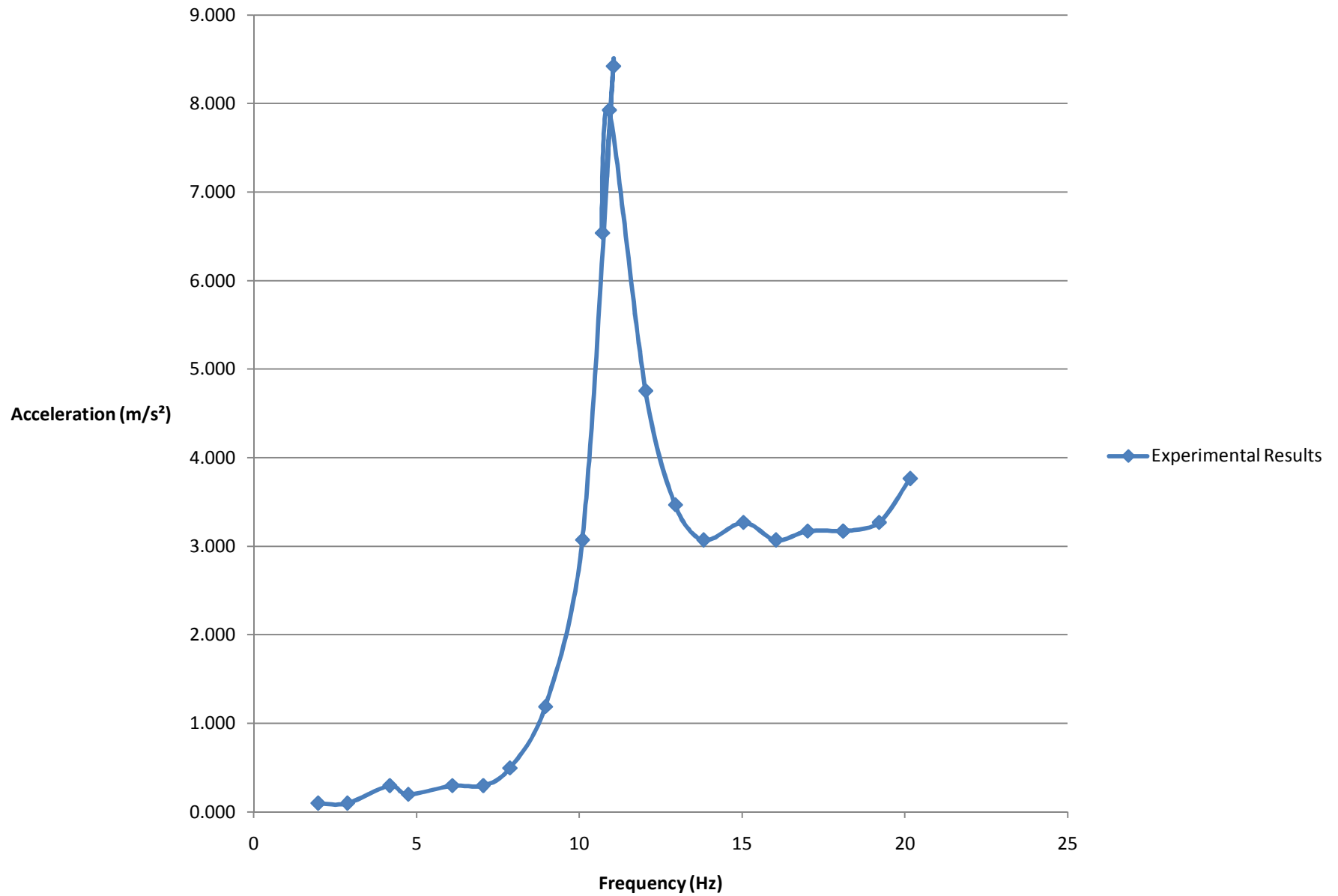


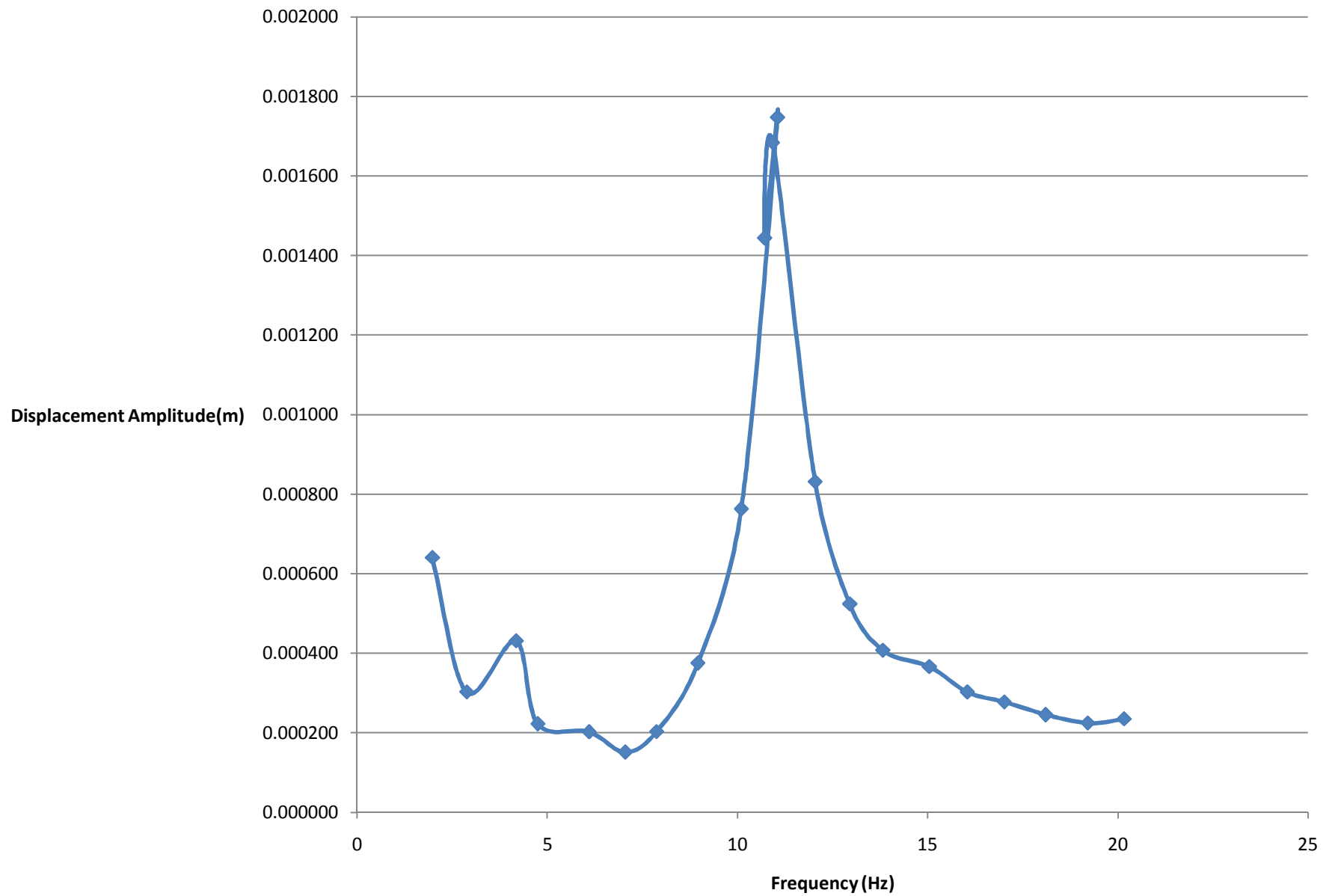
In Phase														
$\omega$	Frequency (Hz)	Frequency( $\omega$ )	Rad/s	r	Acceleration Amplitude (V)	Acceleration (m/s <sup>2</sup> )	Displacement Amplitude(m)	Phase Lead of Acceleration(degrees)	phi experimental	Time Shift	phi	Phi	Y	theoretical Y/ measured y
	20.16		126.67	1.81	0.038	3.765	0.000235	4.5	175.5	0.049	176.8038702	175.5	0.00023266	1.43434768
	19.21		120.70	1.73	0.033	3.270	0.000224	4.5	175.5	0.051	176.4912689	175.5	0.00024336	1.50027451
	18.1		113.73	1.63	0.032	3.171	0.000245	5.6	174.4	0.054	176.0245904	174.4	0.00025975	1.60131476
	18.1		113.73	1.63	0.032	3.171	0.000245	5.6	174.4	0.054	176.0245904	174.4	0.00025975	1.60131476
	17.01		106.88	1.53	0.032	3.171	0.000278	7.4	172.6	0.058	175.4042731	172.6	0.00028212	1.73923193
	16.04		100.78	1.44	0.031	3.072	0.000302	6.7	173.3	0.061	174.63196	173.3	0.00031062	1.91491423
	15.04		94.50	1.35	0.033	3.270	0.000366	9.2	170.8	0.065	173.452592	170.8	0.00035499	2.18844877
	13.82		86.83	1.24	0.031	3.072	0.000407	9.7	170.3	0.07	170.8821715	170.3	0.00045332	2.79466426
	12.95		81.37	1.17	0.035	3.468	0.000524	15.1	164.9	0.074	167.0660559	164.9	0.00059999	3.69888413
	12.04		75.65	1.08	0.048	4.756	0.000831	27.9	152.1	0.077	156.2548705	152.1	0.00100355	6.18674123
	10.92		68.61	0.98	0.08	7.927	0.001684	99.8	80.2	0.066	63.49341884	80.2	0.00202279	12.470284
	10.71		67.29	0.96	0.066	6.540	0.001444	123.3	56.7	0.061	43.61034589	56.7	0.00152913	9.42689703
	11.05		69.43	0.99	0.085	8.423	0.001747	82.4	97.6	0.07	80.74101519	97.6	0.00225751	13.9172725
	10.1		63.46	0.91	0.031	3.072	0.000763	161.5	18.5	0.055	20.20636842	18.5	0.00072212	4.4517858
	8.96		56.30	0.81	0.012	1.189	0.000375	174.8	5.2	0.057	9.224804747	5.2	0.00029732	1.83295597
	7.87		49.45	0.71	0.005	0.495	0.000203	178.4	1.6	0.064	5.719315123	1.6	0.00016234	1.000834
	7.05		44.30	0.63	0.003	0.297	0.000152	474.9	-294.9	-0.045	4.280461117	-294.9	0.00010892	0.67149128
	6.1		38.33	0.55	0.003	0.297	0.000202	1264.5	-1084.5	-0.412	3.170224391	-1085	6.9829E-05	0.43048991
	4.75		29.85	0.43	0.002	0.198	0.000222	1754	-1574	-0.815	2.111634929	-1574	3.6229E-05	0.22334637
	4.18		26.26	0.38	0.003	0.297	0.000431	-95.7	275.7	0.303	1.769280381	275.7	2.6714E-05	0.16469055
	2.88		18.10	0.26	0.001	0.099	0.000303	2099	-1919	-1.679	1.122135643	-1919	1.1675E-05	0.07197387
	1.98		12.44	0.18	0.001	0.099	0.000640	847.7	-667.7	-0.685	0.743306051	-667.7	5.3169E-06	0.03277823

Calibration		99 mV/g
		0.099 V/g
e		0.04 m
k		18277 N/m
Keq		73108 N/m
m		0.0152 Kg
M		14.993 Kg
$\omega_n$		69.8293792 rad/s
$\omega_d$		69.785969 rad/s
u		0.000162209 m
Ai		0.06721 V
g		9.81 m/s <sup>2</sup>
af		0.03458 V
del		0.221515522 unitless
zeta		0.03525529 unitless

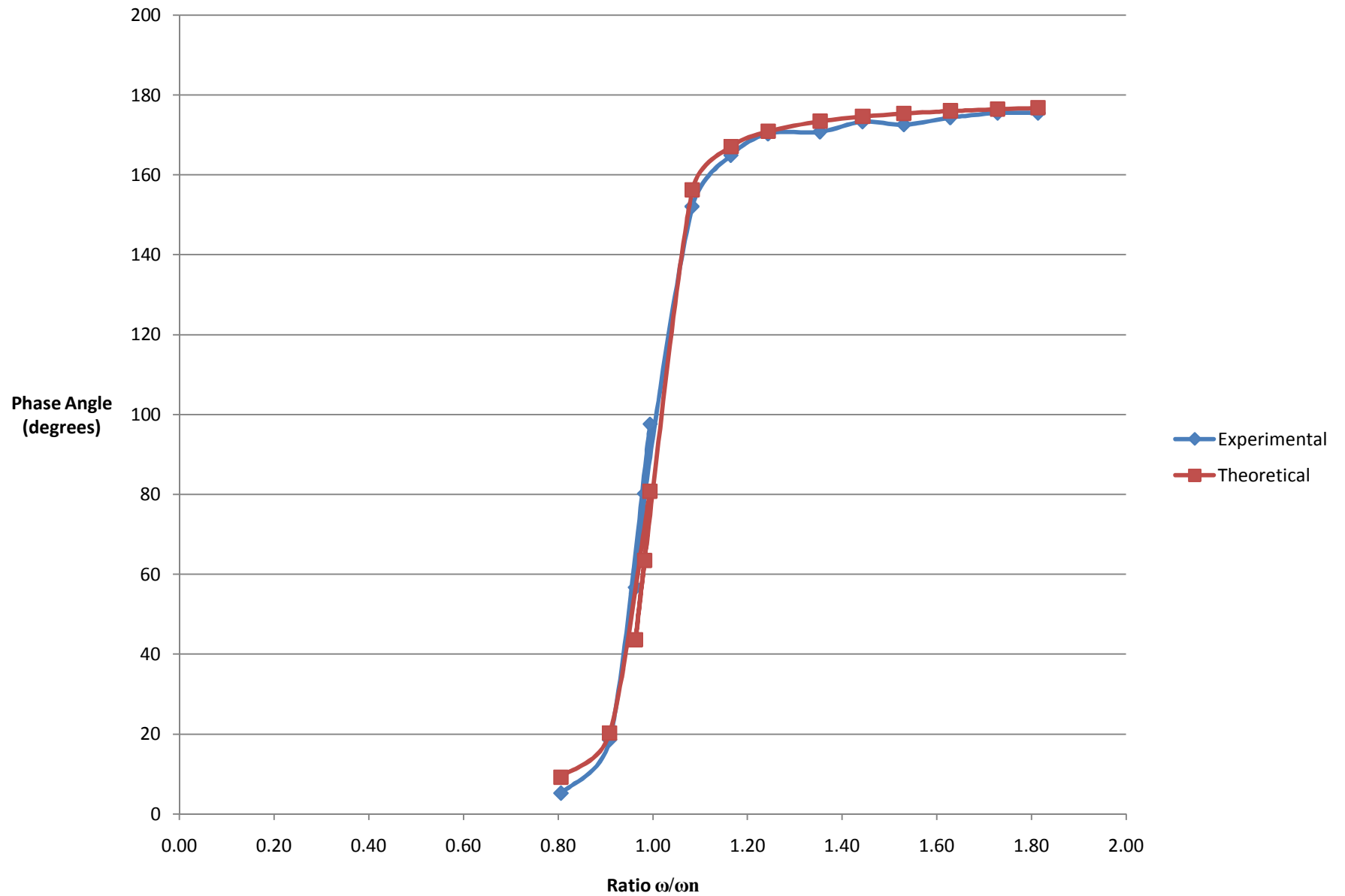
**Acceleration vs. Frequency for In Phase Configuration**



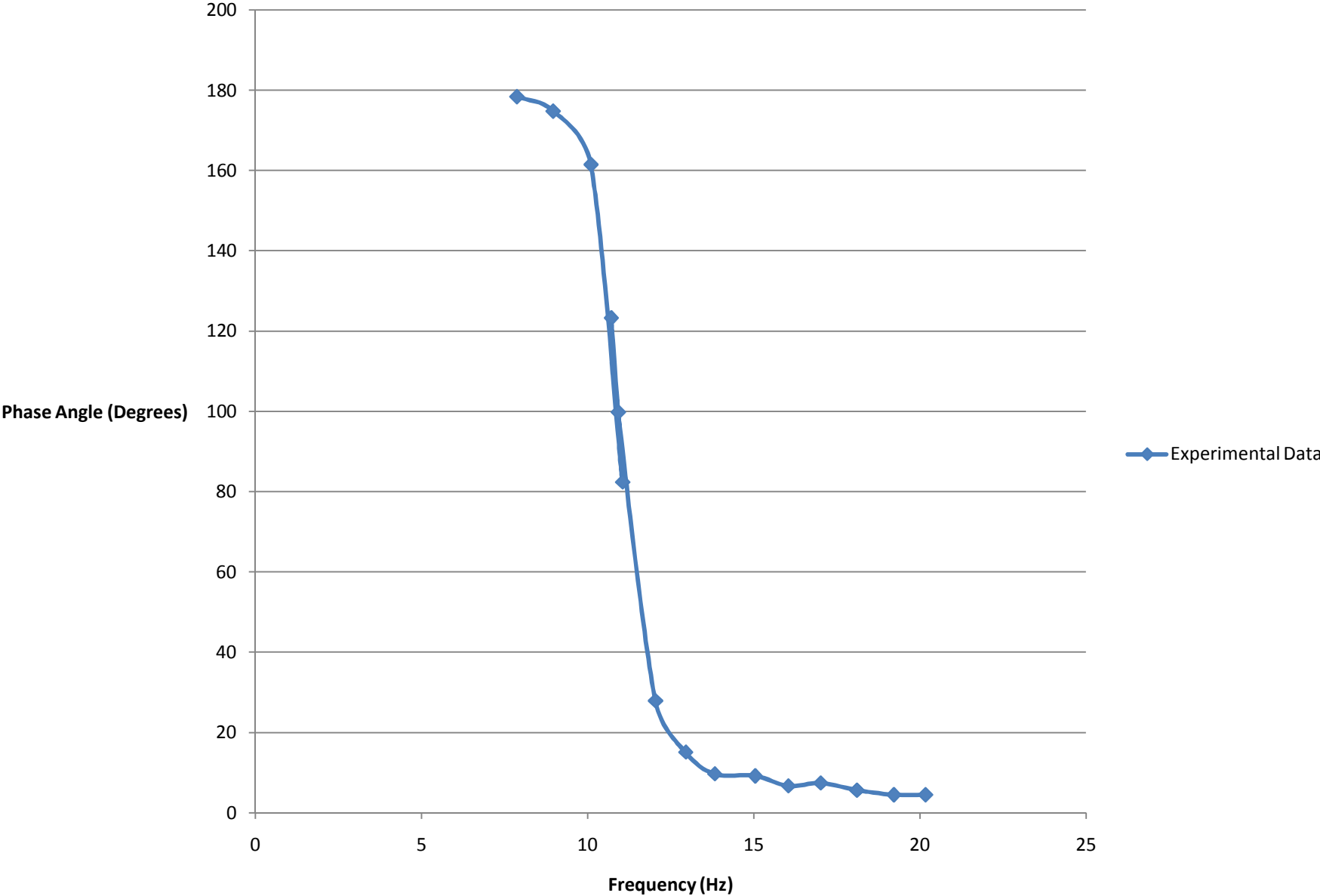
**Displacement Amplitude vs Frequency**



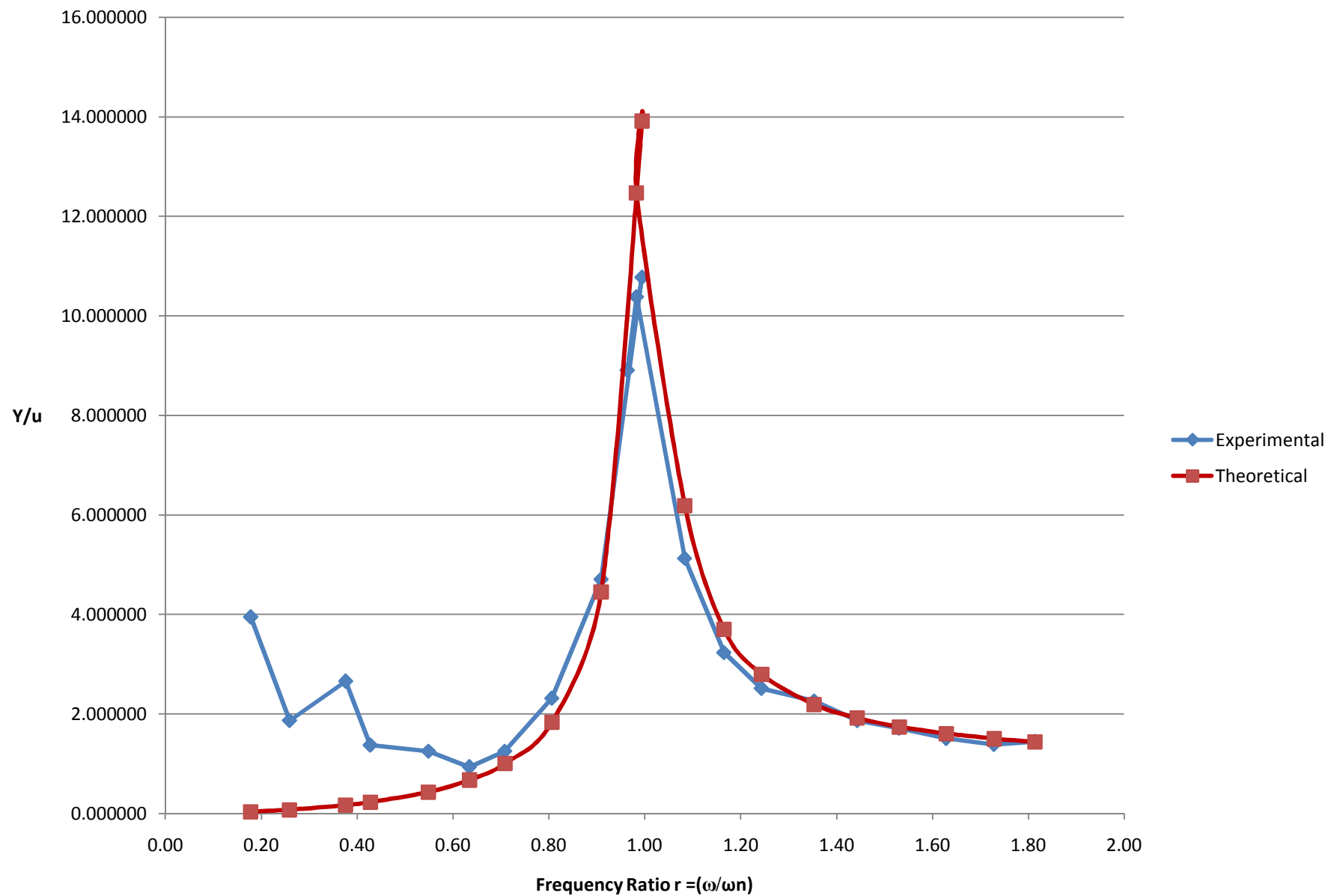
# Phase Angles vs. Frequency Ratio



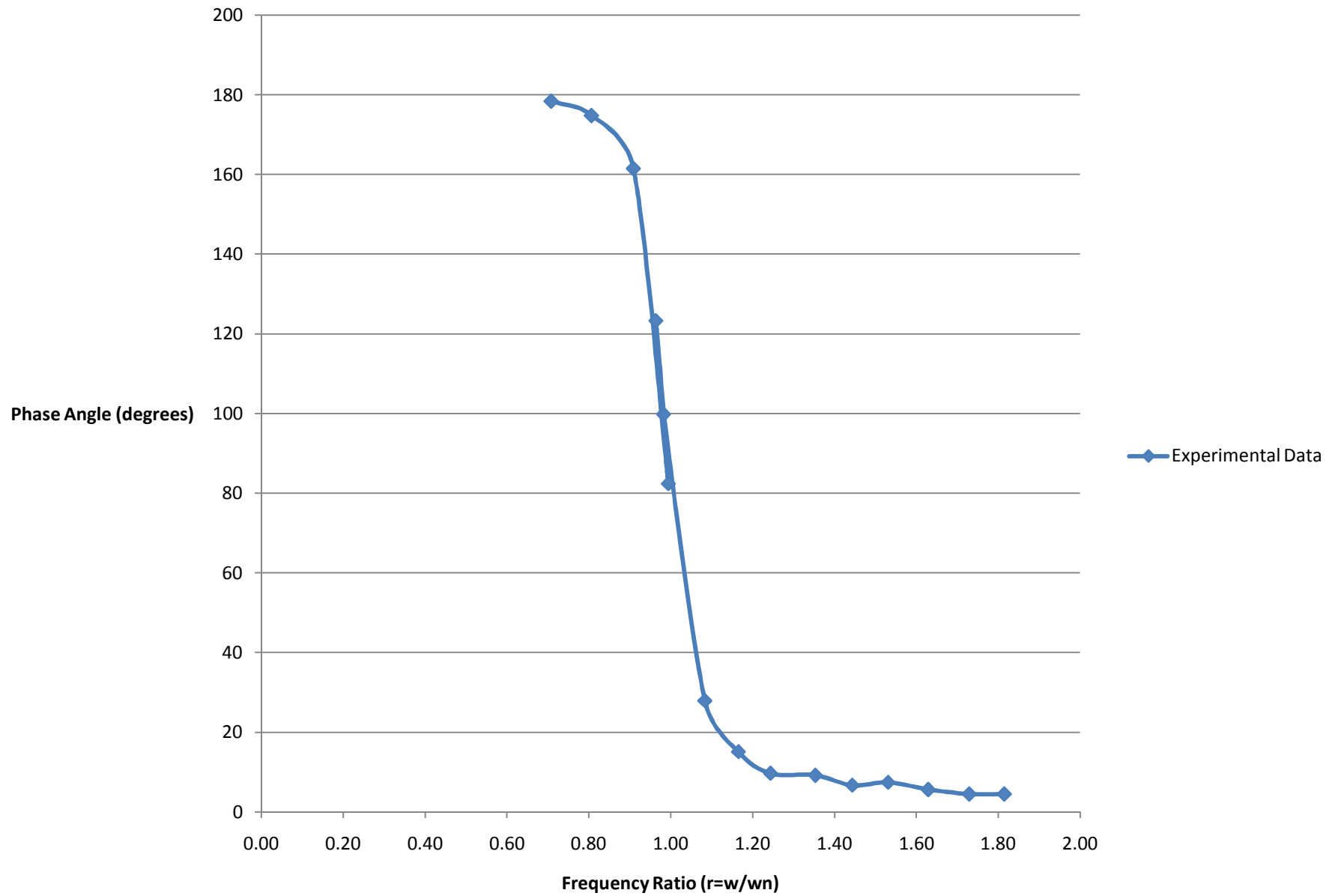
Phase Angle vs. Frequency



# Non-Dimensional Amplitude versus Frequency Ratio



# Phase Angle vs. Frequency Ratio



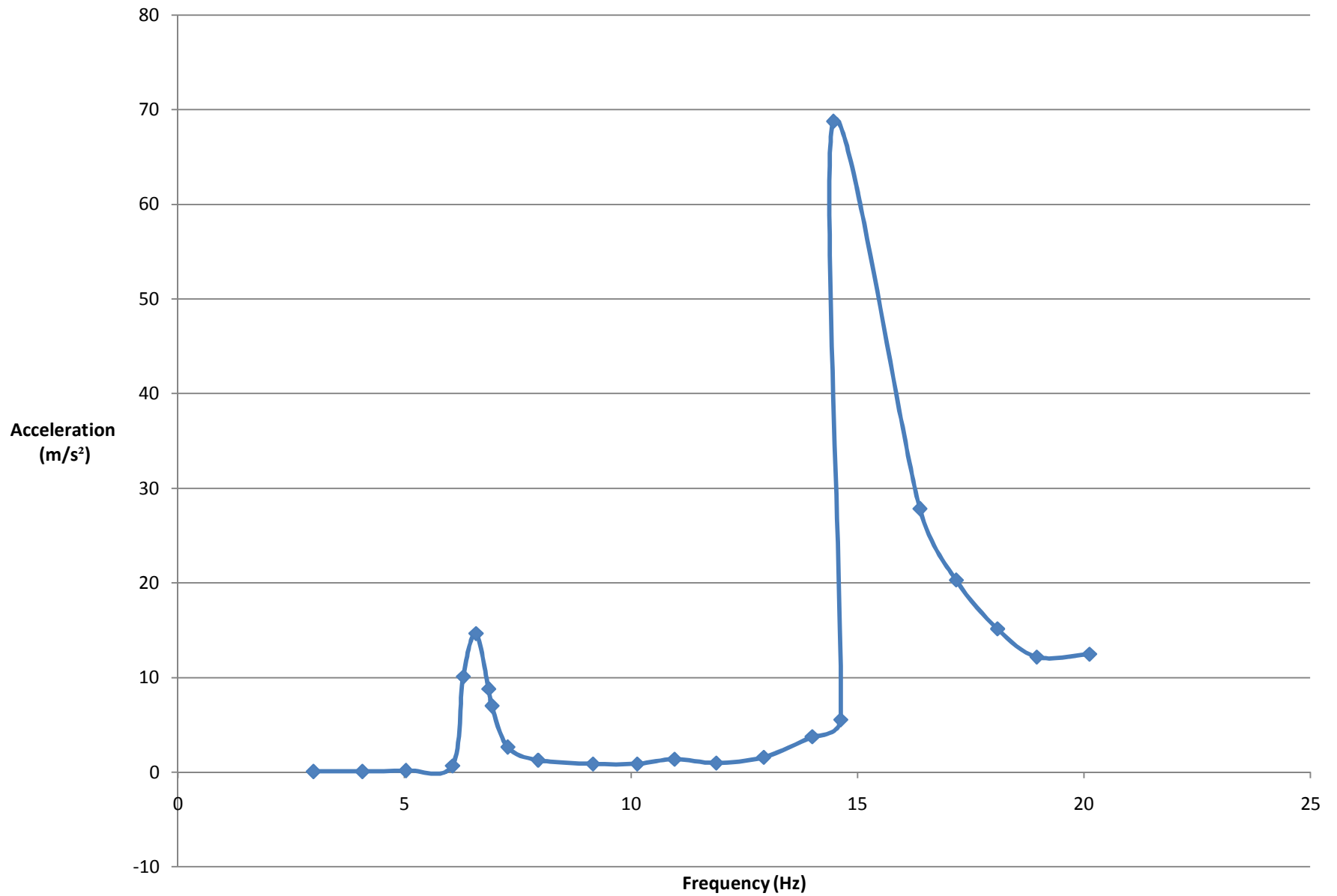
Frequency (Hz)	Frequency(rad/s)	Acceleration Amplitude (V)	Acceleration (m/s <sup>2</sup> )	Phase Lead of Acceleration	Time Shift
20.12	126.4176884	0.126	12.48545455	186.1	0.024
18.96	119.1291934	0.123	12.18818182	186.6	0.025
18.09	113.6628222	0.153	15.16090909	188	0.026
17.18	107.9451236	0.205	20.31363636	191.8	0.027
16.38	102.9185753	0.281	27.84454545	198.5	0.027
14.47	90.91769139	0.694	68.76909091	276.7	0.016
14.63	91.92300104	0.056	5.549090909	350.5	0.002
14	87.9645943	0.038	3.765454545	358	0
12.93	81.24158602	0.016	1.585454545	358.1	0
11.88	74.64424145	0.01	0.990909091	2.5	0.084
10.96	68.86371097	0.014	1.387272727	97.9	0.066
10.14	63.71149901	0.009	0.891818182	169.5	0.052
9.16	57.55397741	0.009	0.891818182	181.9	0.054
7.95	49.95132319	0.013	1.288181818	187	0.06
7.28	45.74158904	0.027	2.675454545	190.7	0.065
6.93	43.54247418	0.071	7.035454545	195.6	0.066
6.86	43.10265121	0.089	8.819090909	204.2	0.063
6.58	41.34335932	0.148	14.66545455	288.2	0.03
6.3	39.58406744	0.102	10.10727273	456.2	-0.042
6.06	38.07610296	0.007	0.693636364	6.6	0.162
5.03	31.6044221	0.002	0.198181818	15.7	0.19
4.07	25.5725642	0.001	0.099090909	799.2	-0.299
2.99	18.78672407	0.001	0.099090909	599.4	-0.222

Calibration

99 mV/g  
0.099 V/g



**Acceleration vs. Frequency for Out of Phase Configuration**



Phase Angle vs Rotation Speed

