4	0	4	3.5	9294.2405	-0.0004
5	0	5	6.5	4	0	4	5.5	9294.7231	-0.0001
5	0	5	3.5	4	0	4	2.5	9295.4483	0.0001
5	1	4	6.5	4	1	3	5.5	9858.6168	-0.0003
5	1	4	5.5	4	1	3	4.5	9858.6639	0.0014
5	1	4	3.5	4	1	3	2.5	9859.7438	0.0000
5	1	4	4.5	4	1	3	3.5	9859.7930	0.0002
4	1	4	4.5	3	0	3	3.5	10423.7835	0.0004
4	1	4	3.5	3	0	3	3.5	10425.2252	-0.0008
4	1	4	3.5	3	0	3	2.5	10428.2802	-0.0008

Table S9: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{37}ClCHF-H^{13}CCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
4	1	4	4.5	3	0	3	4.5	10430.3528	-0.0001
4	1	4	2.5	3	0	3	2.5	10432.3965	-0.0027
4	1	4	5.5	3	0	3	4.5	10434.4484	0.0025
4	1	4	2.5	3	0	3	1.5	10438.9787	-0.0006
4	2	2	4.5	4	1	3	4.5	10575.7081	-0.0006
4	2	2	3.5	4	1	3	3.5	10579.6905	0.0009
4	2	2	5.5	4	1	3	5.5	10587.0472	0.0024
4	2	2	2.5	4	1	3	2.5	10591.0286	-0.0003
7	0	7	5.5	6	1	6	4.5	10621.3932	0.0016
7	0	7	8.5	6	1	6	7.5	10622.7107	0.0017
7	0	7	6.5	6	1	6	5.5	10627.0582	0.0016
7	0	7	7.5	6	1	6	6.5	10628.3146	-0.0007
6	1	6	5.5	5	1	5	4.5	10706.5280	-0.0002
6	1	6	4.5	5	1	5	3.5	10706.6278	-0.0018
6	1	6	6.5	5	1	5	5.5	10706.6867	-0.0001
6	1	6	7.5	5	1	5	6.5	10706.7910	-0.0007
6	0	6	6.5	5	0	5	5.5	11083.8207	-0.0010
6	0	6	5.5	5	0	5	4.5	11084.3436	-0.0006
6	0	6	7.5	5	0	5	6.5	11085.1946	-0.0005
6	0	6	4.5	5	0	5	3.5	11085.7101	-0.0007
6	1	5	6.5	5	1	4	5.5	11809.0053	0.0003
6	1	5	7.5	5	1	4	6.5	11809.2213	0.0004
6	1	5	5.5	5	1	4	4.5	11809.8195	0.0000
6	1	5	4.5	5	1	4	3.5	11810.0332	0.0006
5	1	5	5.5	4	0	4	4.5	11886.1062	0.0009
5	1	5	4.5	4	0	4	3.5	11889.1786	0.0004
5	1	5	6.5	4	0	4	5.5	11895.6584	0.0015
5	1	5	3.5	4	0	4	2.5	11898.7612	0.0001
4	2	3	2.5	4	1	4	2.5	12328.4366	-0.0006
4	2	3	5.5	4	1	4	5.5	12330.9558	0.0027
4	2	3	3.5	4	1	4	3.5	12335.5700	-0.0034
4	2	3	4.5	4	1	4	4.5	12338.0697	-0.0011
7	1	7	6.5	6	1	6	5.5	12469.4440	-0.0003
7	1	7	7.5	6	1	6	6.5	12469.5342	0.0001
7	1	7	5.5	6	1	6	4.5	12469.6627	-0.0002
7	1	7	8.5	6	1	6	7.5	12469.7549	-0.0002
7	0	7	7.5	6	0	6	6.5	12843.7766	-0.0011
7	0	7	6.5	6	0	6	5.5	12844.1765	-0.0013
7	0	7	8.5	6	0	6	7.5	12845.2384	-0.0010
6	1	6	6.5	5	0	5	5.5	13299.2843	0.0002
6	1	6	5.5	5	0	5	4.5	13301.4654	-0.0001
6	1	6	7.5	5	0	5	6.5	13307.7273	0.0018
6	1	6	4.5	5	0	5	3.5	13309.9425	0.0001

Table S9: Observed Transition Frequencies (in MHz) for (*Z*)-CH^{37}ClCHF-H^{13}CCH

J'	K_a'	K_c'	F'	J''	K_a''	K_c''	F''	Observed	Obs - Calc
7	1	6	7.5	6	1	5	6.5	13746.2747	-0.0007
7	1	6	8.5	6	1	5	7.5	13746.6774	-0.0002
7	1	6	6.5	6	1	5	5.5	13746.8977	0.0007
7	1	6	5.5	6	1	5	4.5	13747.2962	-0.0009
7	1	7	7.5	6	0	6	6.5	14684.9960	-0.0005
7	1	7	6.5	6	0	6	5.5	14686.5637	-0.0019
7	1	7	8.5	6	0	6	7.5	14692.2858	0.0004
7	1	7	5.5	6	0	6	4.5	14693.8925	-0.0020
2	2	1	2.5	1	1	0	1.5	15062.8552	-0.0005
2	2	1	1.5	1	1	0	1.5	15068.4601	-0.0027
2	2	1	2.5	1	1	0	2.5	15069.3083	-0.0014
2	2	1	3.5	1	1	0	2.5	15077.1554	0.0026
2	2	1	1.5	1	1	0	0.5	15080.1146	0.0024
2	2	1	0.5	1	1	0	0.5	15087.9680	-0.0026
2	2	0	1.5	1	1	1	0.5	15251.3376	0.0029
2	2	0	2.5	1	1	1	2.5	15257.5652	-0.0010
2	2	0	0.5	1	1	1	0.5	15258.6859	-0.0004
2	2	0	3.5	1	1	1	2.5	15264.8973	0.0022
2	2	0	2.5	1	1	1	1.5	15271.8774	0.0011
2	2	0	1.5	1	1	1	1.5	15277.1084	-0.0027
8	1	8	8.5	7	0	7	7.5	16065.5737	0.0000
8	1	8	9.5	7	0	7	8.5	16071.6947	0.0036
3	2	2	3.5	2	1	1	2.5	16763.5700	0.0001
3	2	2	2.5	2	1	1	1.5	16773.8132	-0.0010
3	2	2	4.5	2	1	1	3.5	16777.8891	0.0037
3	2	2	1.5	2	1	1	0.5	16788.1143	-0.0010
3	2	1	1.5	2	1	2	0.5	17355.9097	-0.0036
3	2	1	4.5	2	1	2	3.5	17361.1580	0.0004
3	2	1	2.5	2	1	2	1.5	17363.6535	0.0027
3	2	1	3.5	2	1	2	2.5	17368.8923	-0.0005
5	3	2	5.5	5	2	3	5.5	18815.2618	-0.0021
5	3	2	4.5	5	2	3	4.5	18817.0788	0.0017
5	3	2	6.5	5	2	3	6.5	18821.7044	0.0024
5	3	2	3.5	5	2	3	3.5	18823.5154	-0.0021