	ENGINEERING REPORT GOODMORNING.COM THIRD PARTY MATTRESS TESTING	**DOCUMENT: P-055-05** **REVISION:** 0 **CREATED BY:** WS

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DATE: October 1, 2022

RE: **THIRD PARTY MATTRESS TESTING**

INTRODUCTION

In September 2022, GoodMorning.com commissioned Techtree to provide independent 3rd party testing of multiple mattresses. Similar testing was done previously by Rus-Tec (5055-1,-2,-3,-4,-5,-6,-7,-8) and Pure Mosaic (PMTM-4211-01 and PMTM-4320-01). Data from all test runs are represented in this document, as provided by GoodMorning.com from the previously validated reports. Techtree followed testing procedures as directed by GoodMorning.com and attached in Appendix B. Below follows an overview of the testing procedures used as well as the results that they produced. Additional results can be found in Appendix A.

REFERENCE LOADS & TEST INFORMATION

Figure 1: Reference Load 1. Plastic 5 gallon water cooler bottle. Size: 10.75" diameter, 19.5" height, 42.3 lb weight

Figure 2: Reference Load 2. Spherical medicine ball. Size: 9" diameter, 10 lb weight

As specified by the testing methodology, all testing was completed in a room with a temperature range between 18°C and 25°C and a humidity range between 25% to 50%, in order to simulate the environment of a typical residence. Mattresses were placed on a drop cloth on a flat concrete floor such that the top and sides were unobstructed.

TEST 1 – MATTRESS FIRMNESS

Overview and Objective: Apply Reference Load 1 to the center of each subject mattress and measure the vertical displacement of each to establish their respective positions on a firmness (or "sinkage") scale. A low relative vertical displacement shall indicate a firmer mattress, while a high relative vertical displacement shall indicate a softer mattress.

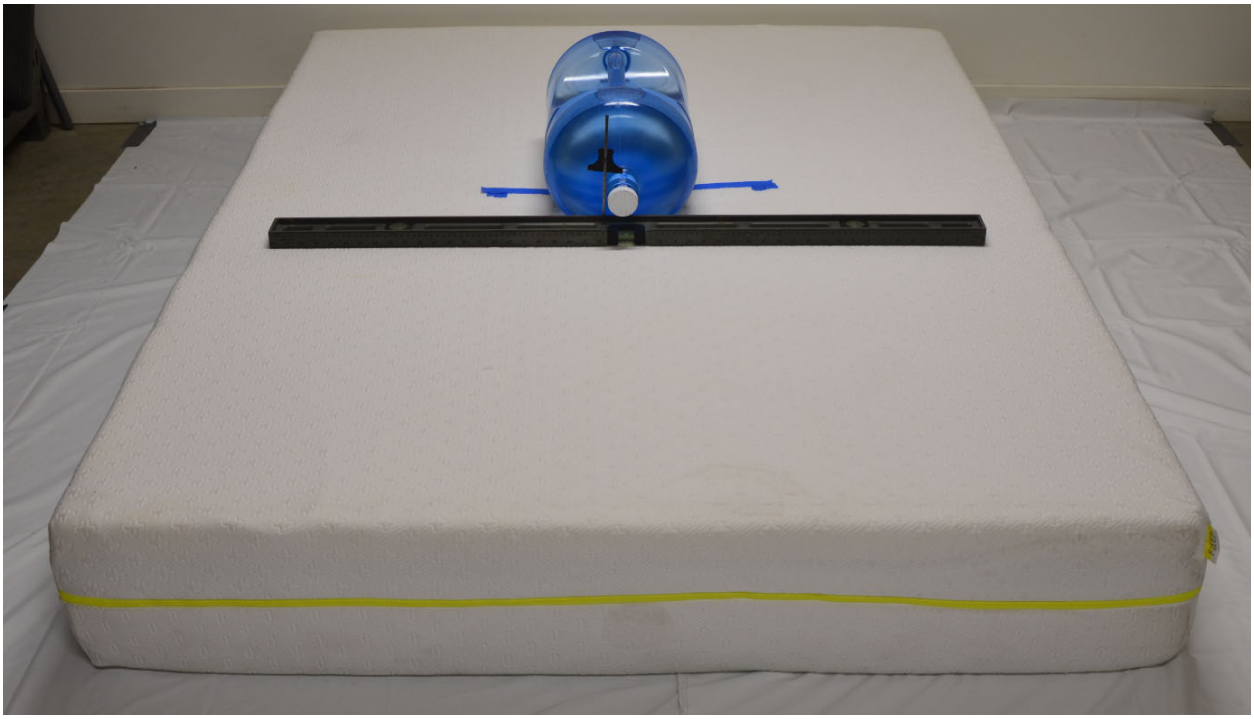


Figure 3: Typical setup for Test 1

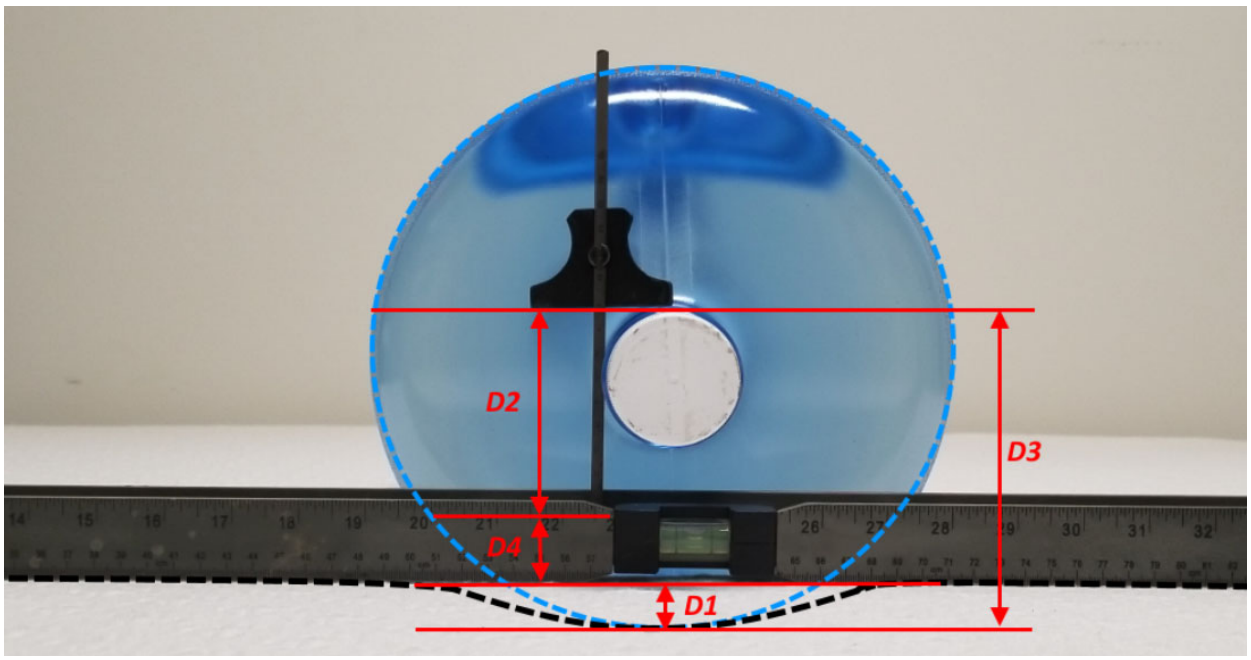


Figure 4: Deflection measurements for Test 1

Figure 4 shows the critical measurements taken for Test 1 in order to determine the vertical displacement with Reference Load 1 applied.

The vertical deflection value of interest for Test 1 is D_1 as defined below:

$$D_1 = D_3 - D_2 - D_4$$

$$D_2 = Measured \text{ (Deflection)}$$

$$D_3 = 160\ mm \text{ (Constant)}$$

$$D_4 = varies \text{ (Constant)}$$

The vertical displacement, D_1 can be found by inputting D_2 into the above expression.

TEST 2 – EDGE SUPPORTIVENESS

Overview and Objective: Apply Reference Load 1 to the edge each subject mattress and to measure the resultant vertical displacement of each to establish their respective positions on an "edge supportiveness" scale. A low relative vertical displacement shall indicate a mattress with more edge support, while a high relative vertical displacement shall indicate a mattress with less edge support.

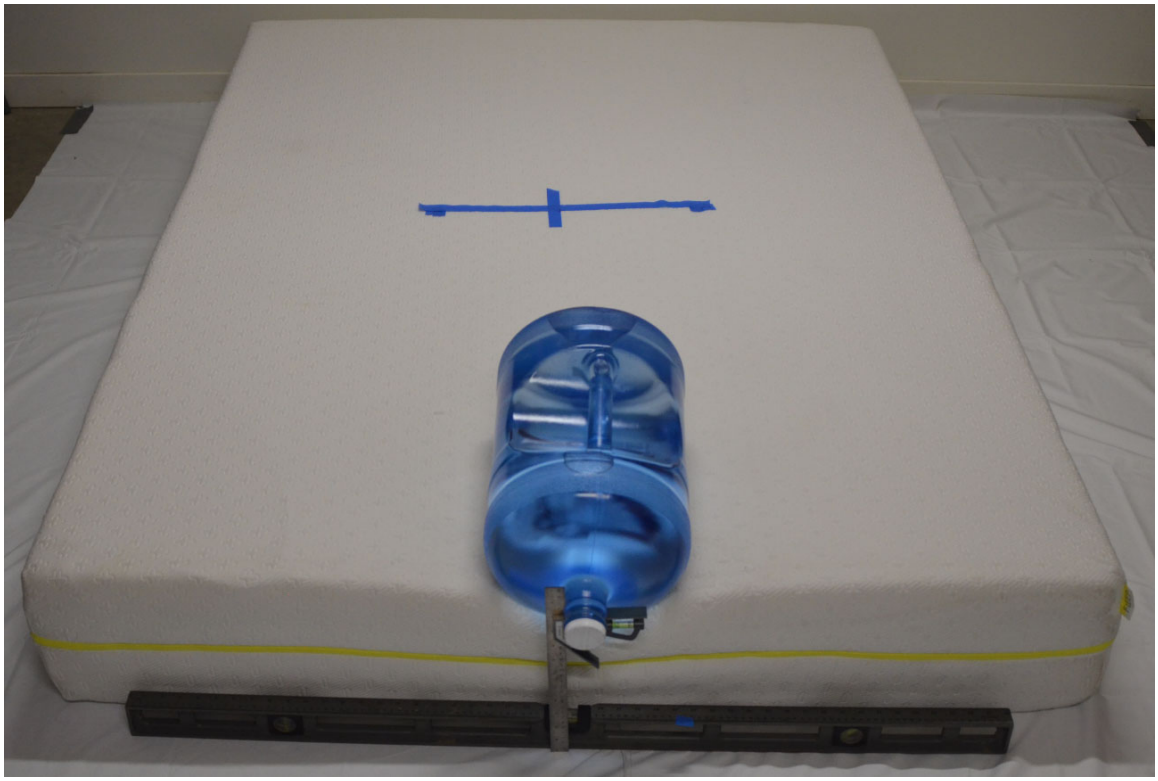


Figure 5: Typical setup for Test 2

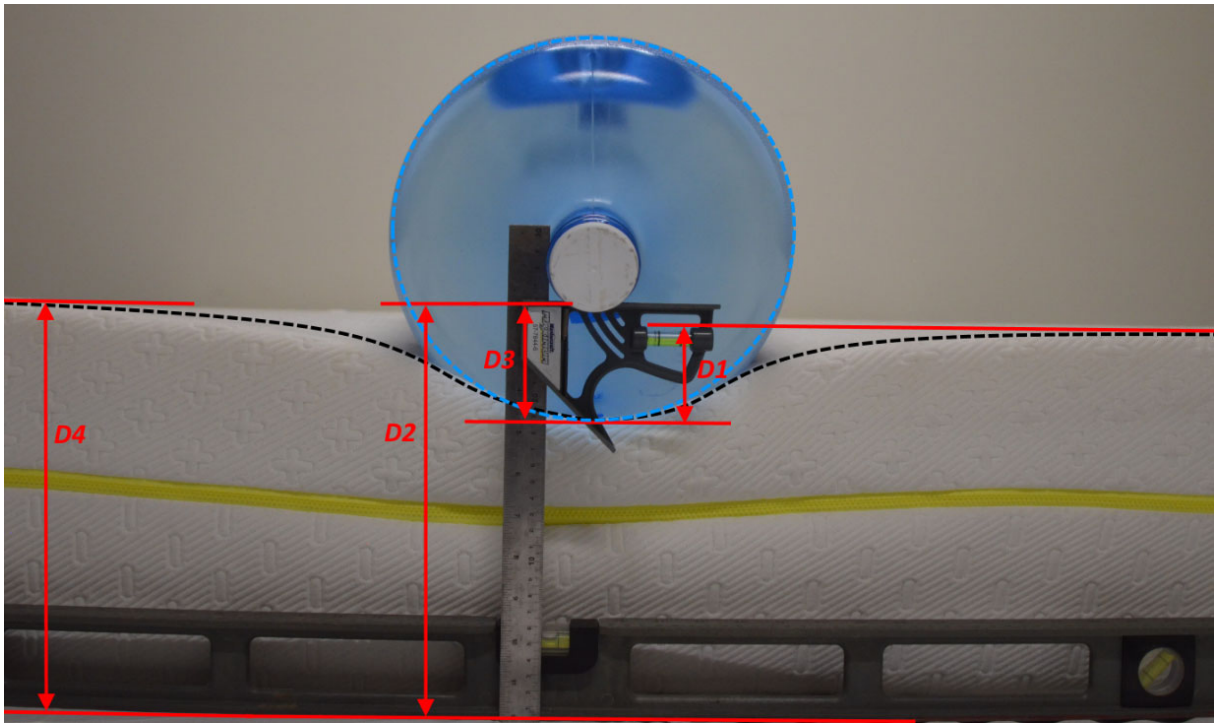


Figure 6: Deflection measurements for Test 2

The vertical deflection value of interest for Test 2 is D_1 as defined below:

$$D_1 = D_4 - (D_2 - D_3)$$

$D_2 = Measured$ (Deflection)

$D_3 = 104\ mm$ (Constant)

$D_4 = Measured$ (Mattress Height)

TEST 3 – MOTION ISOLATION

Overview and Objective: Apply a reference impulse to the top side of each subject mattress, representative of human movement on the mattress, and measure the resultant peak acceleration of a calibrated accelerometer placed on the mattress a fixed distance away from the epicenter of the impulse to establish their respective positions on a “motion isolation” scale. A high resultant peak acceleration shall indicate less motion isolation, while a low resultant peak acceleration shall indicate more motion isolation.

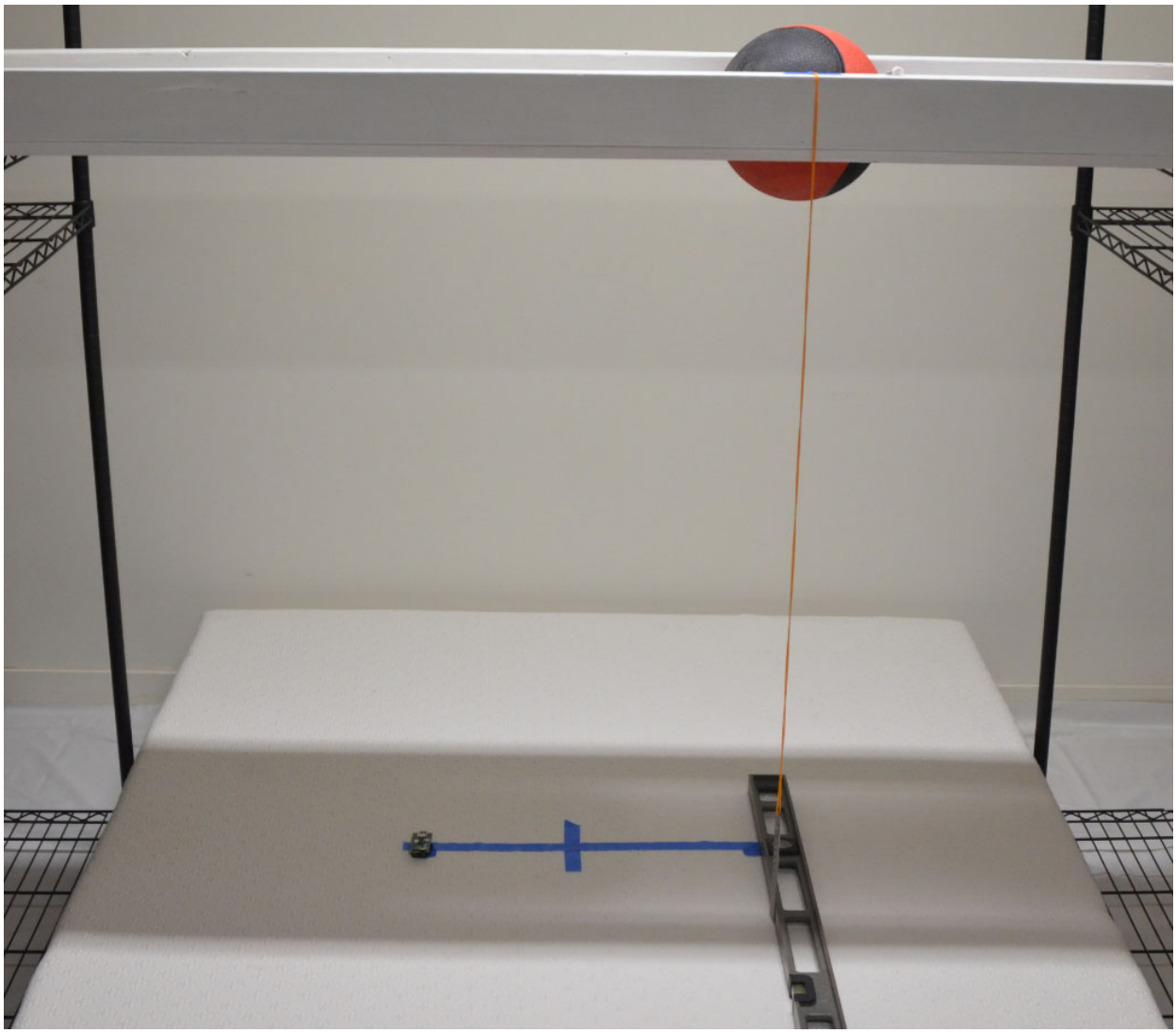


Figure 7: Typical setup for Test 3

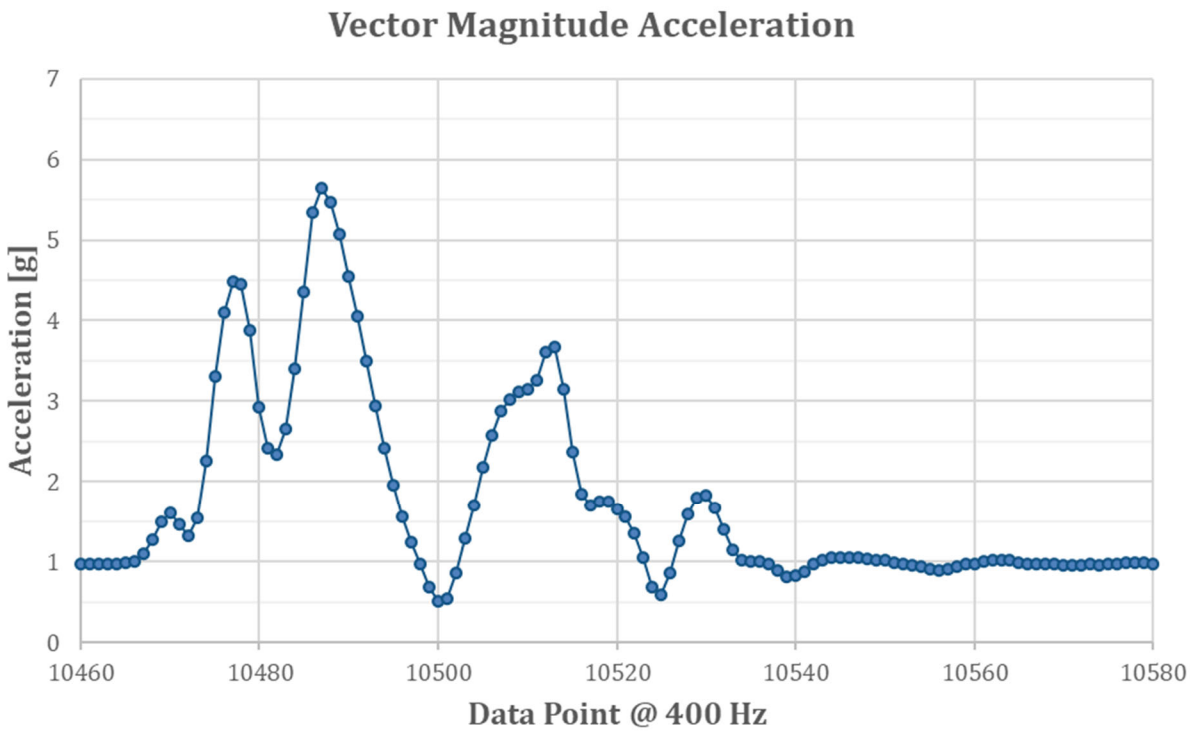


Figure 8: Example Vector Magnitude Acceleration of one ball drop

The vector magnitude of acceleration as shown above in Figure 8 is calculated using the expression shown below.

$$a = \sqrt{(x^2 + y^2 + z^2)}$$

The responsiveness of the mattress can be seen at one sleep point as a result of an impulse being applied at the second. In order to record this data, a digital accelerometer (ADXL345) was used and set to record data at 400 Hz (400 data points per second).

TEST 4 – BOUNCINESS

Overview and Objective: Drop a 10lb sphere (9” diameter) from a fixed distance on to the top side of each subject mattress and measure the resultant peak rebound height on its first bounce. A high resultant peak rebound height shall indicate more bounciness, while a low resultant peak height shall indicate less bounciness.

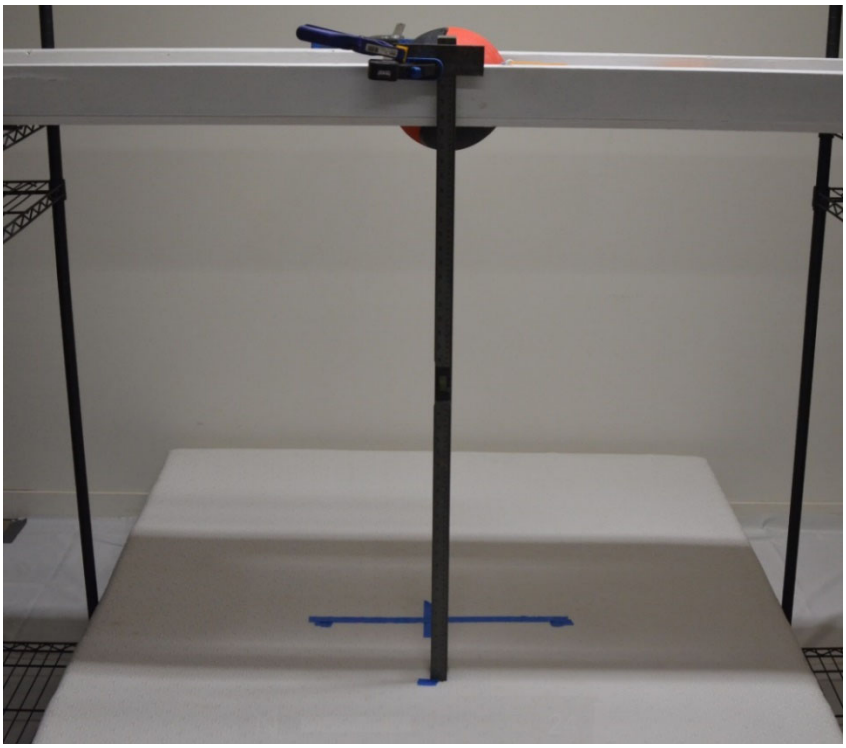


Figure 9: Typical setup for Test 4

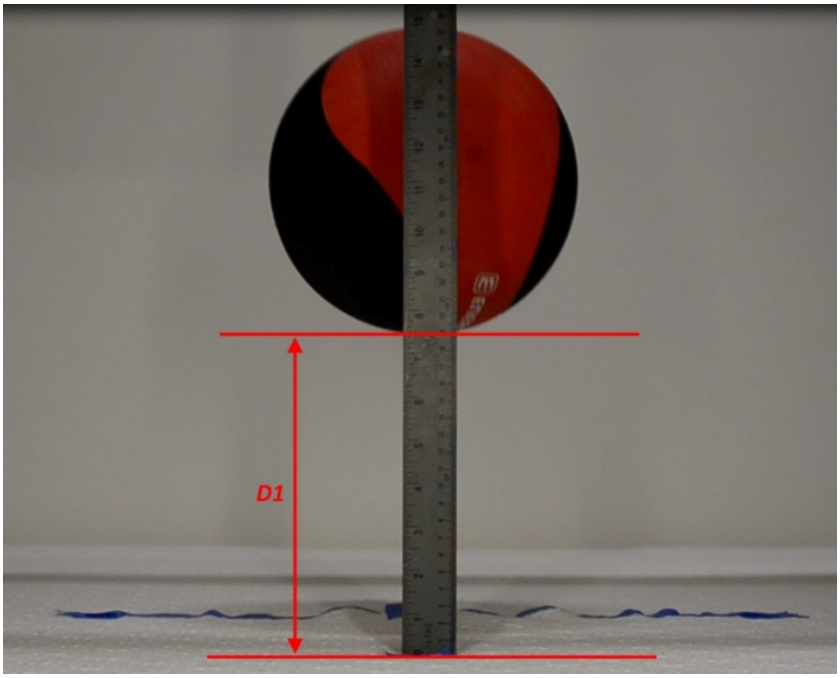


Figure 10: Rebound Measurement for Test 4

TEST 1 – RESULTS – MATTRESS FIRMNESS

Table 1: Test 1 – Mattress Firmness

	Mattress	Deflection [mm]	Deflection [in]	Measured [mm]	Out of 10
1	Amerisleep AS3	68.8	2.7	70.0	5.2
2	Apollo	76.8	3.0	70.0	4.2
3	Bear	69.8	2.7	69.0	5.1
4	Bloom Air	75.8	3.0	71.0	4.3
5	Bloom Cloud	64.3	2.5	74.5	5.8
6	Bloom Earth	76.8	3.0	70.0	4.2
7	Bloom Mist	65.8	2.6	81.0	5.6
8	Bloom River	51.8	2.0	95.0	7.4
9	Casper (V1)	71.8	2.8	67.0	4.8
10	Casper (V2)	62.8	2.5	76.0	6.0
11	Casper (V3)	78.8	3.1	68.0	3.9
12	Casper (V4)	71.8	2.8	75.0	4.8
13	Casper Element	73.8	2.9	73.0	4.6
14	Casper Essential (V1)	67.8	2.7	79.0	5.4
15	Casper Essential (V2)	65.8	2.6	81.0	5.6
16	Casper Wave	57.8	2.3	89.0	6.6
17	Cherry	53.8	2.1	93.0	7.2
18	Classic Brands (Thick)	56.8	2.2	82.0	6.8
19	Classic Brands (Thin)	46.8	1.8	92.0	8.1
20	Dormeo	76.8	3.0	70.0	4.2
21	Douglas (V1)	68.3	2.7	70.5	5.3
22	Douglas (V2)	57.8	2.3	81.0	6.6
23	Douglas Alpine	78.8	3.1	68.0	3.9
24	Emma	67.8	2.7	79.0	5.4
25	Endy (V1)	76.3	3.0	62.5	4.3
26	Endy (V2)	51.8	2.0	87.0	7.4
27	Fleep (Firm)	50.3	2.0	88.5	7.6
28	Fleep (Soft)	69.3	2.7	69.5	5.2
29	Full Moon	68.8	2.7	78.0	5.2
30	GhostBed Classic	68.8	2.7	78.0	5.2
31	GhostBed Luxe	74.8	2.9	72.0	4.5
32	Gotta Sleep (OMG)	81.8	3.2	65.0	3.6
33	Haven Rejuvenate	48.8	1.9	98.0	7.8
34	Helix	61.8	2.4	77.0	6.1
35	Helix Midnight	87.8	3.5	59.0	2.8
36	iComfort	65.8	2.6	73.0	5.6
37	IKEA Foam	58.8	2.3	88.0	6.5
38	IKEA Spring	54.8	2.2	92.0	7.0
39	Juno	65.8	2.6	81.0	5.6
40	Layla (Firm)	61.8	2.4	77.0	6.1
41	Layla (Firm) (V2)	55.8	2.2	91.0	6.9
42	Layla (Soft)	75.8	3.0	63.0	4.3
43	Layla (Soft) (V2)	79.8	3.1	67.0	3.8
44	Leesa	76.3	3.0	62.5	4.3
45	Leesa (V2)	74.8	2.9	72.0	4.5
46	Lucid	53.8	2.1	85.0	7.2
47	Lull	71.8	2.8	75.0	4.8
48	Luna	66.8	2.6	72.0	5.5
49	Mira (V1)	51.8	2.0	95.0	7.4
50	Mira (V2)	61.8	2.4	85.0	6.1
51	Nectar	76.8	3.0	70.0	4.2
52	Nectar (V2)	82.8	3.3	64.0	3.4
53	Nectar Premier	80.8	3.2	66.0	3.7
54	Nolah	78.8	3.1	68.0	3.9
55	Nora	58.8	2.3	80.0	6.5
56	Novaform	82.8	3.3	64.0	3.4
57	Novosbed Firm	59.3	2.3	79.5	6.5
58	Novosbed Firm (V2)	69.8	2.7	77.0	5.1
59	Novosbed Medium	68.3	2.7	70.5	5.3
60	Novosbed Medium (V2)	80.8	3.2	66.0	3.7
61	Novosbed Soft	79.3	3.1	59.5	3.9
62	Novosbed Soft (V2)	84.8	3.3	62.0	3.2
63	PerfectSense	61.8	2.4	85.0	6.1
64	PolySleep	65.8	2.6	73.0	5.6
65	Puffy (V1)	78.8	3.1	60.0	3.9
66	Puffy (V2)	80.8	3.2	66.0	3.7
67	Puffy Lux	72.8	2.9	74.0	4.7
68	Purple	66.8	2.6	72.0	5.5
69	Purple (V2)	77.8	3.1	69.0	4.1
70	Purple Plus	86.8	3.4	60.0	2.9
71	Recore	72.8	2.9	74.0	4.7
72	Saatva Loom & Leaf	82.8	3.3	64.0	3.4
73	Saatva Zenhaven	70.8	2.8	76.0	5.0
74	Sealy Cocoon	48.8	1.9	98.0	7.8
75	Sealy Cocoon Classic	68.8	2.7	78.0	5.2
76	Sealy Posturepedic	76.8	3.0	62.0	4.2
77	Serta Chinook	70.8	2.8	76.0	5.0
78	Silk & Snow (V1)	77.8	3.1	69.0	4.1
79	Silk & Snow (V2)	80.8	3.2	66.0	3.7
80	Simba (V1)	36.8	1.4	110.0	9.4
81	Simba (V2)	84.8	3.3	62.0	3.2
82	Spa Sensations	71.8	2.8	75.0	4.8
83	Structube	41.8	1.6	105.0	8.7
84	Tempur-Pedic	68.8	2.7	70.0	5.2
85	Tuft & Needle (V1)	66.8	2.6	72.0	5.5
86	Tuft & Needle (V2)	57.8	2.3	89.0	6.6
87	Zinus	83.8	3.3	63.0	3.3

Table 2: Test 1 – Mattress Firmness - Hybrid Mattresses

	Mattress	Deflection [mm]	Deflection [in]	Measured [mm]	Out of 10
88	Avocado Green	63.8	2.5	83.0	7.6
89	Brunswick	82.8	3.3	64.0	6.2
90	Casper Hybrid	79.8	3.1	67.0	6.4
91	Casper Nova	78.8	3.1	68.0	6.5
92	Casper Wave Hybrid	81.8	3.2	65.0	6.3
93	DreamCloud	88.8	3.5	58.0	5.7
94	Endy Hybrid	88.8	3.5	58.0	5.7
95	Hamuq	63.8	2.5	75.0	7.6
96	Haven Lux Hybrid	77.8	3.1	69.0	6.6
97	Hush	75.8	3.0	71.0	6.7
98	Kingsdown	80.8	3.2	66.0	6.3
99	Layla Hybrid (Firm)	65.8	2.6	81.0	7.5
100	Layla Hybrid (Soft)	79.8	3.1	67.0	6.4
101	Logan & Cove (Firm)	62.8	2.5	76.0	7.7
102	Logan & Cove (Medium)	81.8	3.2	65.0	6.3
103	Purple Hybrid	72.8	2.9	74.0	6.9
104	Saatva	80.8	3.2	58.0	6.3
105	Silk & Snow Hybrid (V1)	66.8	2.6	80.0	7.4
106	Silk & Snow Hybrid (V2)	76.8	3.0	70.0	6.6
107	Silk & Snow Organic	75.8	3.0	71.0	6.7
108	Simmons Beautyrest Black	75.8	3.0	63.0	6.7
109	Springwall	68.8	2.7	78.0	7.2
110	Stearns & Foster	70.8	2.8	76.0	7.1
111	WinkBed	75.8	3.0	71.0	6.7

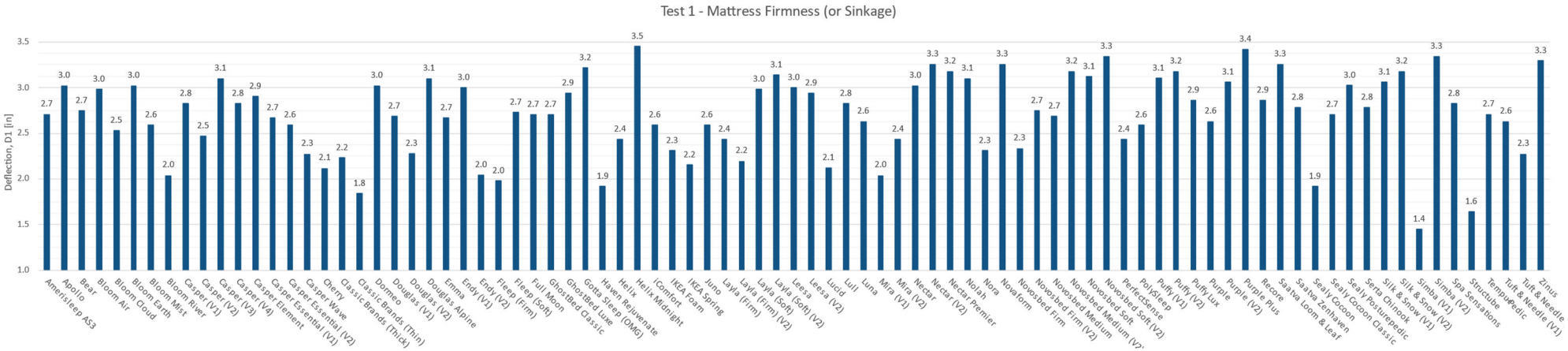


Figure 11: Test 1 – Mattress Firmness measuring how far Reference Load 1 deflects in the center of the mattress. A higher number indicates a softer mattress.

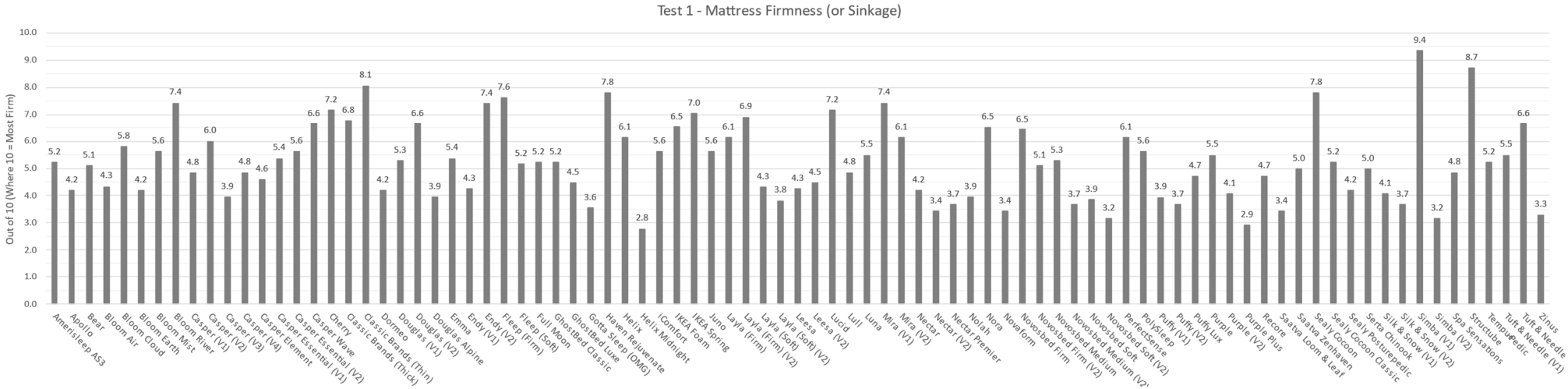


Figure 12: Test 1 – Mattress Firmness on a scale from 1 to 10 based on the given mattresses that were sampled (where 10 = most firm)

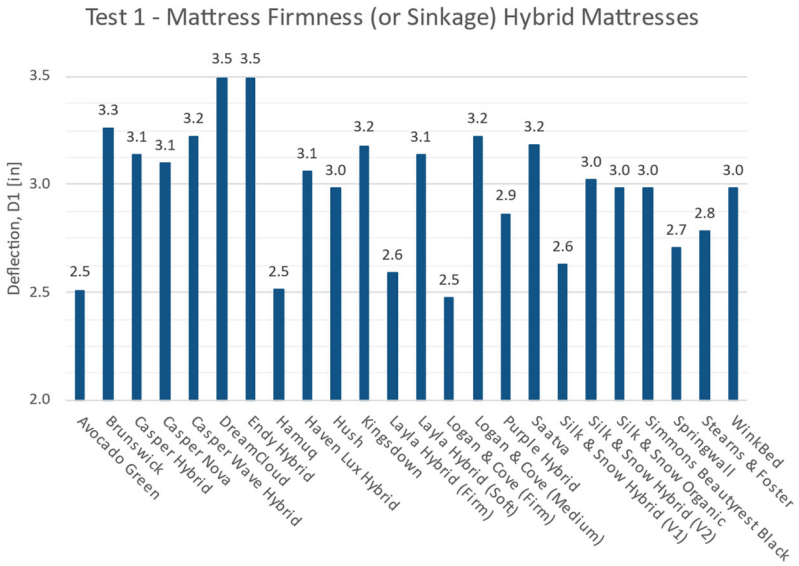


Figure 13: Test 1 – Mattress Firmness measuring how far Reference Load 1 deflects in the center of the mattress. A higher number indicates a softer mattress. Hybrid mattresses.

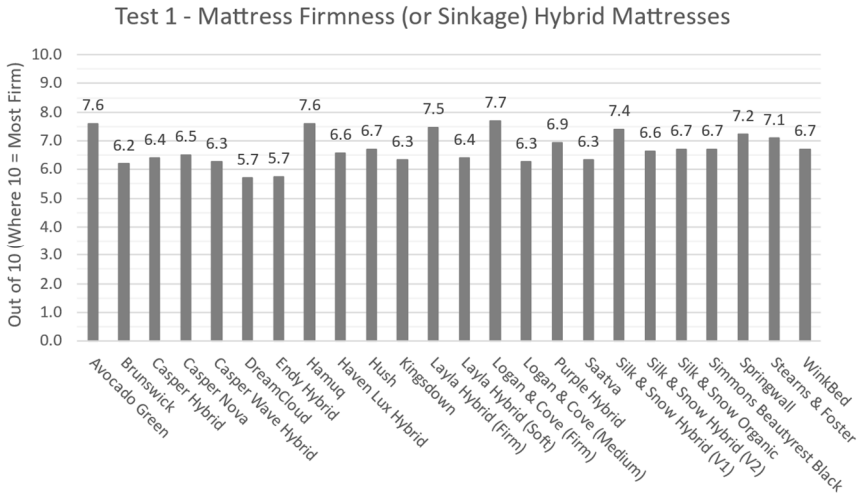


Figure 14: Test 1 – Mattress Firmness on a scale from 1 to 10 based on the given mattresses that were sampled (where 10 = most firm. Hybrid mattresses.

TEST 2 – RESULTS – EDGE SUPPORTIVENESS

Table 3: Test 2 – Edge Supportiveness

	Mattress	Mattress Height, D4 [mm]	Mattress Height, D4 [in]	Measured Depth, D2 [mm]	Measured Depth, D2 [in]	Deflection, D1 [mm]	Deflection, D1 [in]	Out of 10
1	Amerisleep AS3	288	11.3	285	11.2	107.0	4.2	4.7
2	Apollo	307	12.1	285	11.2	126.0	5.0	3.1
3	Bear	235	9.3	241	9.5	98.0	3.9	5.4
4	Bloom Air	227	8.9	254	10.0	77.0	3.0	7.1
5	Bloom Cloud	281	11.1	301	11.9	84.0	3.3	6.5
6	Bloom Earth	201	7.9	213	8.4	92.0	3.6	5.9
7	Bloom Mist	227	8.9	248	9.8	83.0	3.3	6.6
8	Bloom River	180	7.1	190	7.5	94.0	3.7	5.7
9	Casper (V1)	249	9.8	268	10.6	85.0	3.3	6.5
10	Casper (V2)	233	9.2	198	7.8	139.0	5.5	2.1
11	Casper (V3)	285	11.2	288	11.3	101.0	4.0	5.2
12	Casper (V4)	260	10.2	261	10.3	103.0	4.1	5.0
13	Casper Element	240	9.4	235	9.3	109.0	4.3	4.5
14	Casper Essential (V1)	214	8.4	210	8.3	108.0	4.3	4.6
15	Casper Essential (V2)	271	10.7	279	11.0	96.0	3.8	5.6
16	Casper Wave	270	10.6	281	11.1	93.0	3.7	5.8
17	Cherry	156	6.1	161	6.3	99.0	3.9	5.3
18	Classic Brands (Thick)	204	8.0	239	9.4	69.0	2.7	7.8
19	Classic Brands (Thin)	154	6.1	194	7.6	64.0	2.5	8.2
20	Dormeo	304	12.0	314	12.4	94.0	3.7	5.7
21	Douglas (V1)	258	10.2	276	10.9	86.0	3.4	6.4
22	Douglas (V2)	253	10.0	283	11.1	74.0	2.9	7.3
23	Douglas Alpine	290	11.4	267	10.5	127.0	5.0	3.1
24	Emma	305	12.0	294	11.6	115.0	4.5	4.0
25	Endy (V1)	261	10.3	250	9.8	115.0	4.5	4.0
26	Endy (V2)	247	9.7	235	9.3	116.0	4.6	3.9
27	Fleep (Firm)	249	9.8	259	10.2	94.0	3.7	5.7
28	Fleep (Soft)	249	9.8	243	9.6	110.0	4.3	4.4
29	Full Moon	208	8.2	210	8.3	102.0	4.0	5.1
30	GhostBed Classic	266	10.5	285	11.2	85.0	3.3	6.5
31	GhostBed Luxe	310	12.2	286	11.3	128.0	5.0	3.0
32	Gotta Sleep (OMG)	251	9.9	246	9.7	109.0	4.3	4.5
33	Haven Rejuvenate	255	10.0	281	11.1	78.0	3.1	7.0
34	Helix	252	9.9	222	8.7	134.0	5.3	2.5
35	Helix Midnight	300	11.8	296	11.7	108.0	4.3	4.6
36	iComfort	302	11.9	324	12.8	82.0	3.2	6.7
37	IKEA Foam	178	7.0	195	7.7	87.0	3.4	6.3
38	IKEA Spring	237	9.3	259	10.2	82.0	3.2	6.7
39	Juno	196	7.7	185	7.3	115.0	4.5	4.0
40	Layla (Firm)	270	10.6	271	10.7	103.0	4.1	5.0
41	Layla (Firm) (V2)	280	11.0	268	10.6	116.0	4.6	3.9
42	Layla (Soft)	270	10.6	225	8.9	149.0	5.9	1.3
43	Layla (Soft) (V2)	280	11.0	247	9.7	137.0	5.4	2.2
44	Leesa	250	9.8	273	10.7	81.0	3.2	6.8
45	Leesa (V2)	270	10.6	243	9.6	131.0	5.2	2.7
46	Lucid	254	10.0	292	11.5	66.0	2.6	8.0
47	Lull	250	9.8	257	10.1	97.0	3.8	5.5
48	Luna	256	10.1	275	10.8	85.0	3.3	6.5
49	Mira (V1)	200	7.9	218	8.6	86.0	3.4	6.4
50	Mira (V2)	245	9.6	288	11.3	61.0	2.4	8.4
51	Nectar	267	10.5	270	10.6	101.0	4.0	5.2
52	Nectar (V2)	290	11.4	253	10.0	141.0	5.6	1.9
53	Nectar Premier	330	13.0	279	11.0	155.0	6.1	0.8
54	Nolah	260	10.2	237	9.3	127.0	5.0	3.1
55	Nora	289	11.4	272	10.7	121.0	4.8	3.5
56	Novaform	340	13.4	312	12.3	132.0	5.2	2.7
57	Novosbed Firm	293	11.5	316	12.4	81.0	3.2	6.8
58	Novosbed Firm (V2)	279	11.0	290	11.4	93.0	3.7	5.8
59	Novosbed Medium	307	12.1	311	12.2	100.0	3.9	5.2
60	Novosbed Medium (V2)	272	10.7	258	10.2	118.0	4.6	3.8
61	Novosbed Soft	286	11.3	276	10.9	114.0	4.5	4.1
62	Novosbed Soft (V2)	265	10.4	262	10.3	107.0	4.2	4.7
63	PerfectSense	255	10.0	265	10.4	94.0	3.7	5.7
64	PolySleep	248	9.8	297	11.7	55.0	2.2	8.9
65	Puffy (V1)	246	9.7	248	9.8	102.0	4.0	5.1
66	Puffy (V2)	257	10.1	230	9.1	131.0	5.2	2.7
67	Puffy Lux	304	12.0	297	11.7	111.0	4.4	4.4
68	Purple	242	9.5	236	9.3	110.0	4.3	4.4
69	Purple (V2)	240	9.4	234	9.2	110.0	4.3	4.4
70	Purple Plus	300	11.8	268	10.6	136.0	5.4	2.3
71	Recore	285	11.2	309	12.2	80.0	3.1	6.9
72	Saatva Loom & Leaf	300	11.8	294	11.6	110.0	4.3	4.4
73	Saatva Zenhaven	280	11.0	278	10.9	106.0	4.2	4.8
74	Sealy Cocoon	222	8.7	271	10.7	55.0	2.2	8.9
75	Sealy Cocoon Classic	260	10.2	265	10.4	99.0	3.9	5.3
76	Sealy Posturepedic	325	12.8	312	12.3	117.0	4.6	3.9
77	Serta Chinook	230	9.1	233	9.2	101.0	4.0	5.2
78	Silk & Snow (V1)	265	10.4	268	10.6	101.0	4.0	5.2
79	Silk & Snow (V2)	250	9.8	253	10.0	101.0	4.0	5.2
80	Simba (V1)	263	10.4	301	11.9	66.0	2.6	8.0
81	Simba (V2)	304	12.0	282	11.1	126.0	5.0	3.1
82	Spa Sensations	224	8.8	216	8.5	112.0	4.4	4.3
83	Structube	275	10.8	316	12.4	63.0	2.5	8.2
84	Tempur-Pedic	286	11.3	246	9.7	144.0	5.7	1.7
85	Tuft & Needle (V1)	251	9.9	270	10.6	85.0	3.3	6.5
86	Tuft & Needle (V2)	245	9.6	269	10.6	80.0	3.1	6.9
87	Zinus	290	11.4	295	11.6	99.0	3.9	5.3

Table 4: Test 2 – Edge Supportiveness - Hybrid Mattresses

		Mattress Height, D4		Measured Depth, D2		Deflection, D1 [in]		
	Mattress	[mm]	[in]	[mm]	[in]	[mm]	[in]	Out of 10
88	Avocado Green	279	11.0	309	12.2	74.0	2.9	7.3
89	Brunswick	298	11.7	309	12.2	93.0	3.7	5.8
90	Casper Hybrid	260	10.2	236	9.3	128.0	5.0	3.0
91	Casper Nova	300	11.8	281	11.1	123.0	4.8	3.4
92	Casper Wave Hybrid	300	11.8	275	10.8	129.0	5.1	2.9
93	DreamCloud	340	13.4	350	13.8	94.0	3.7	5.7
94	Endy Hybrid	308	12.1	315	12.4	97.0	3.8	5.5
95	Hamuq	300	11.8	328	12.9	76.0	3.0	7.2
96	Haven Lux Hybrid	359	14.1	338	13.3	125.0	4.9	3.2
97	Hush	327	12.9	310	12.2	121.0	4.8	3.5
98	Kingsdown	369	14.5	355	14.0	118.0	4.6	3.8
99	Layla Hybrid (Firm)	330	13.0	326	12.8	108.0	4.3	4.6
100	Layla Hybrid (Soft)	330	13.0	286	11.3	148.0	5.8	1.4
101	Logan & Cove (Firm)	352	13.9	390	15.4	66.0	2.6	8.0
102	Logan & Cove (Medium)	350	13.8	343	13.5	111.0	4.4	4.4
103	Purple Hybrid	279	11.0	305	12.0	78.0	3.1	7.0
104	Saatva	400	15.7	384	15.1	120.0	4.7	3.6
105	Silk & Snow Hybrid (V1)	284	11.2	285	11.2	103.0	4.1	5.0
106	Silk & Snow Hybrid (V2)	295	11.6	325	12.8	74.0	2.9	7.3
107	Silk & Snow Organic	300	11.8	329	13.0	75.0	3.0	7.3
108	Simmons Beautyrest Black	355	14.0	349	13.7	110.0	4.3	4.4
109	Springwall	232	9.1	288	11.3	48.0	1.9	9.5
110	Stearns & Foster	342	13.5	355	14.0	91.0	3.6	6.0
111	WinkBed	330	13.0	356	14.0	78.0	3.1	7.0

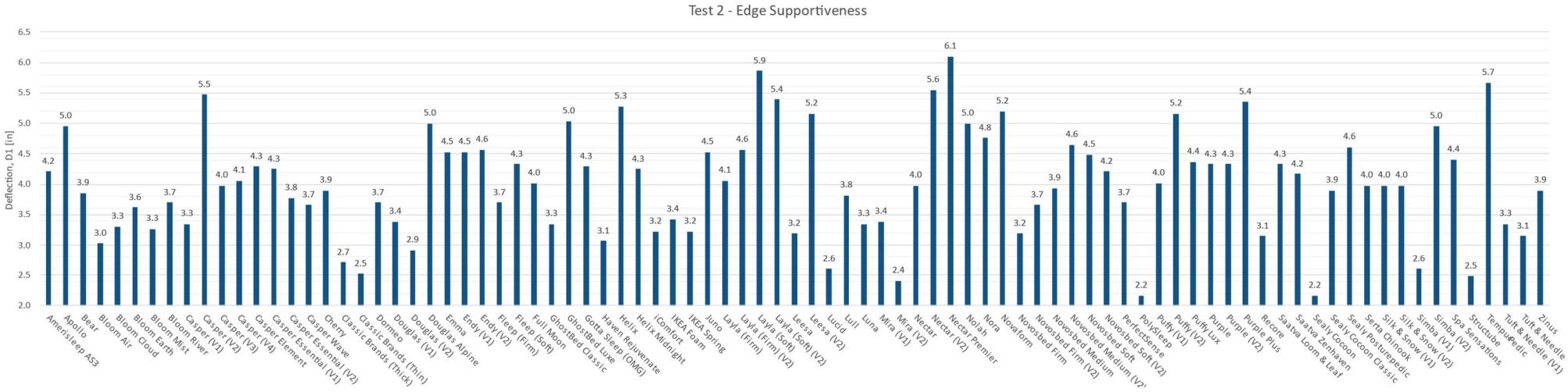


Figure 15: Test 2 – Mattress Firmness measuring how far Reference Load 1 deflects on the edge of the mattress. A higher number indicates a softer mattress.

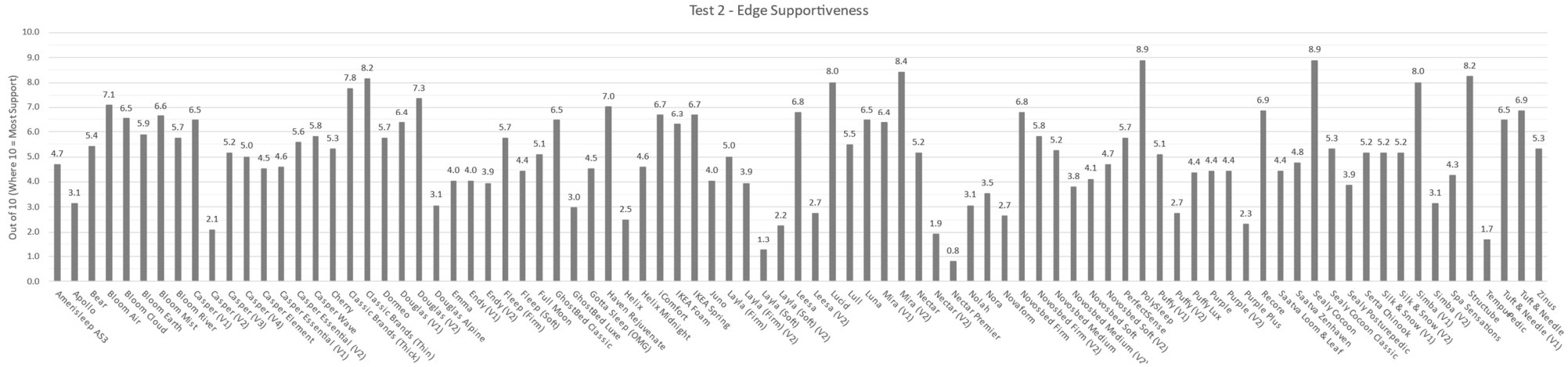


Figure 16: Test 2 – Mattress Firmness on a scale from 1 to 10 based on the given mattresses that were sampled (where 10 = most firm)

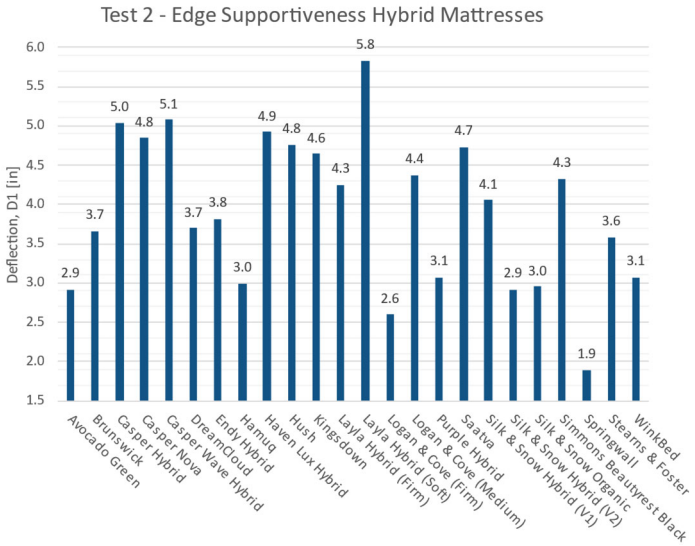


Figure 17: Test 2 – Mattress Firmness measuring how far Reference Load 1 deflects on the edge of the mattress. A higher number indicates a softer mattress. Hybrid mattresses.

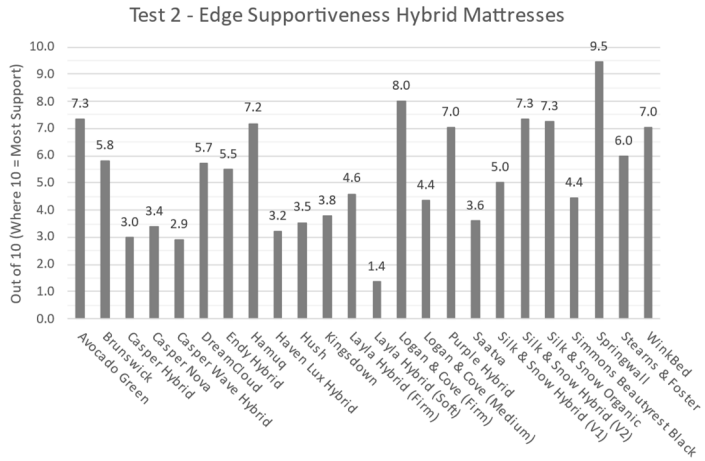


Figure 18: Test 2 – Mattress Firmness on a scale from 1 to 10 based on the given mattresses that were sampled (where 10 = most firm). Hybrid mattresses.

TEST 3 – RESULTS – MOTION ISOLATION

Table 5: Test 3 – Motion Isolation

	Mattress	Average Peak Acceleration [g]	Out of 10
1	Amerisleep AS3	6.8	5.9
2	Apollo	2.3	8.6
3	Bear	5.1	6.9
4	Bloom Air	5.9	6.5
5	Bloom Cloud	5.1	6.9
6	Bloom Earth	4.5	7.3
7	Bloom Mist	5.9	6.5
8	Bloom River	5.3	6.8
9	Casper (V1)	8.7	4.8
10	Casper (V2)	6.1	6.4
11	Casper (V3)	4.8	7.1
12	Casper (V4)	4.8	7.1
13	Casper Element	6.9	5.9
14	Casper Essential (V1)	5.8	6.5
15	Casper Essential (V2)	5.3	6.8
16	Casper Wave	4.9	7.1
17	Cherry	6.1	6.4
18	Classic Brands (Thick)	7.0	5.8
19	Classic Brands (Thin)	6.4	6.2
20	Dormeo	6.7	6.0
21	Douglas (V1)	3.3	8.0
22	Douglas (V2)	2.8	8.3
23	Douglas Alpine	2.0	8.8
24	Emma	4.9	7.0
25	Endy (V1)	5.1	6.9
26	Endy (V2)	5.7	6.6
27	Fleep (Firm)	5.2	6.9
28	Fleep (Soft)	5.2	6.9
29	Full Moon	4.2	7.5
30	GhostBed Classic	4.7	7.2
31	GhostBed Luxe	4.4	7.4
32	Gotta Sleep (OMG)	5.9	6.4
33	Haven Rejuvenate	6.2	6.3
34	Helix	5.4	6.7
35	Helix Midnight	5.9	6.5
36	iComfort	4.4	7.4
37	IKEA Foam	8.6	4.8
38	IKEA Spring	4.8	7.1
39	Juno	6.3	6.2
40	Layla (Firm)	5.8	6.5
41	Layla (Firm) (V2)	5.8	6.5
42	Layla (Soft)	5.9	6.4
43	Layla (Soft) (V2)	9.0	4.6
44	Leesa	6.4	6.1
45	Leesa (V2)	8.0	5.2
46	Lucid	5.4	6.8
47	Lull	4.3	7.4
48	Luna	6.6	6.1
49	Mira (V1)	5.3	6.8
50	Mira (V2)	3.4	7.9
51	Nectar	4.5	7.3
52	Nectar (V2)	8.3	5.0
53	Nectar Premier	6.7	6.0
54	Nolah	5.2	6.9
55	Nora	3.1	8.1
56	Novaform	3.0	8.2
57	Novosbed Firm	5.4	6.8
58	Novosbed Firm (V2)	5.4	6.8
59	Novosbed Medium	5.0	7.0
60	Novosbed Medium (V2)	5.3	6.8
61	Novosbed Soft	6.7	6.0
62	Novosbed Soft (V2)	4.5	7.3
63	PerfectSense	9.8	4.1
64	PolySleep	3.3	8.0
65	Puffy (V1)	5.0	7.0
66	Puffy (V2)	6.1	6.3
67	Puffy Lux	4.6	7.3
68	Purple	9.9	4.0
69	Purple (V2)	10.8	3.5
70	Purple Plus	5.5	6.7
71	Recore	4.8	7.1
72	Saatva Loom & Leaf	6.1	6.4
73	Saatva Zenhaven	6.5	6.1
74	Sealy Cocoon	6.7	6.0
75	Sealy Cocoon Classic	3.7	7.8
76	Sealy Posturepedic	6.5	6.1
77	Serta Chinook	4.4	7.4
78	Silk & Snow (V1)	3.9	7.6
79	Silk & Snow (V2)	4.0	7.6
80	Simba (V1)	6.2	6.3
81	Simba (V2)	5.7	6.6
82	Spa Sensations	7.1	5.7
83	Structube	5.9	6.5
84	Tempur-Pedic	4.3	7.4
85	Tuft & Needle (V1)	4.7	7.2
86	Tuft & Needle (V2)	5.9	6.5
87	Zinus	4.3	7.4

Table 6: Test 3 – Motion Isolation - Hybrid Mattresses

	Mattress	Average Peak Acceleration [g]	Out of 10
88	Avocado Green	6.8	5.9
89	Brunswick	5.5	6.7
90	Casper Hybrid	9.5	4.3
91	Casper Nova	4.8	7.1
92	Casper Wave Hybrid	5.2	6.9
93	DreamCloud	6.8	5.9
94	Endy Hybrid	4.8	7.2
95	Hamuq	6.0	6.4
96	Haven Lux Hybrid	4.6	7.3
97	Hush	4.6	7.2
98	Kingsdown	4.9	7.1
99	Layla Hybrid (Firm)	7.0	5.8
100	Layla Hybrid (Soft)	4.6	7.2
101	Logan & Cove (Firm)	5.2	6.9
102	Logan & Cove (Medium)	5.1	7.0
103	Purple Hybrid	5.8	6.5
104	Saatva	5.2	6.9
105	Silk & Snow Hybrid (V1)	4.9	7.0
106	Silk & Snow Hybrid (V2)	3.3	8.0
107	Silk & Snow Organic	5.1	7.0
108	Simmons Beautyrest Black	3.6	7.8
109	Springwall	6.5	6.1
110	Stearns & Foster	4.1	7.6
111	WinkBed	5.6	6.7

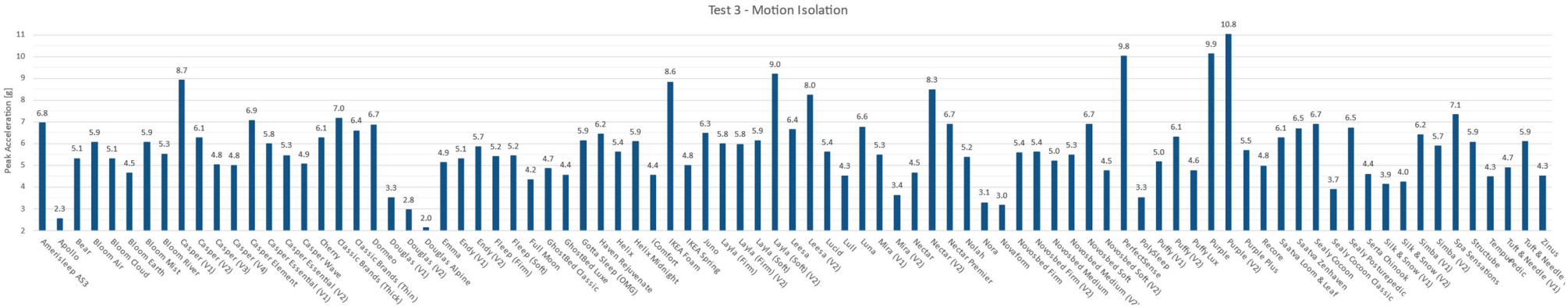


Figure 19: Test 3 - Peak Acceleration at one sleep point when Reference Load 2 is dropped on the other sleep point. Values shown are an average of 20 runs per mattress.

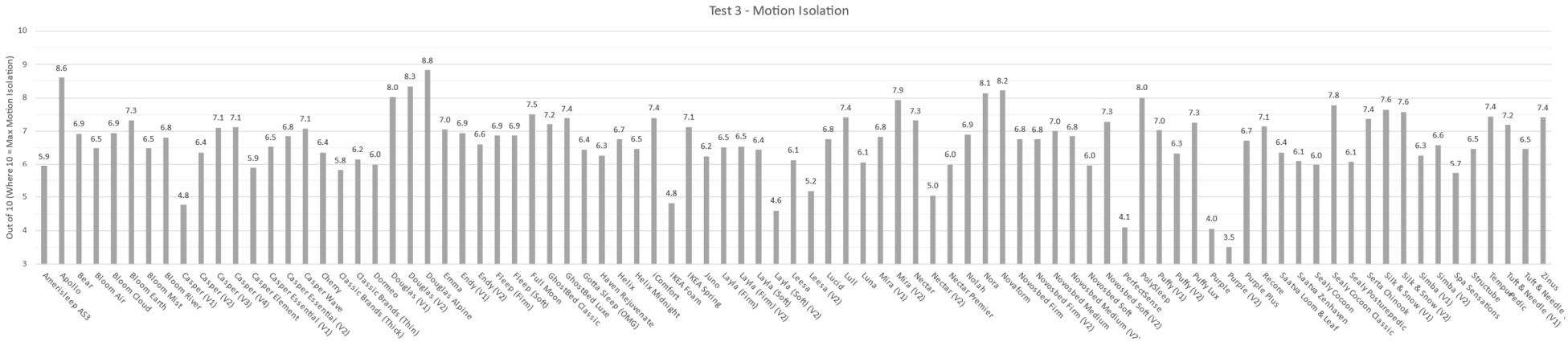


Figure 20: Test 3 – Motion Isolation on a scale from 1 to 10 based on the given mattresses that were sampled (where 10 = max motion isolation)

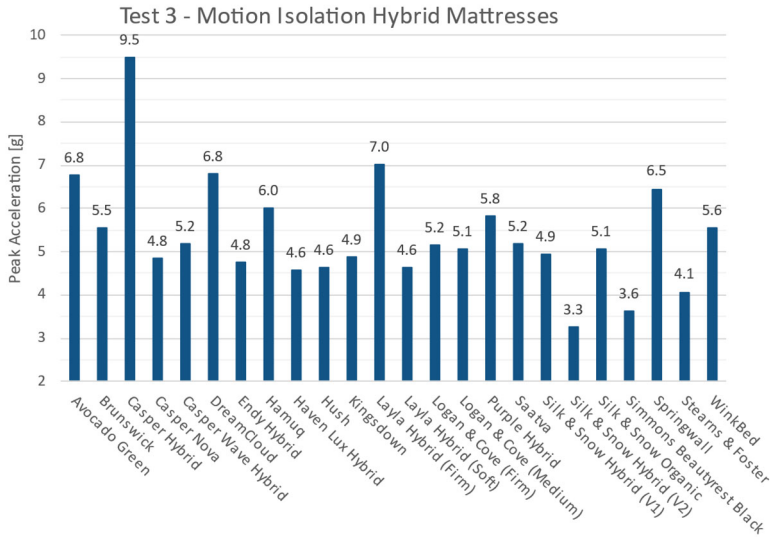


Figure 21: Test 3 - Peak Acceleration at one sleep point when Reference Load 2 is dropped on the other sleep point. Values shown are an average of 20 runs per mattress. Hybrid mattresses.

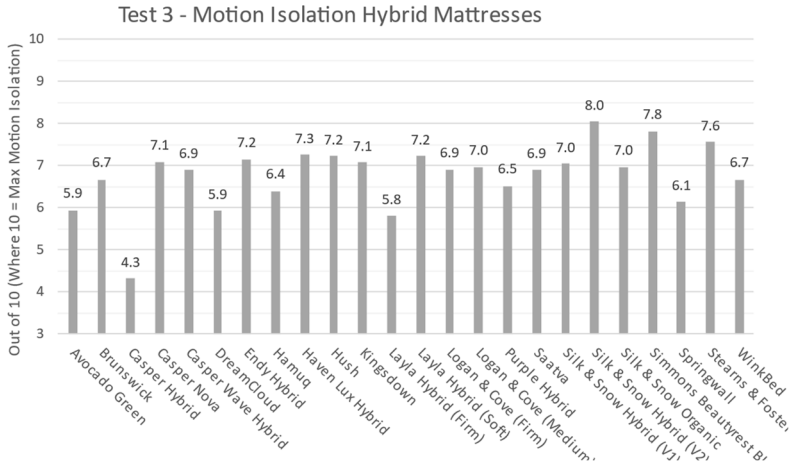


Figure 22: Test 3 – Motion Isolation on a scale from 1 to 10 based on the given mattresses that were sampled (where 10 = max motion isolation. Hybrid mattresses.

TEST 4 – RESULTS - BOUNCINESS

Table 7: Test 4 – Bounciness

	Mattress	Rebound Height Run 1,	Rebound Height Run 2,	Rebound Height Run 3,	Rebound Height Average, [in]	Out of 10
1	Amerisleep AS3	3.1	3.0	3.3	3.1	2.9
2	Apollo	1.8	1.8	1.5	1.7	2.0
3	Bear	3.8	3.8	3.9	3.8	3.3
4	Bloom Air	3.4	3.3	3.4	3.3	3.0
5	Bloom Cloud	3.5	3.7	4.0	3.7	3.2
6	Bloom Earth	5.3	5.1	5.1	5.2	4.1
7	Bloom Mist	3.6	3.5	3.5	3.5	3.1
8	Bloom River	3.8	4.0	3.8	3.8	3.3
9	Casper (V1)	4.9	5.0	5.1	5.0	4.0
10	Casper (V2)	5.0	4.9	5.0	5.0	4.0
11	Casper (V3)	3.5	3.5	3.5	3.5	3.1
12	Casper (V4)	6.3	6.3	6.3	6.3	4.8
13	Casper Element	8.8	8.6	8.8	8.7	6.2
14	Casper Essential (V1)	3.3	3.3	3.4	3.3	3.0
15	Casper Essential (V2)	4.3	4.1	4.3	4.2	3.5
16	Casper Wave	6.0	6.0	6.0	6.0	4.6
17	Cherry	3.5	3.8	3.4	3.5	3.1
18	Classic Brands (Thick)	3.4	3.6	3.5	3.5	3.1
19	Classic Brands (Thin)	7.1	7.1	7.2	7.1	5.3
20	Dormeo	8.8	8.8	8.6	8.7	6.2
21	Douglas (V1)	5.5	5.7	5.5	5.6	4.3
22	Douglas (V2)	3.8	3.8	3.5	3.7	3.2
23	Douglas Alpine	3.2	3.4	3.0	3.2	2.9
24	Emma	3.3	3.3	3.3	3.3	3.0
25	Endy (V1)	2.5	2.6	2.6	2.6	2.5
26	Endy (V2)	6.3	6.0	6.3	6.2	4.7
27	Fleep (Firm)	7.5	7.6	7.5	7.5	5.5
28	Fleep (Soft)	3.6	3.7	3.5	3.6	3.2
29	Full Moon	4.0	3.8	4.2	4.0	3.4
30	GhostBed Classic	3.5	3.4	3.5	3.5	3.1
31	GhostBed Luxe	3.2	3.5	2.9	3.2	2.9
32	Gotta Sleep (OMG)	3.0	3.0	3.0	3.0	2.8
33	Haven Rejuvinate	6.6	6.6	6.5	6.6	5.0
34	Helix	9.3	9.3	9.3	9.3	6.6
35	Helix Midnight	8.0	8.2	7.8	8.0	5.8
36	iComfort	1.8	2.0	1.8	1.8	2.1
37	IKEA Foam	9.6	9.5	9.8	9.6	6.8
38	IKEA Spring	12.3	12.1	12.3	12.2	8.3
39	Juno	2.6	2.6	2.6	2.6	2.6
40	Layla (Firm)	4.5	4.4	4.5	4.5	3.7
41	Layla (Firm) (V2)	6.6	6.7	6.5	6.6	4.8
42	Layla (Soft)	1.8	1.8	1.5	1.7	2.0
43	Layla (Soft) (V2)	2.3	2.1	2.5	2.3	2.3
44	Leesa	4.4	4.4	4.3	4.4	3.6
45	Leesa (V2)	3.3	3.4	3.2	3.3	2.9
46	Lucid	3.4	3.5	3.4	3.4	3.1
47	Lull	4.9	5.1	4.7	4.9	3.9
48	Luna	3.3	3.4	3.4	3.4	3.0
49	Mira (V1)	5.4	5.4	5.5	5.4	4.3
50	Mira (V2)	4.8	4.5	4.8	4.7	3.8
51	Nectar	1.3	1.3	1.1	1.2	1.7
52	Nectar (V2)	4.4	4.6	4.2	4.4	3.6
53	Nectar Premier	2.0	2.3	1.7	2.0	2.2
54	Nolah	3.1	2.9	3.3	3.1	2.8
55	Nora	3.4	3.5	3.5	3.5	3.1
56	Novaform	0.6	0.8	0.6	0.7	1.4
57	Novosbed Firm	1.2	1.3	1.3	1.3	1.8
58	Novosbed Firm (V2)	3.3	3.1	3.3	3.2	2.9
59	Novosbed Medium	1.7	1.7	1.6	1.7	2.0
60	Novosbed Medium (V2)	2.1	2.1	2.1	2.1	2.3
61	Novosbed Soft	3.4	3.5	3.6	3.5	3.1
62	Novosbed Soft (V2)	1.6	1.6	1.8	1.7	2.0
63	PerfectSense	4.3	4.4	4.3	4.3	3.6
64	PolySleep	3.5	3.8	3.6	3.6	3.2
65	Puffy (V1)	0.5	0.4	0.5	0.5	1.3
66	Puffy (V2)	4.1	4.1	4.3	4.2	3.5
67	Puffy Lux	2.8	2.9	2.8	2.8	2.7
68	Purple	8.6	8.5	8.6	8.6	6.1
69	Purple (V2)	8.5	8.1	8.9	8.5	5.9
70	Purple Plus	5.4	5.1	5.7	5.4	4.2
71	Recore	4.3	4.4	4.4	4.3	3.6
72	Saatva Loom & Leaf	3.2	3.5	2.9	3.2	2.9
73	Saatva Zenhaven	6.1	6.3	5.9	6.1	4.5
74	Sealy Cocoon	8.0	8.0	8.0	8.0	5.8
75	Sealy Cocoon Classic	4.1	4.4	3.8	4.1	3.4
76	Sealy Posturepedic	5.4	5.4	5.4	5.4	4.2
77	Serta Chinook	4.4	4.3	4.3	4.3	3.6
78	Silk & Snow (V1)	2.5	2.5	2.5	2.5	2.5
79	Silk & Snow (V2)	3.1	3.3	2.9	3.1	2.9
80	Simba (V1)	5.5	5.5	5.6	5.5	4.3
81	Simba (V2)	5.8	5.5	5.8	5.7	4.4
82	Spa Sensations	12.5	12.6	12.5	12.5	8.5
83	Structube	9.0	9.0	9.0	9.0	6.4
84	Tempur-Pedic	1.1	1.1	1.0	1.1	1.7
85	Tuft & Needle (V1)	6.3	6.5	6.4	6.4	4.8
86	Tuft & Needle (V2)	5.0	5.3	5.0	5.1	4.1
87	Zinus	1.5	1.5	1.4	1.5	1.9

Table 8: Test 4 – Bounciness - Hybrid Mattresses

	Mattress	Rebound Height Run	Rebound Height Run	Rebound Height Run	Rebound Height	Out of 10
88	Avocado Green	9.1	8.8	9.4	9.1	6.3
89	Brunswick	7.8	7.6	7.8	7.7	5.5
90	Casper Hybrid	7.3	7.6	7.0	7.3	5.2
91	Casper Nova	6.2	6.0	6.4	6.2	4.6
92	Casper Wave Hybrid	7.5	7.6	7.4	7.5	5.4
93	DreamCloud	5.0	5.2	4.8	5.0	3.9
94	Endy Hybrid	7.5	7.3	7.7	7.5	5.4
95	Hamuq	6.8	6.5	6.8	6.7	4.9
96	Haven Lux Hybrid	9.5	9.3	9.4	9.4	6.4
97	Hush	7.8	7.5	8.1	7.8	5.5
98	Kingsdown	5.4	5.3	5.3	5.3	4.1
99	Layla Hybrid (Firm)	6.3	6.0	6.6	6.3	4.7
100	Layla Hybrid (Soft)	3.7	3.5	3.3	3.5	3.0
101	Logan & Cove (Firm)	7.5	7.8	7.6	7.6	5.4
102	Logan & Cove (Medium)	3.8	3.8	3.6	3.7	3.2
103	Purple Hybrid	15.5	15.4	15.6	15.5	10.0
104	Saatva	12.2	12.5	12.3	12.3	8.2
105	Silk & Snow Hybrid (V1)	7.5	7.5	7.5	7.5	5.4
106	Silk & Snow Hybrid (V2)	6.4	6.1	6.7	6.4	4.7
107	Silk & Snow Organic	9.9	10.2	9.7	9.9	6.8
108	Simmons Beautyrest Black	6.0	5.9	6.0	6.0	4.5
109	Springwall	13.6	13.8	13.6	13.7	8.9
110	Stearns & Foster	3.3	3.3	3.1	3.2	2.9
111	WinkBed	4.9	5.2	4.6	4.9	3.8

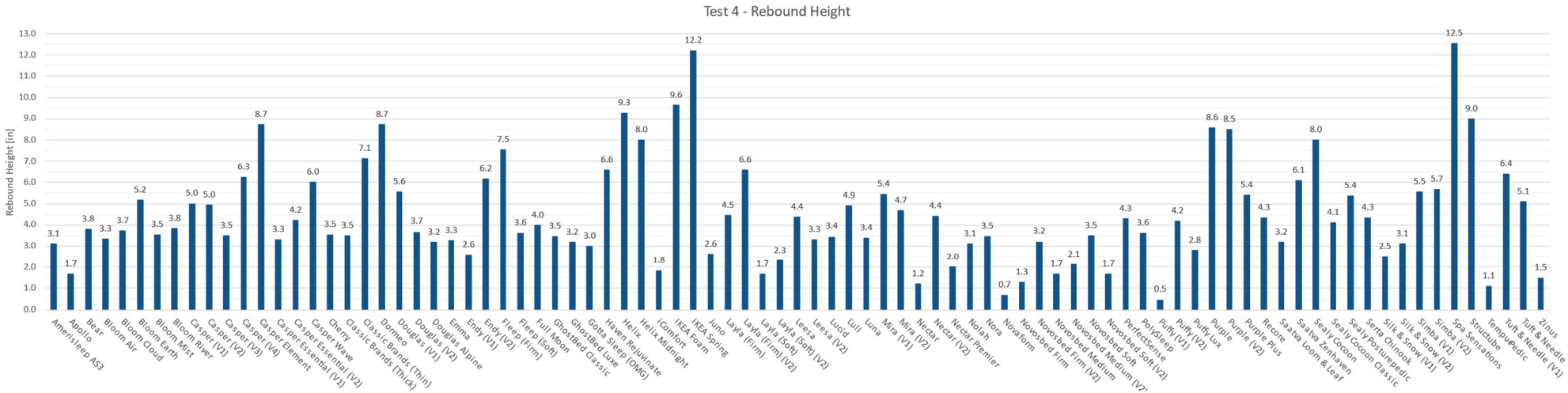


Figure 23: Test 4 - Rebound height of Reference Load 2 when dropped in the center of the mattress. Values shown are an average of 3 runs per mattress.

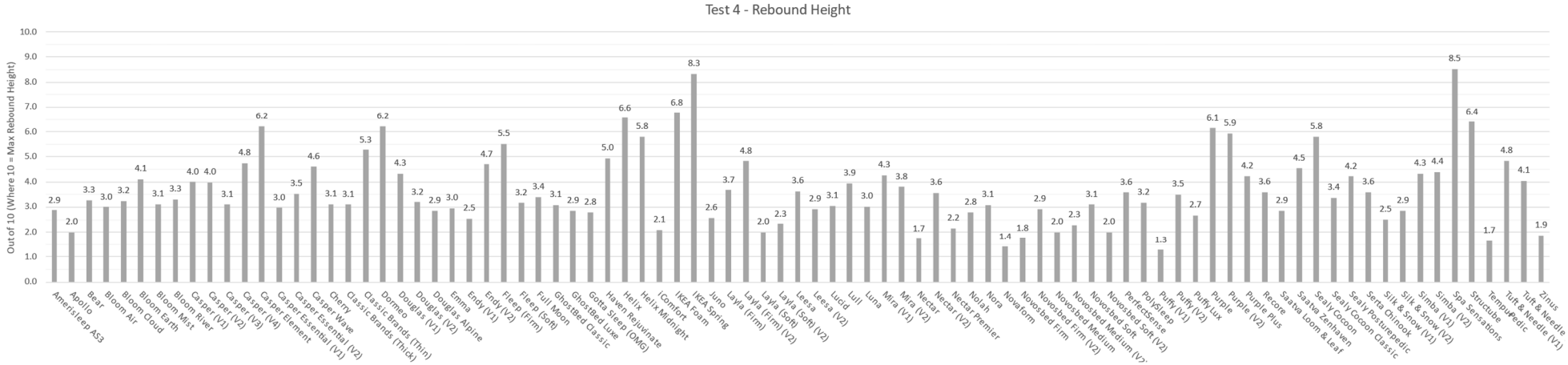


Figure 24: Test 4 – Rebound height on a scale from 1 to 10 based on the given mattresses that were sampled (where 10 = max rebound height)

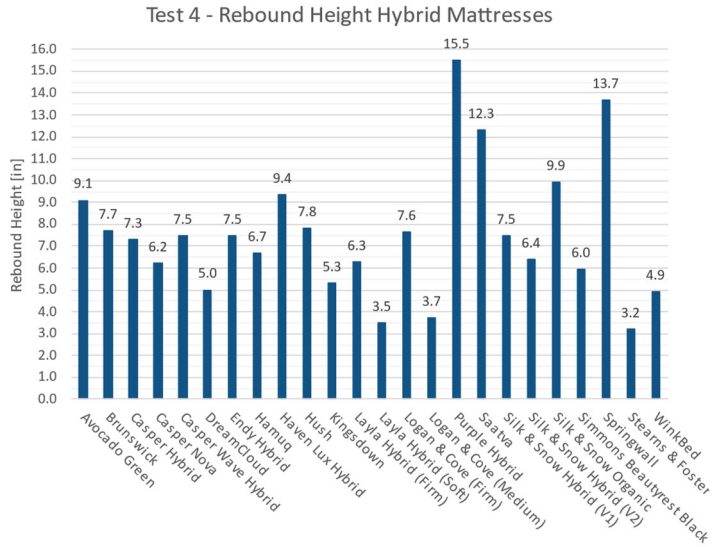


Figure 25: Test 4 - Rebound height of Reference Load 2 when dropped in the center of the mattress. Values shown are an average of 3 runs per mattress. Hybrid mattresses.

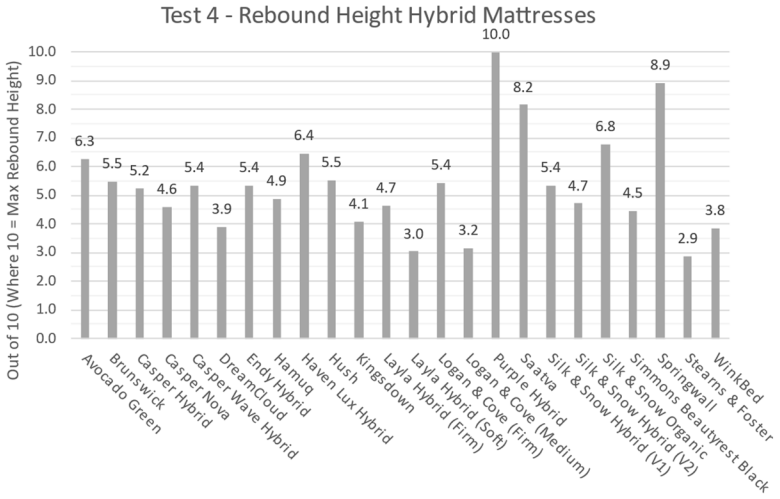


Figure 26: Test 4 – Rebound height on a scale from 1 to 10 based on the given mattresses that were sampled (where 10 = max rebound height). Hybrid mattresses.

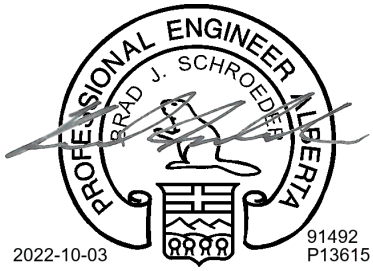
CONCLUSION

We trust that the above and attached information is satisfactory. Please do not hesitate to contact the undersigned if you have any questions or require further information.

Sincerely,

Techtree Engineering Ltd.

Brad Schroeder, P.Eng.



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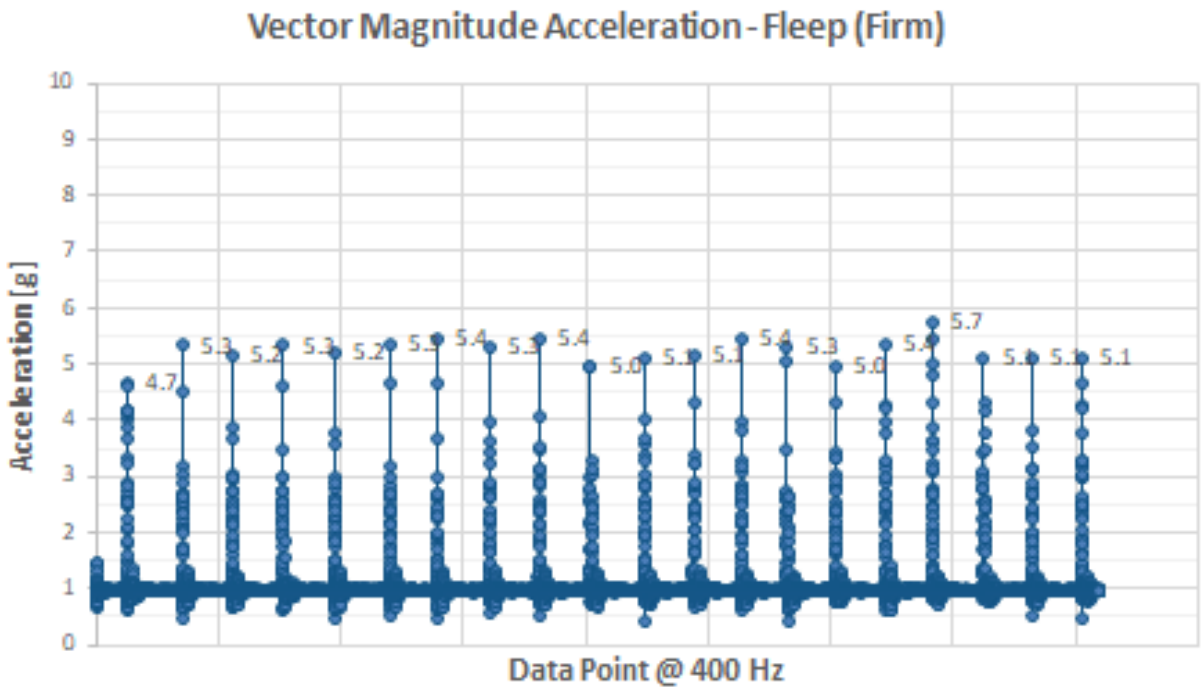
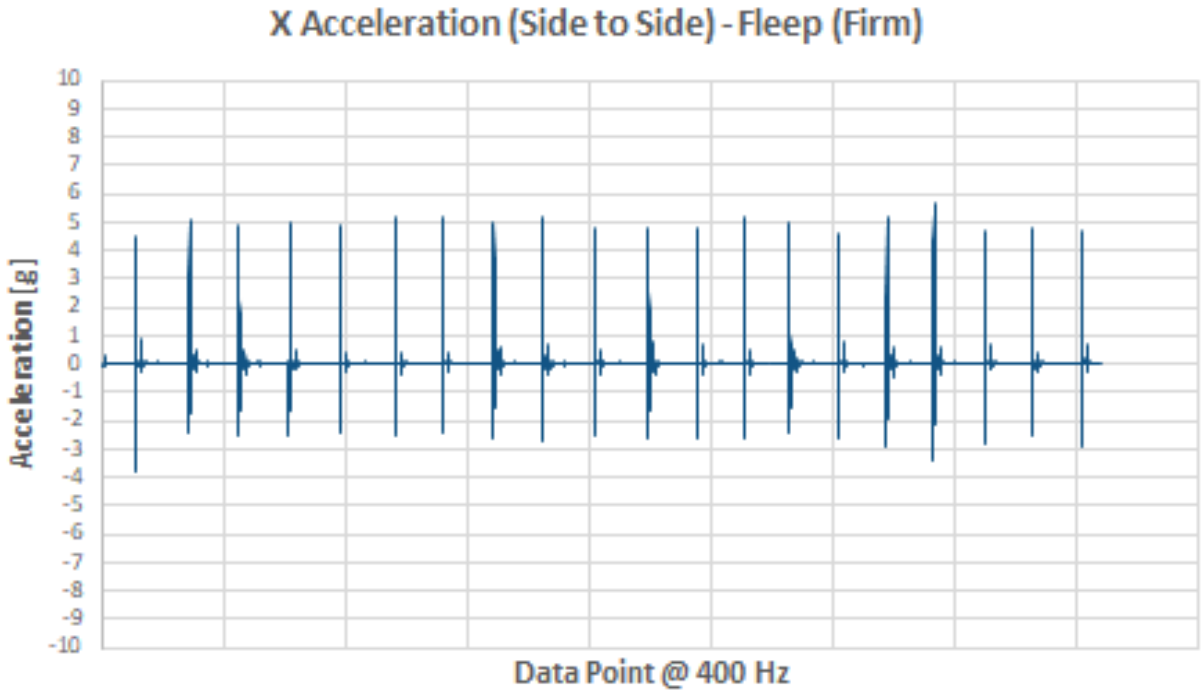
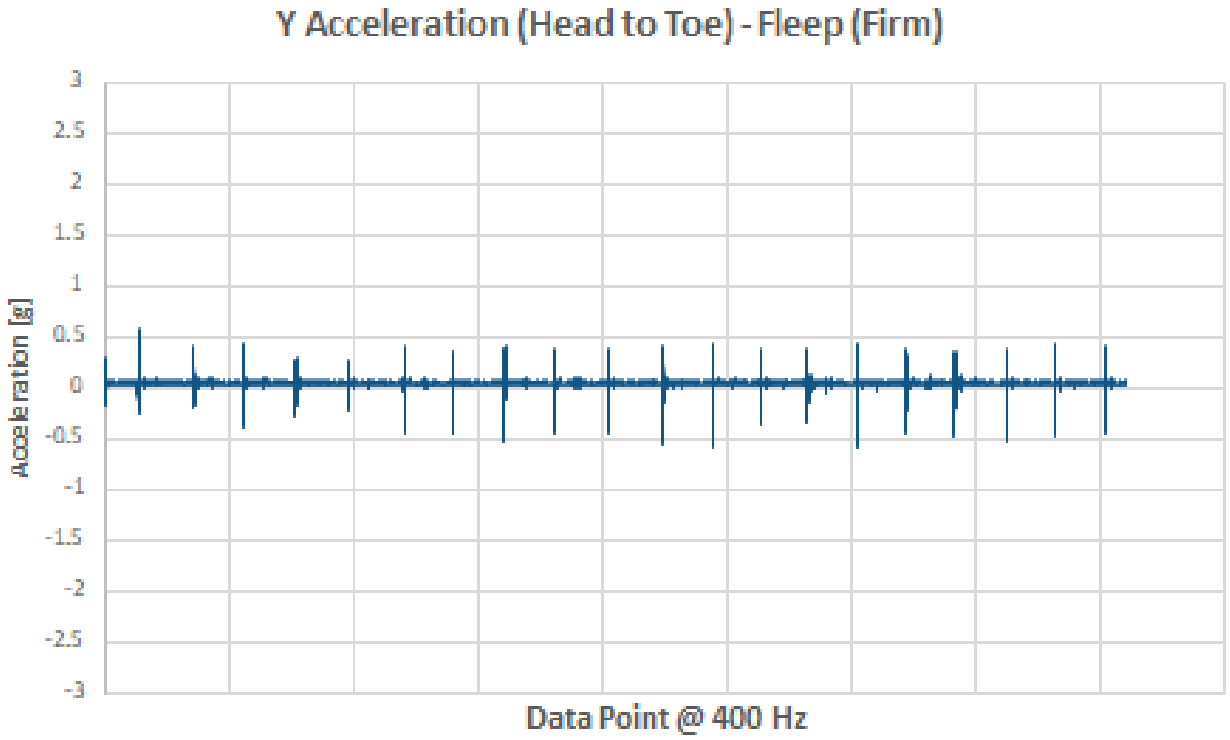
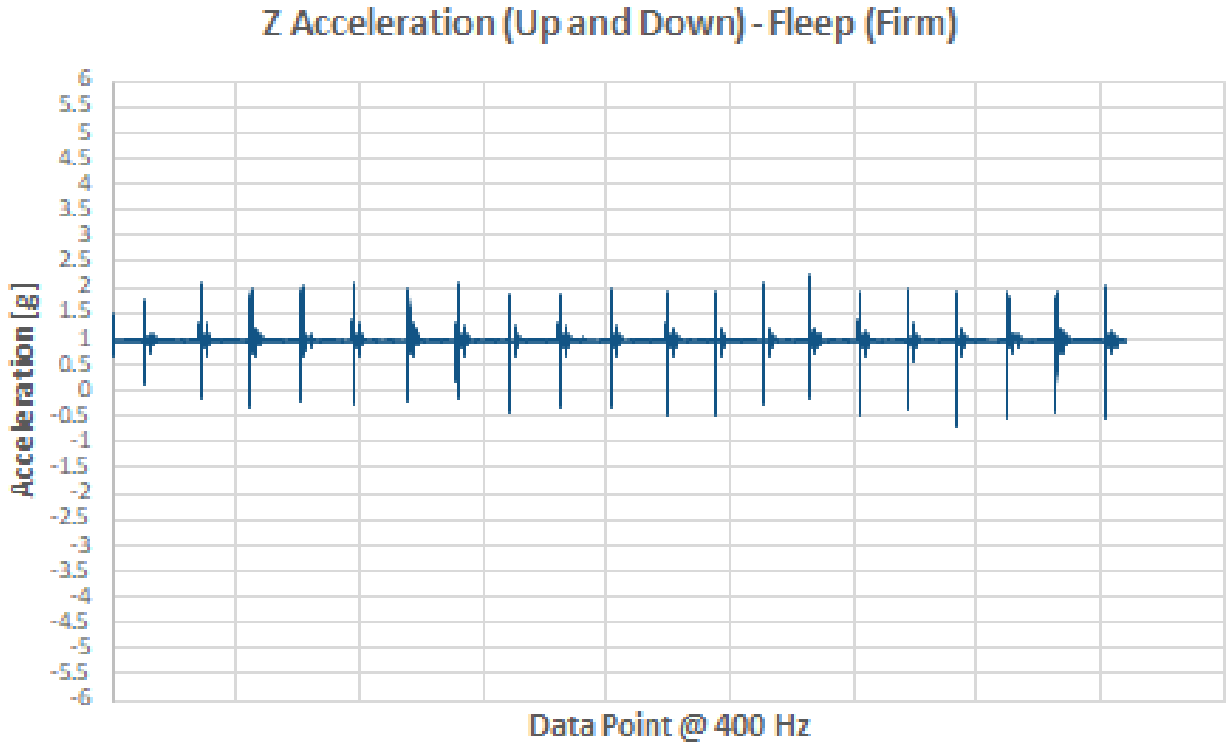
TEST 3 – FLEEP (FIRM)

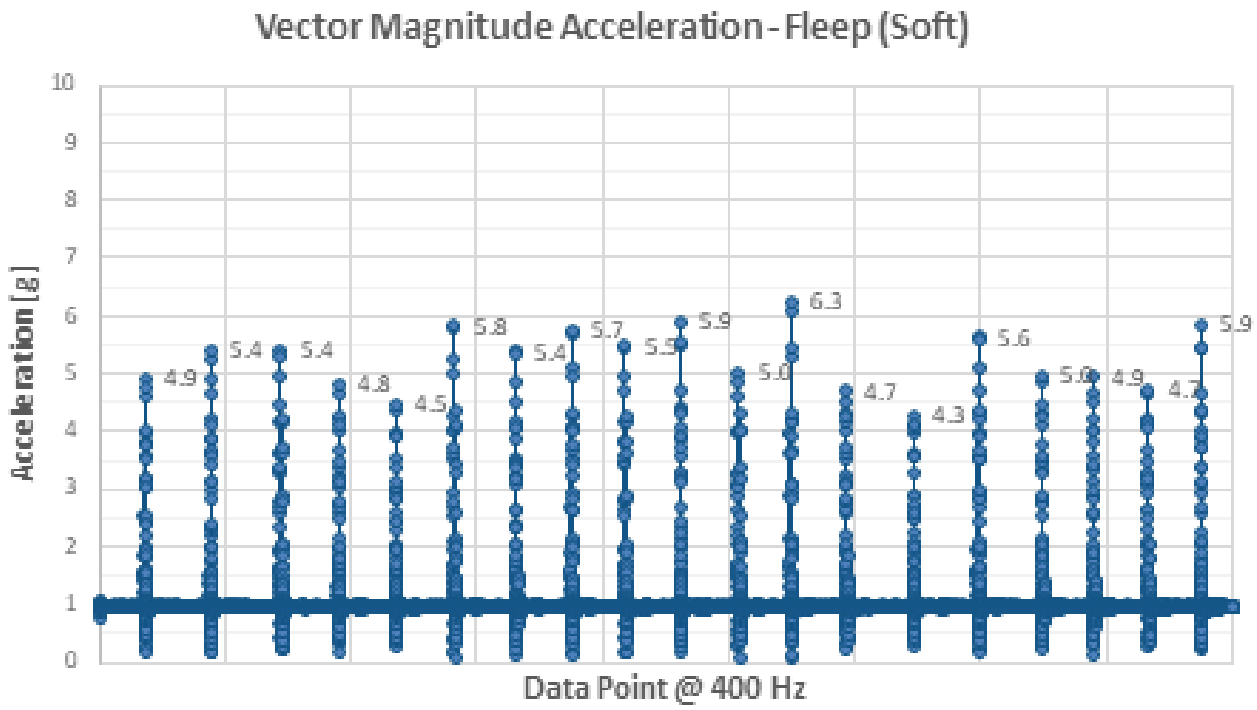


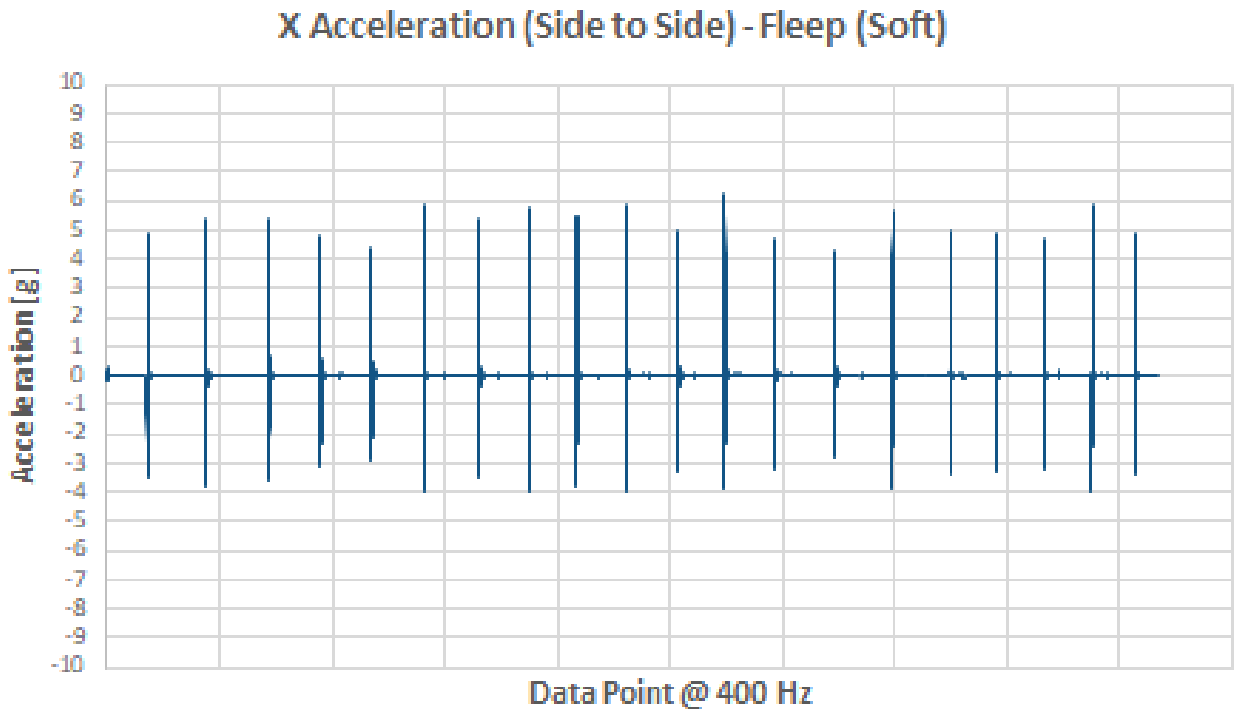


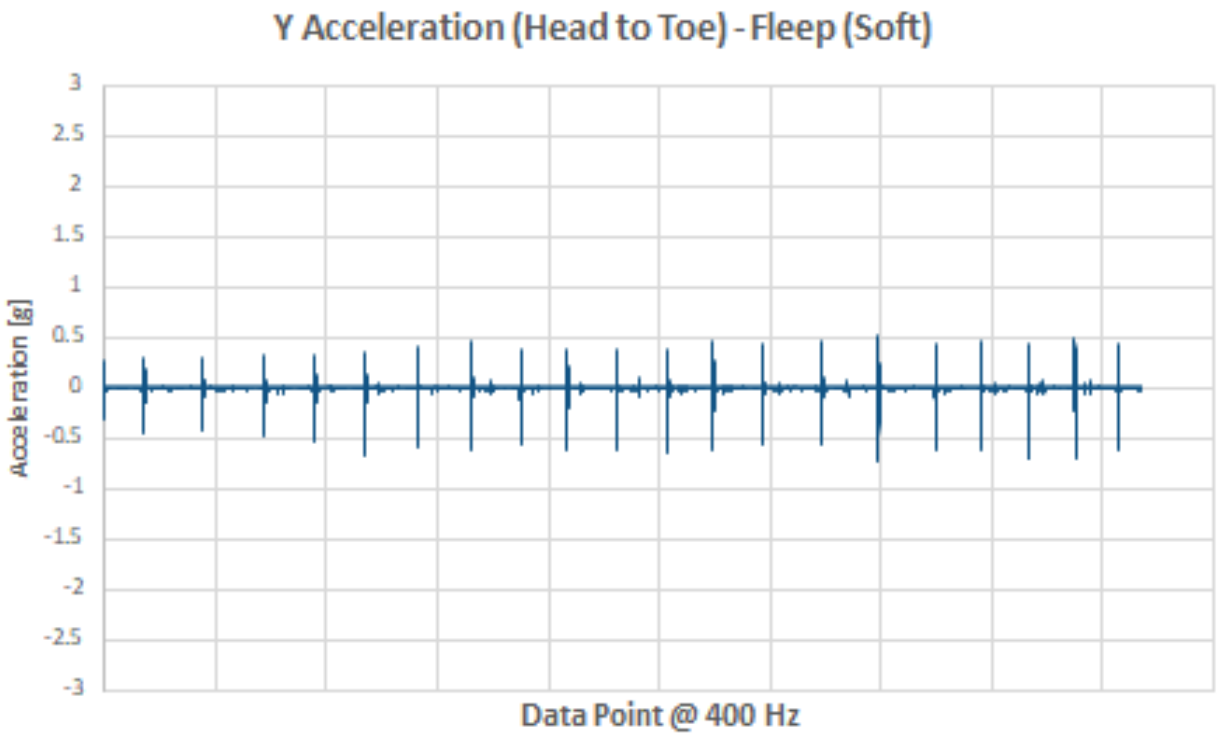

Y Acceleration (Head to Toe) - Fleep (Firm)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

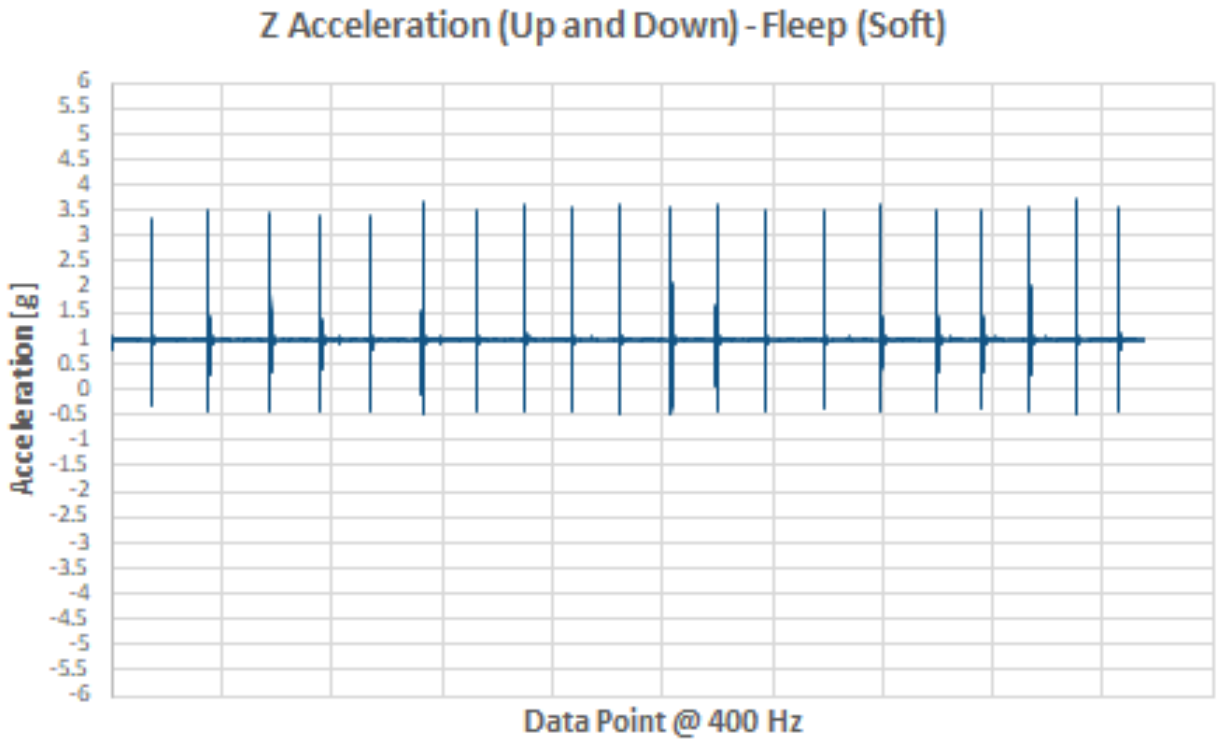

Z Acceleration (Up and Down) - Fleep (Firm)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – FLEEP (SOFT)

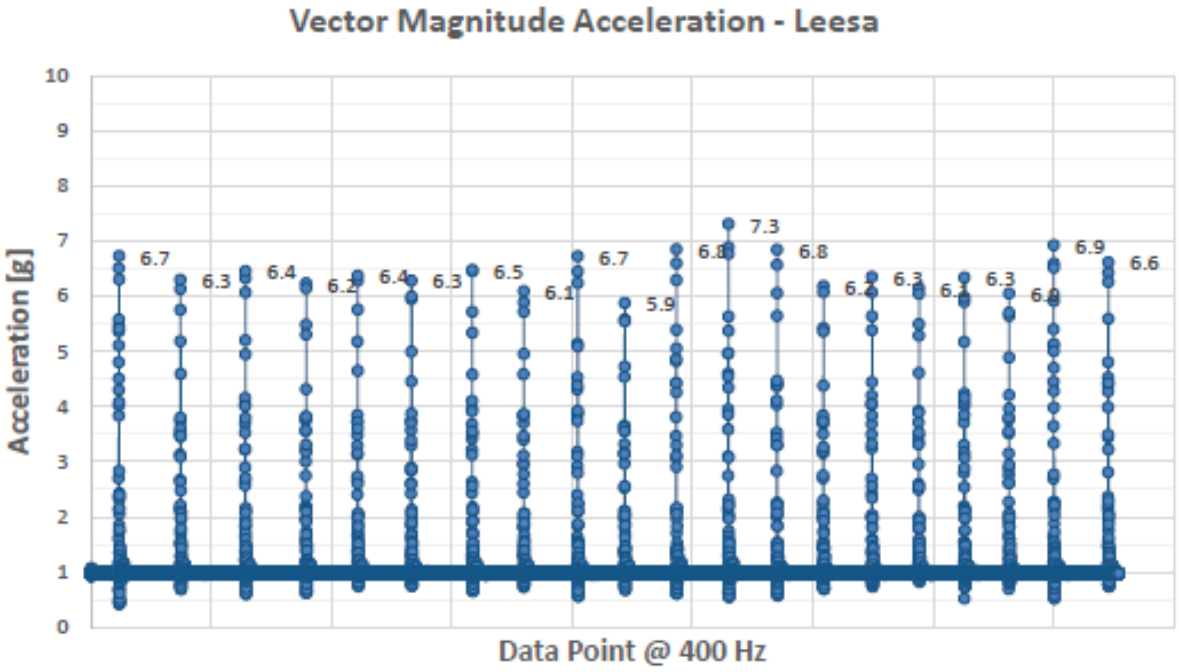


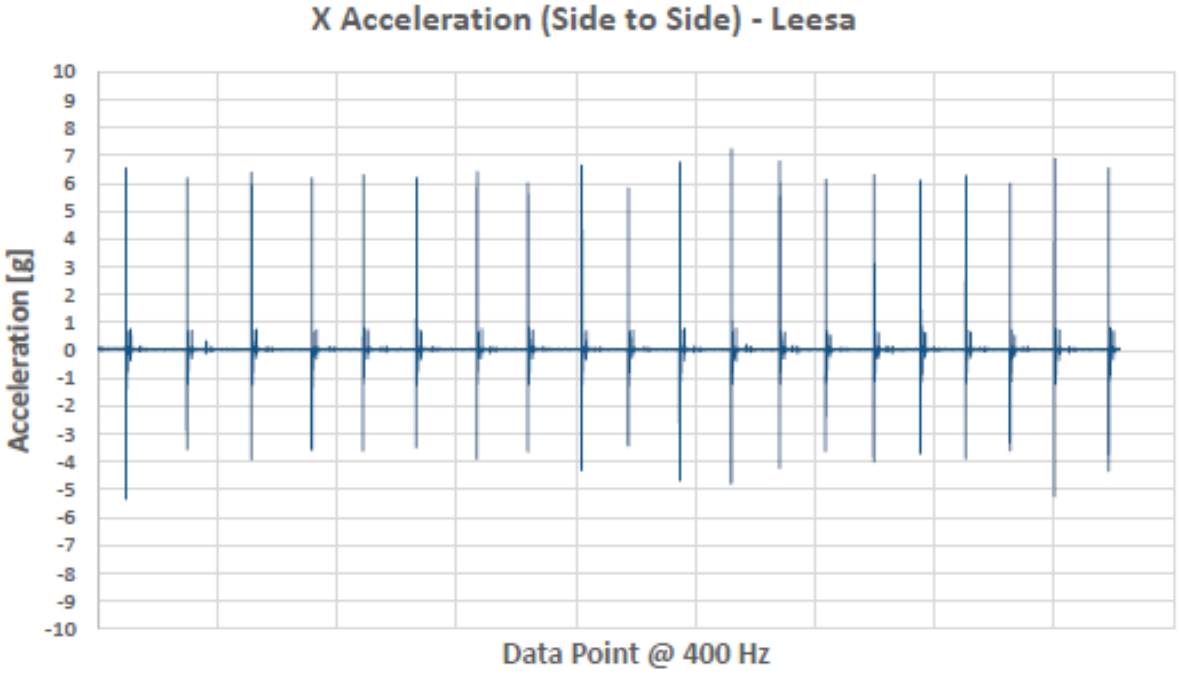


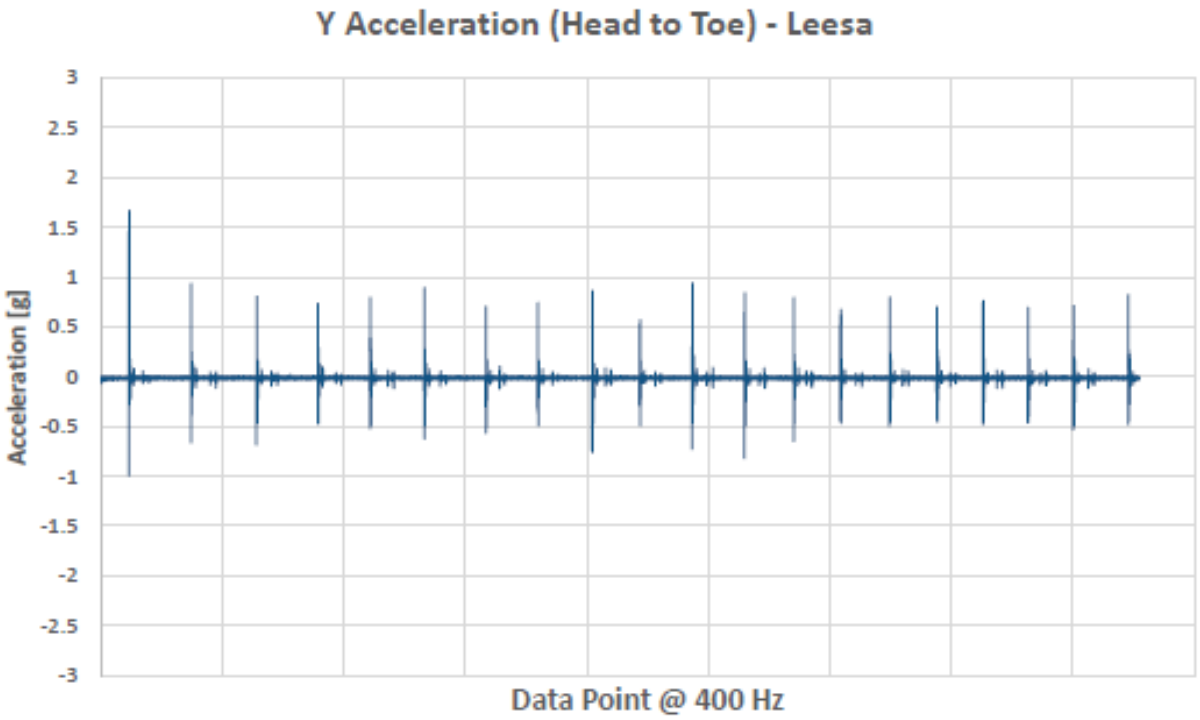

Y Acceleration (Head to Toe) - Fleep (Soft)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

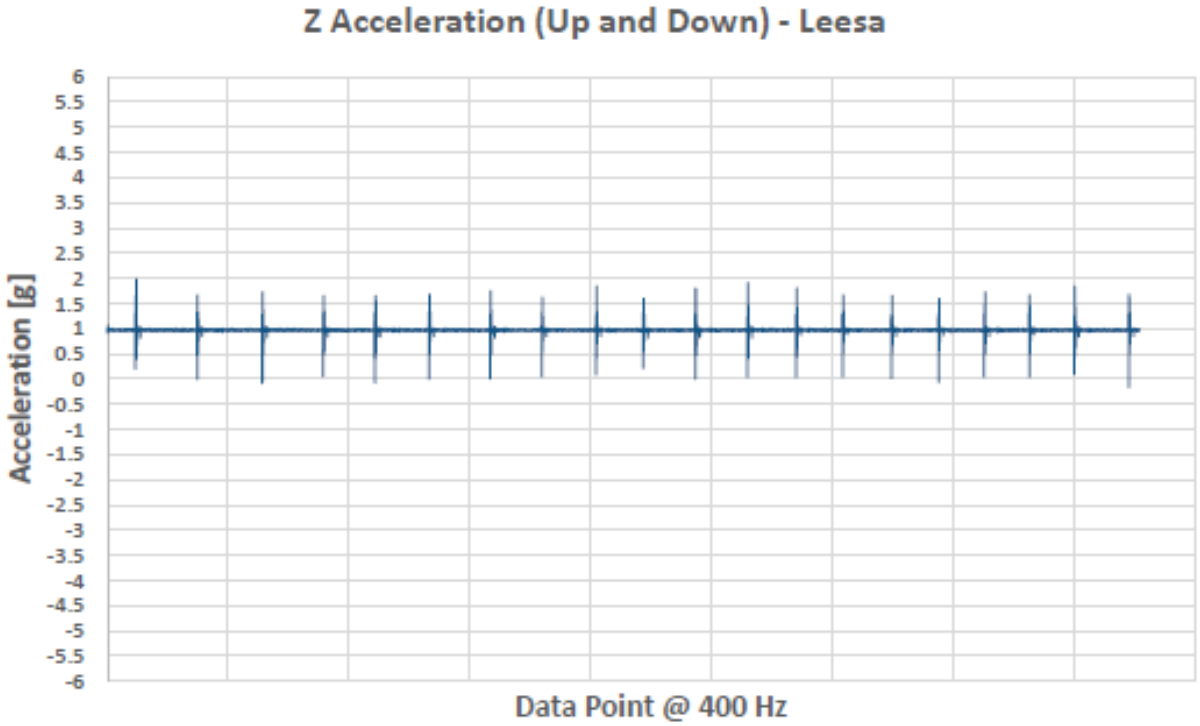

Z Acceleration (Up and Down) - Fleep (Soft)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – LEESA

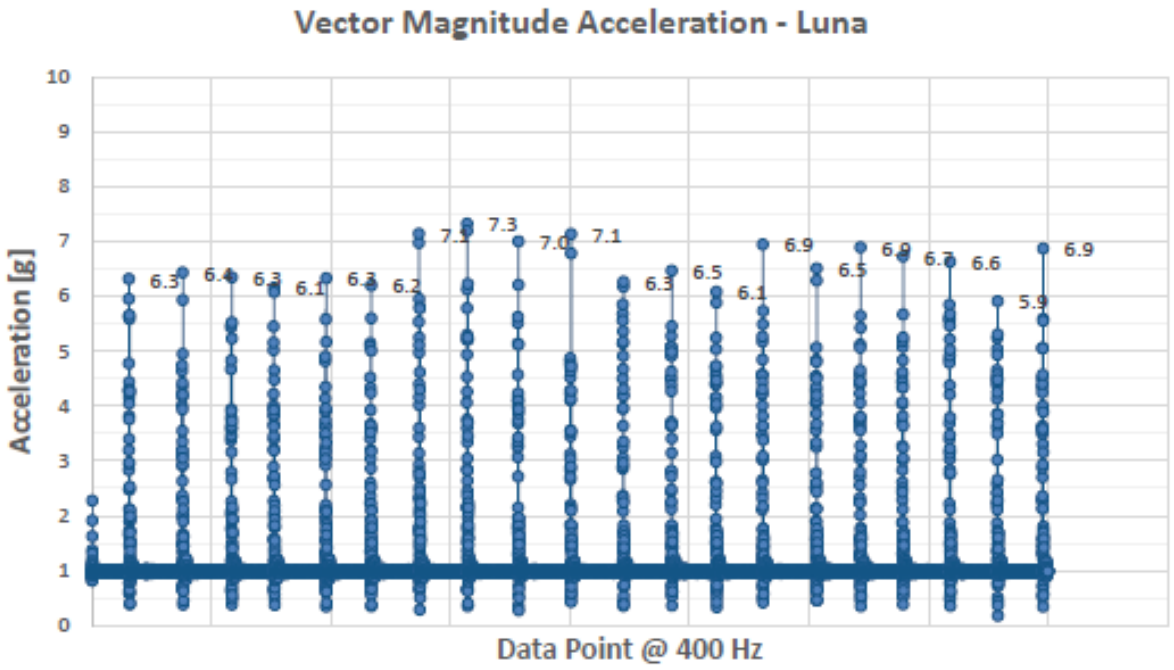

Vector Magnitude Acceleration - Leesa
Acceleration [g]
Data Point @ 400 Hz
6.7
6.3
6.4
6.2
6.4
6.3
6.5
6.1
6.7
5.9
6.8
7.3
6.8
6.2
6.3
6.1
6.3
6.8
6.9
6.6

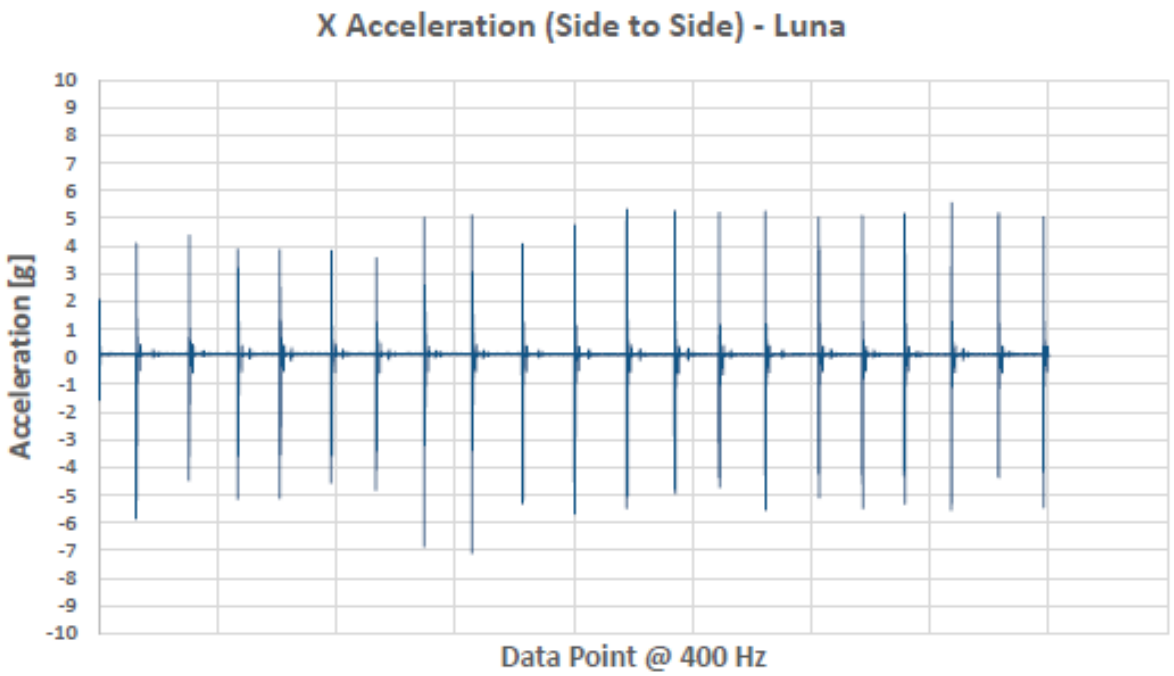

X Acceleration (Side to Side) - Leesa
Acceleration [g]
Data Point @ 400 Hz

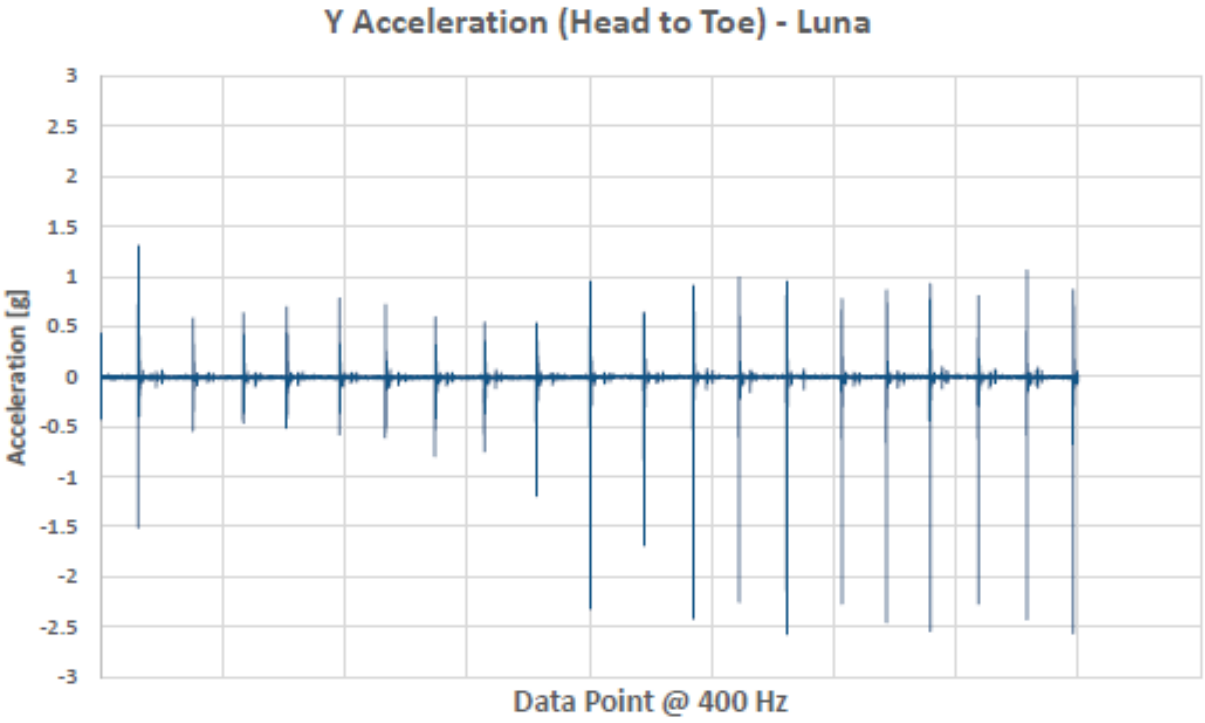

Y Acceleration (Head to Toe) - Leesa
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

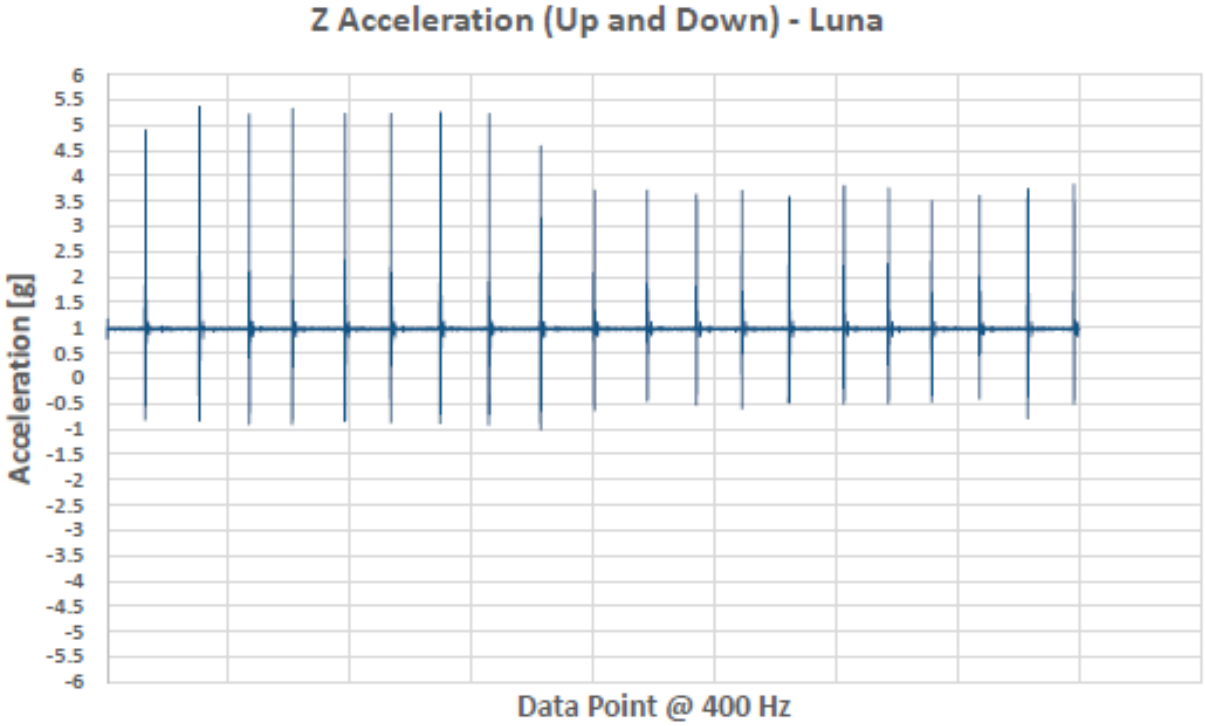

Z Acceleration (Up and Down) - Leesa
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – LUNA

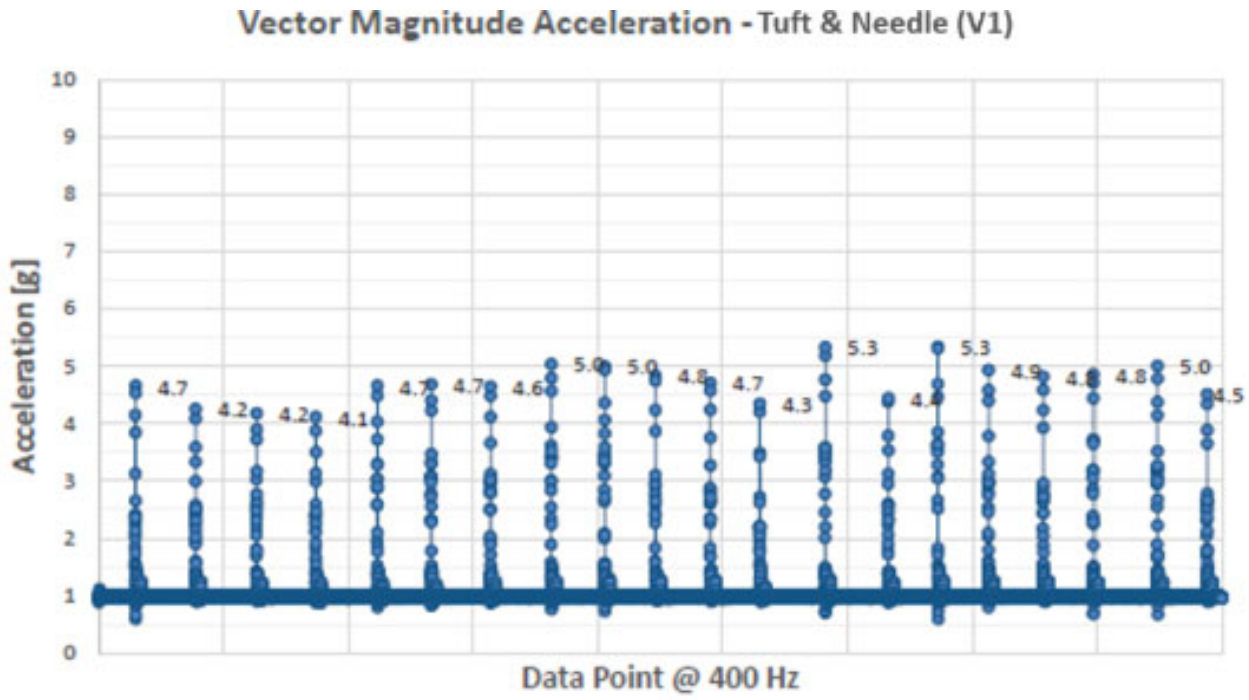

Vector Magnitude Acceleration - Luna
Acceleration [g]
Data Point @ 400 Hz
6.3
6.4
6.3
6.1
6.3
6.2
7.1
7.3
7.0
7.1
6.3
6.5
6.1
6.9
6.5
6.9
6.7
6.6
5.9
6.9

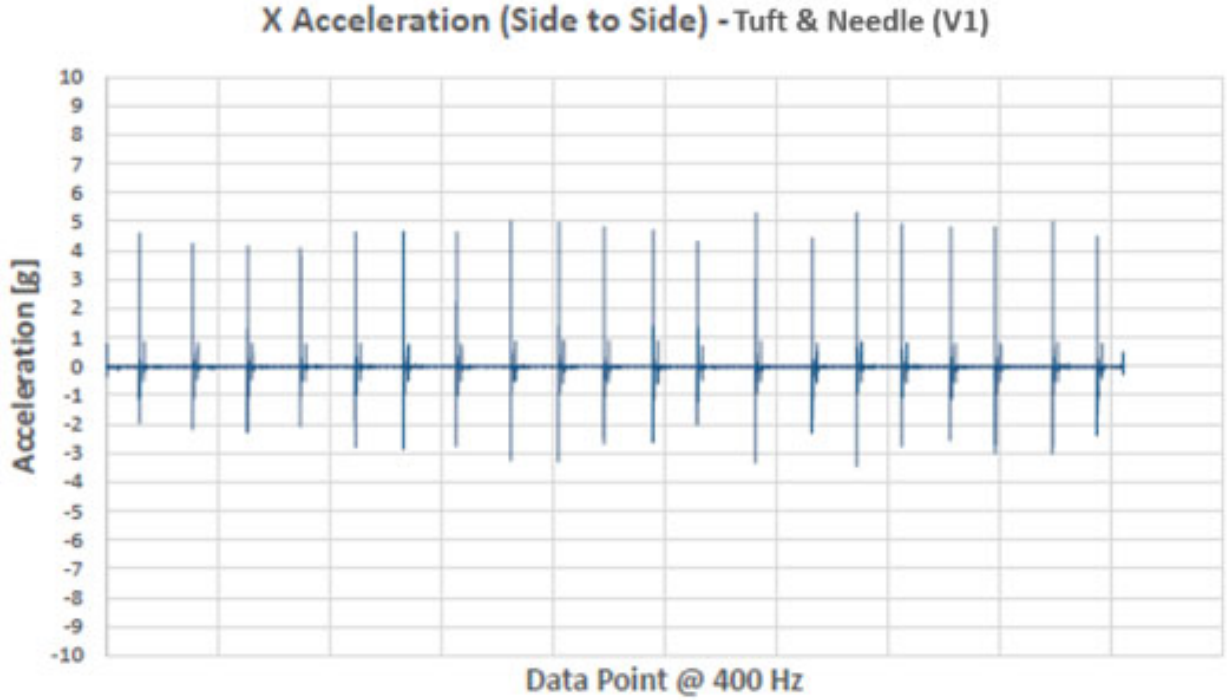

X Acceleration (Side to Side) - Luna
Acceleration [g]
Data Point @ 400 Hz

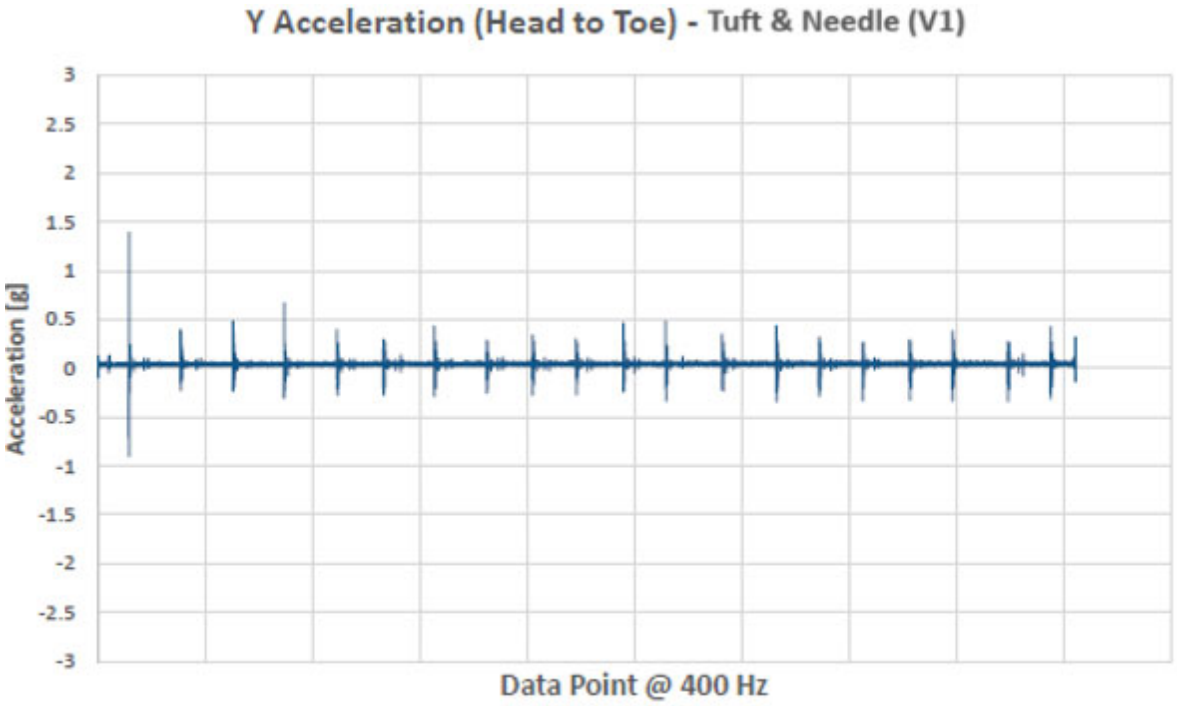

Y Acceleration (Head to Toe) - Luna
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

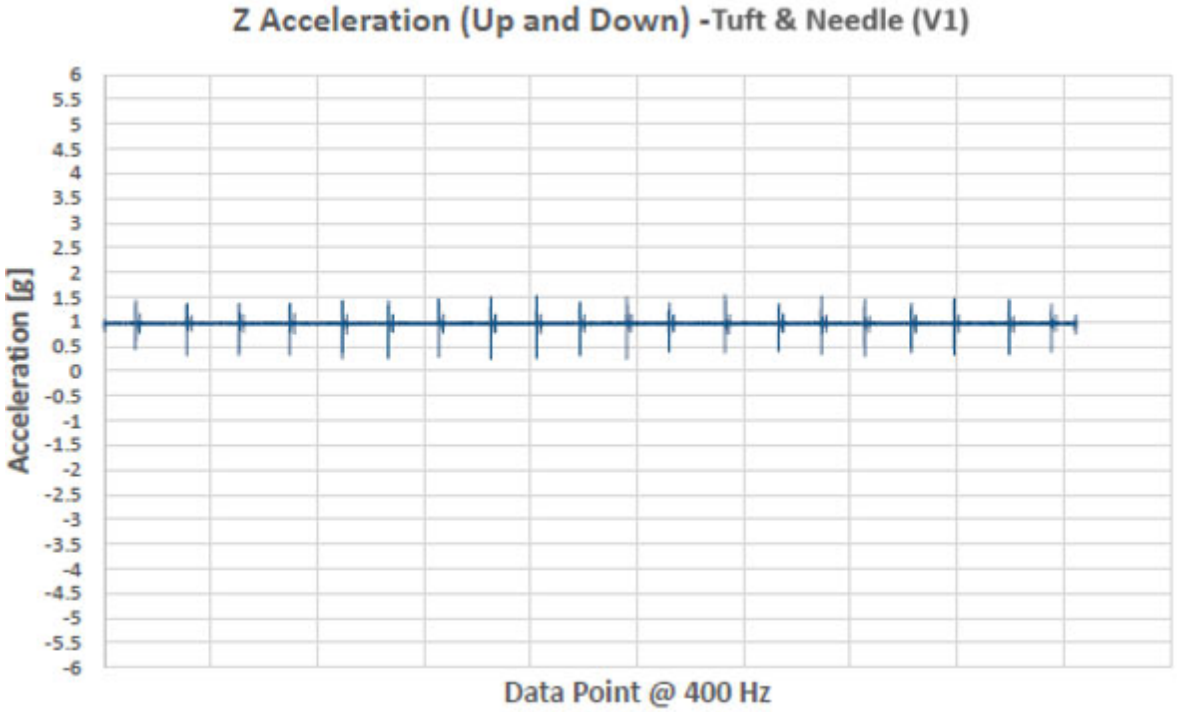

Z Acceleration (Up and Down) - Luna
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – TUFT & NEEDLE (V1)

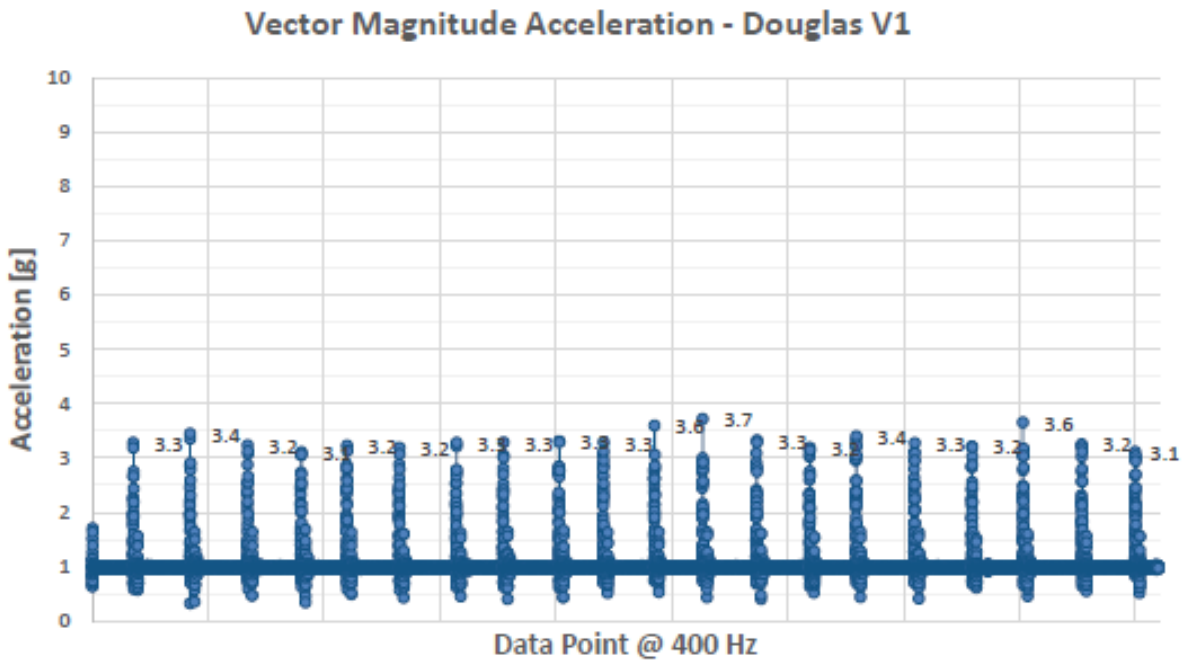


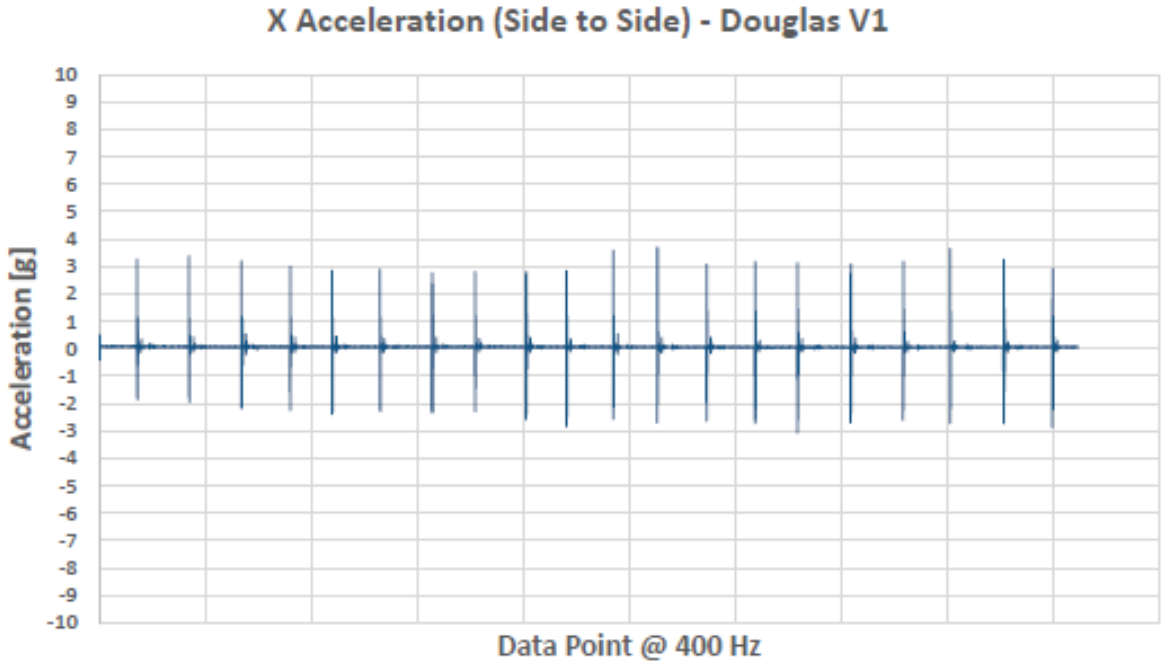


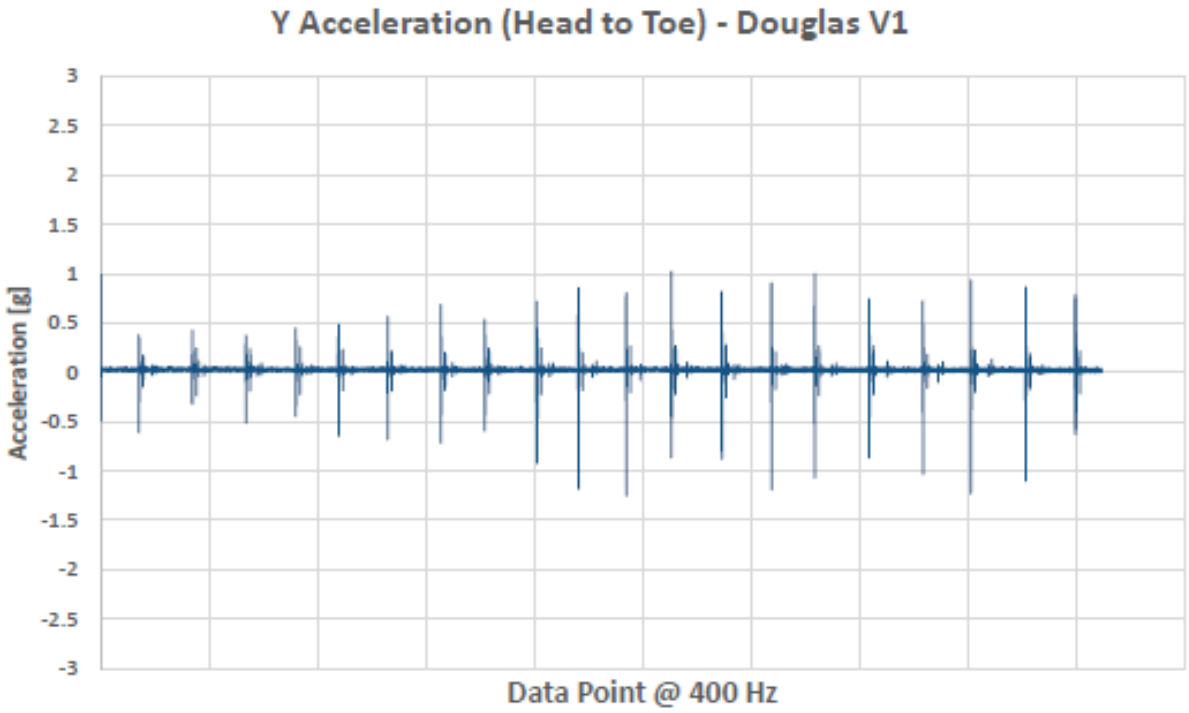

Y Acceleration (Head to Toe) - Tuft & Needle (V1)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

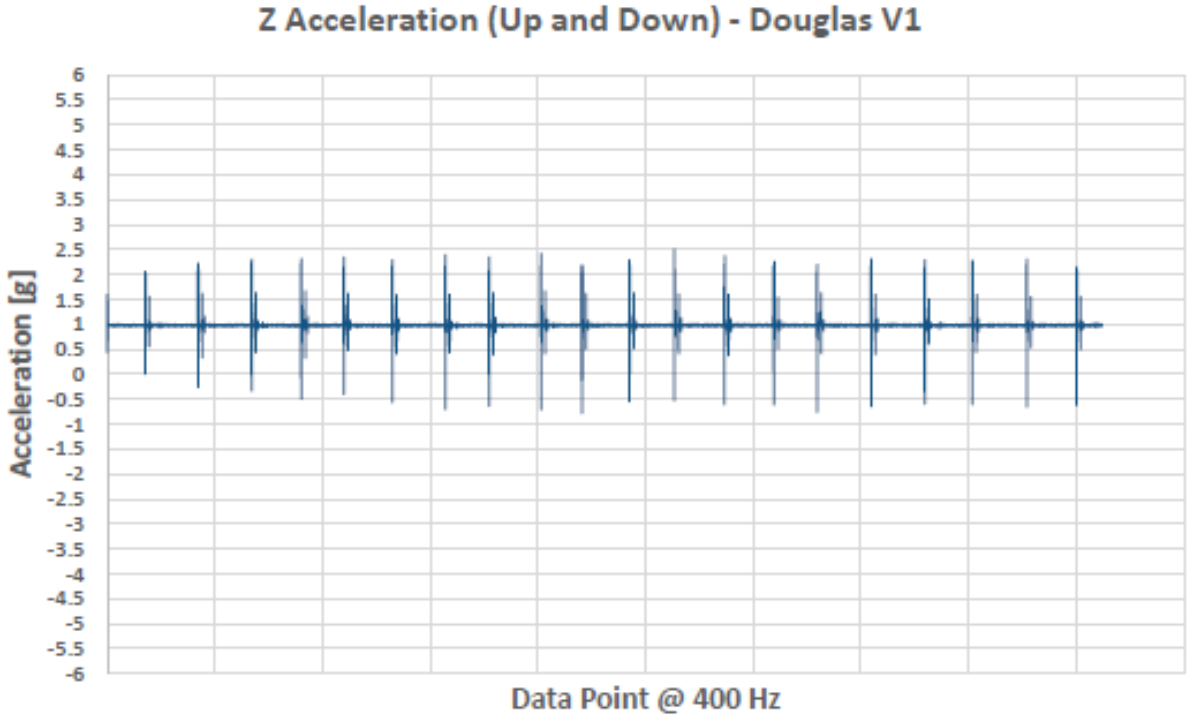

Z Acceleration (Up and Down) -Tuft & Needle (V1)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – DOUGLAS (V1)

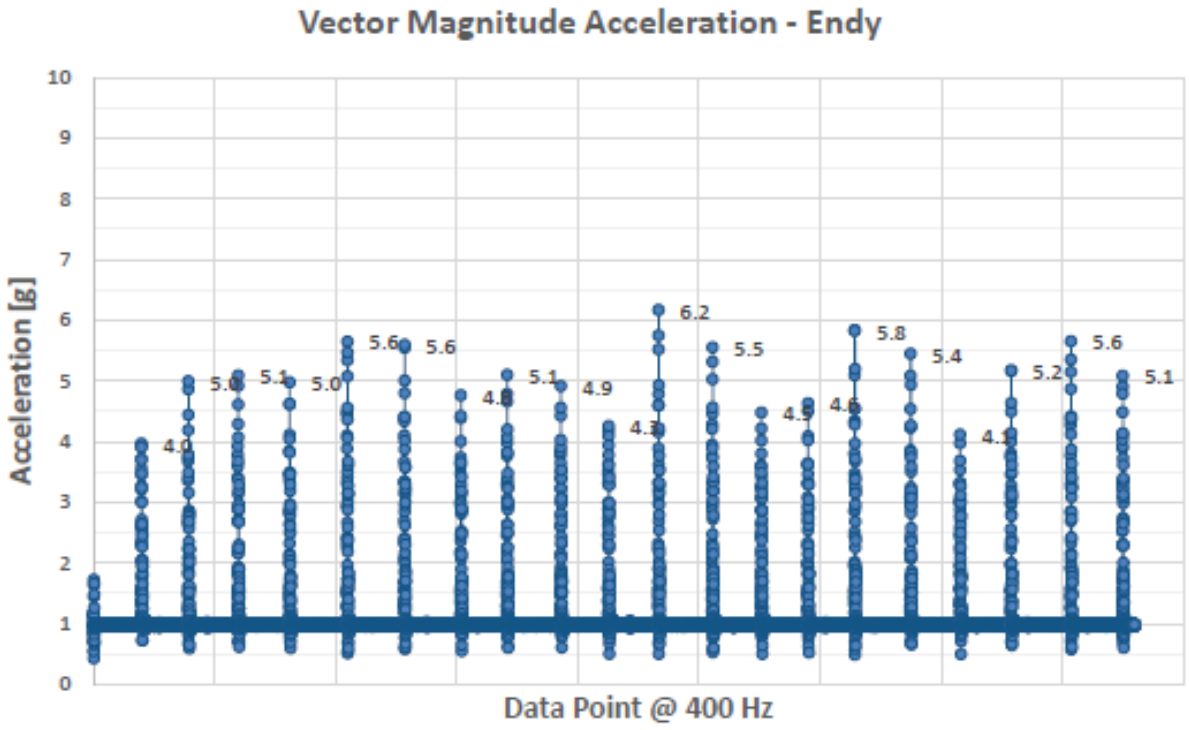


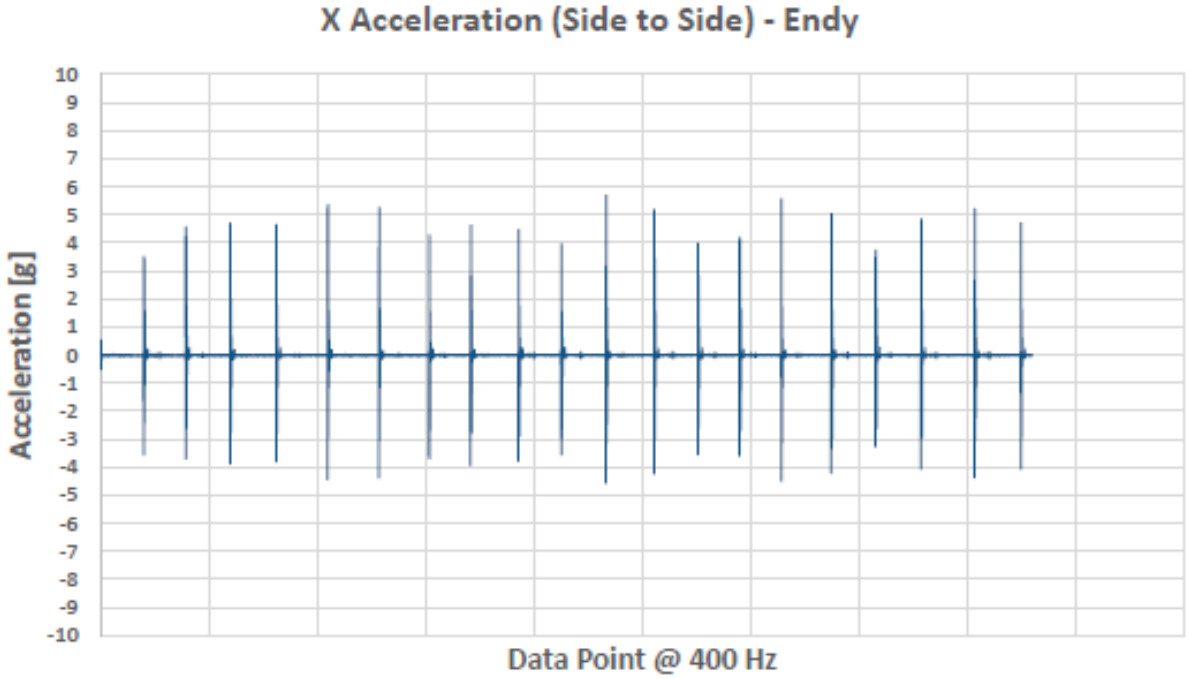


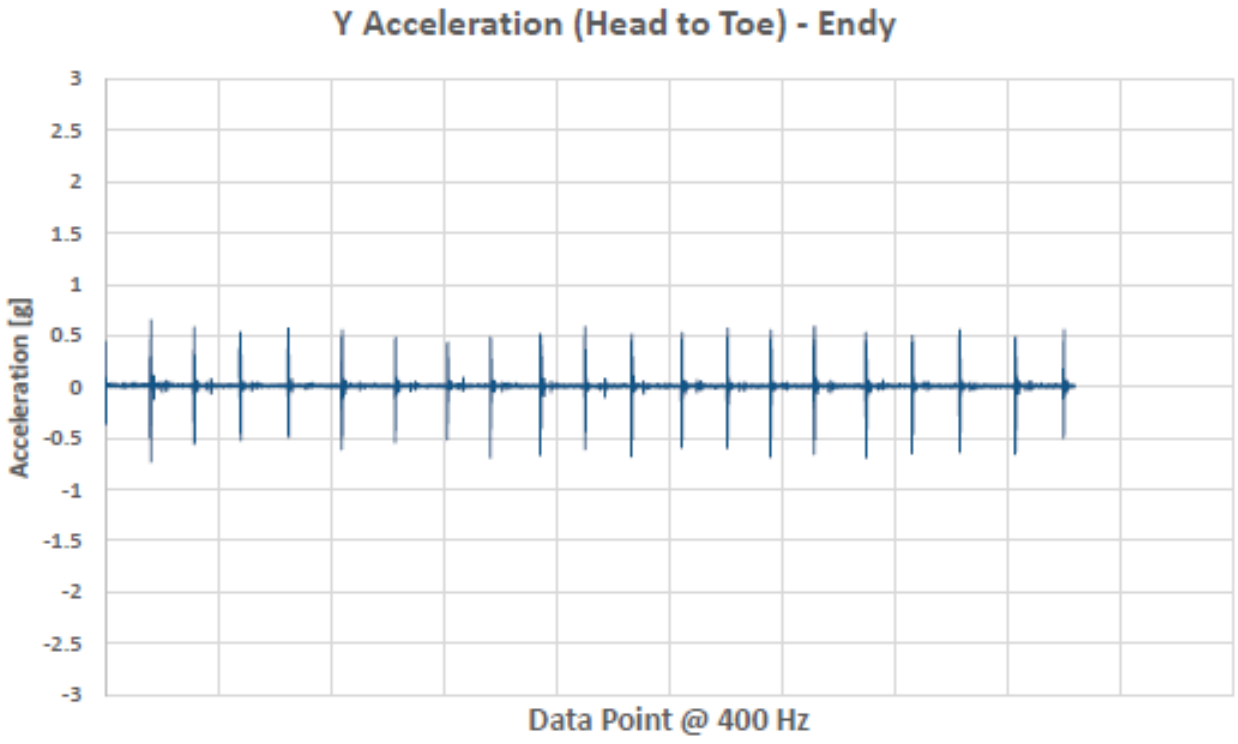

Y Acceleration (Head to Toe) - Douglas V1
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

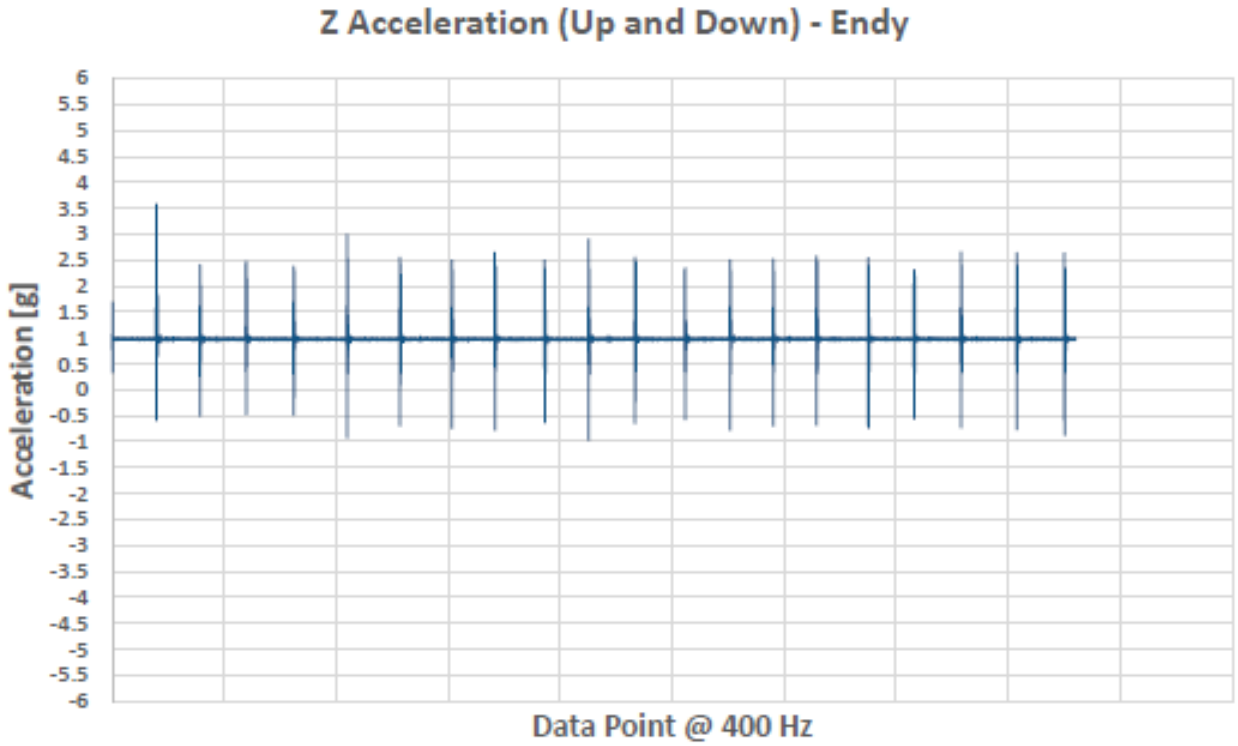

Z Acceleration (Up and Down) - Douglas V1
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – ENDY

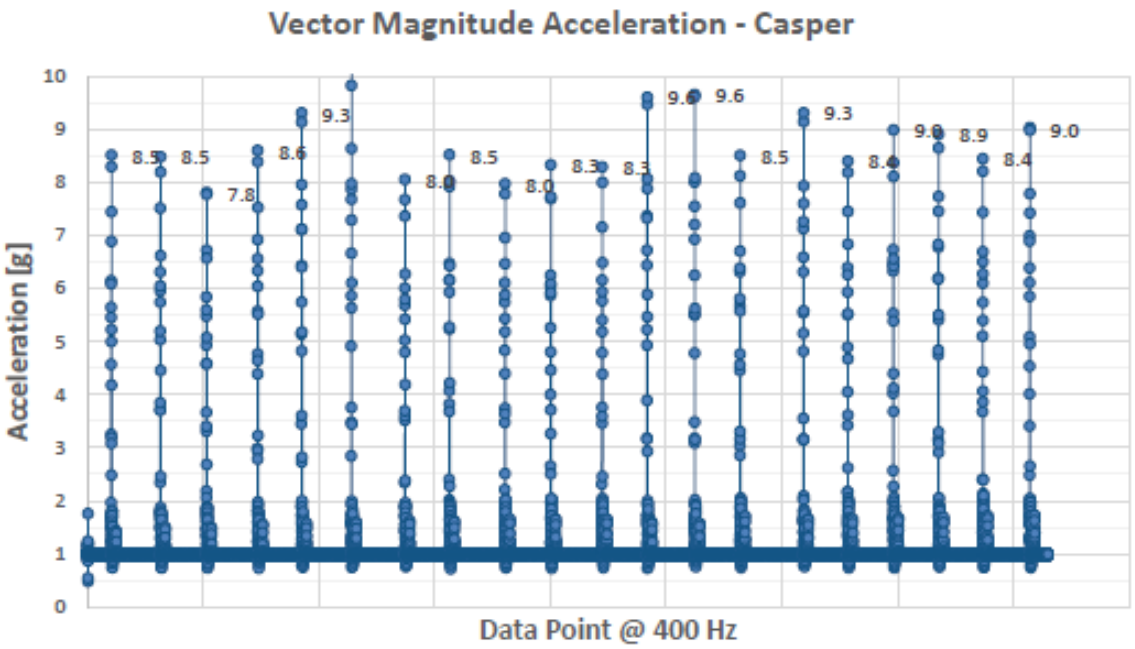

Vector Magnitude Acceleration - Endy
Acceleration [g]
Data Point @ 400 Hz
10
9
8
7
6
5
4
3
2
1
0
4.0
5.0
5.1
5.0
5.6
5.6
4.8
5.1
4.9
4.3
6.2
5.5
4.5
4.6
5.8
5.4
4.1
5.2
5.6
5.1

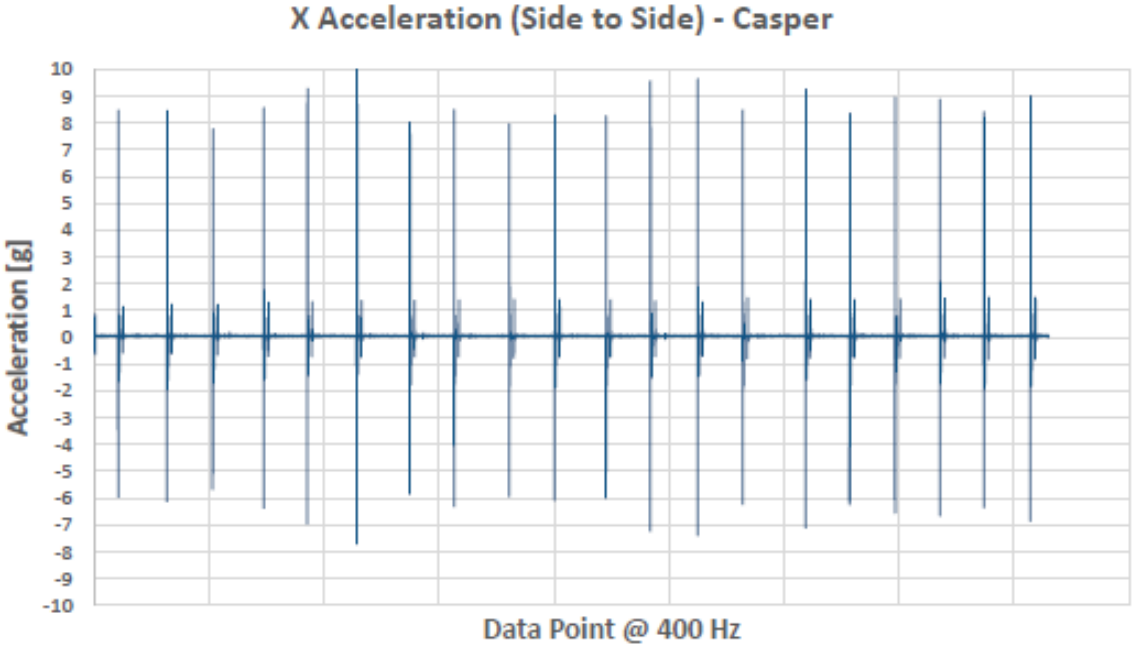

X Acceleration (Side to Side) - Endy
Acceleration [g]
Data Point @ 400 Hz
10
9
8
7
6
5
4
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10

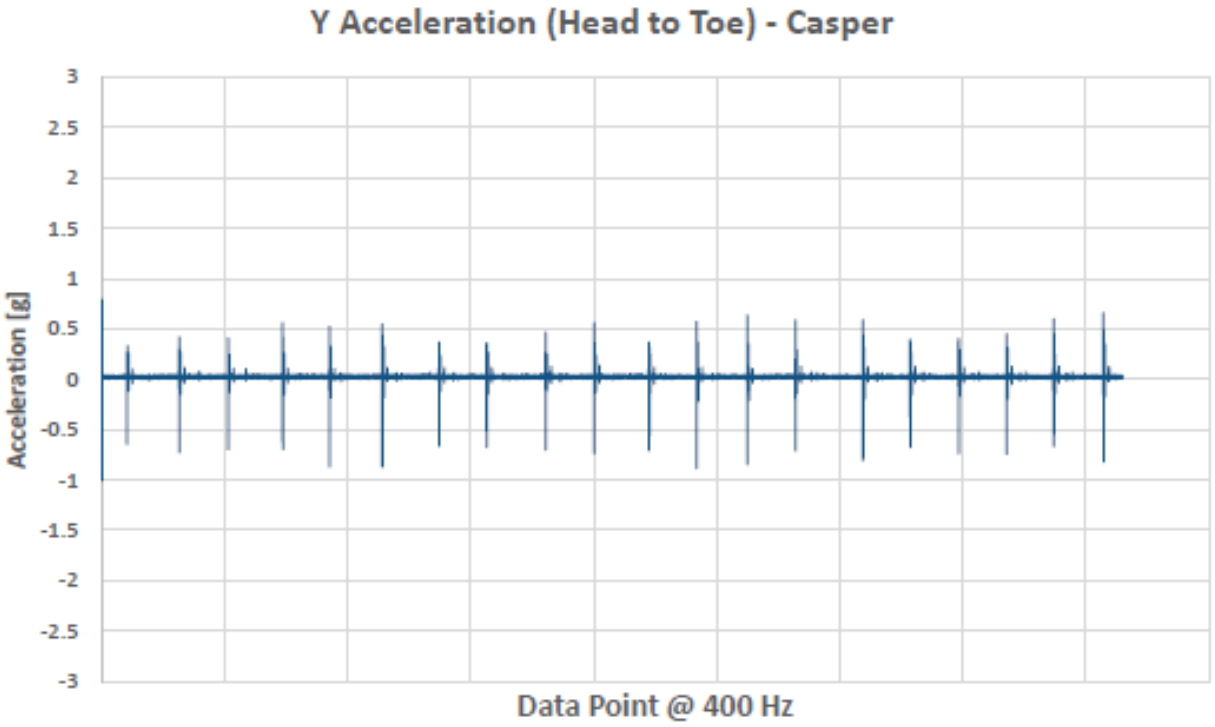

Y Acceleration (Head to Toe) - Endy
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

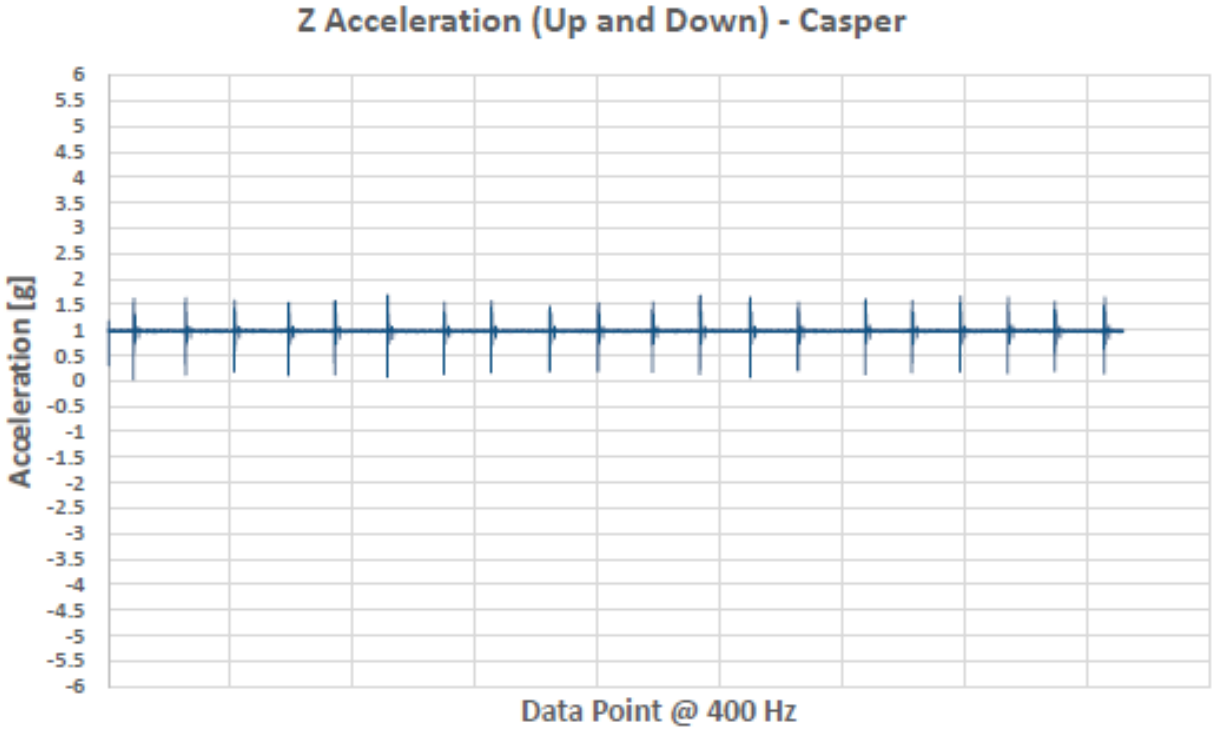

Z Acceleration (Up and Down) - Endy
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – CASPER

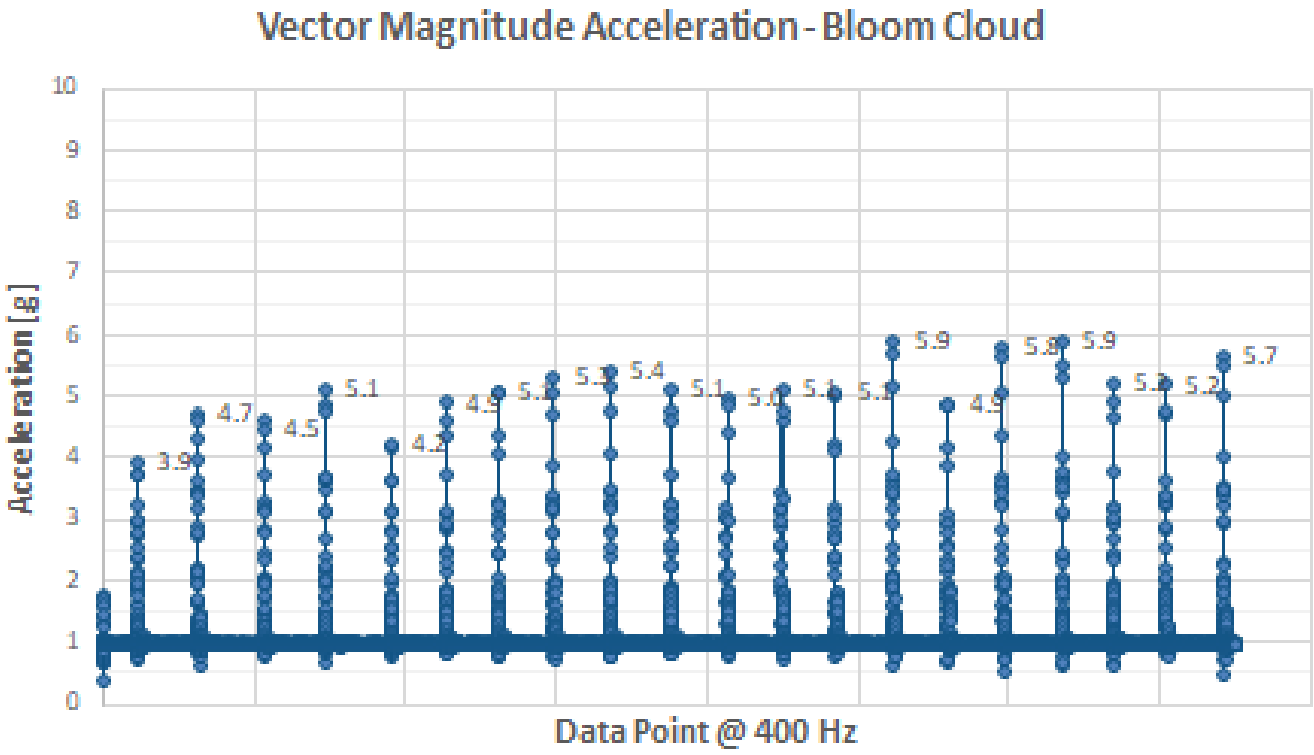


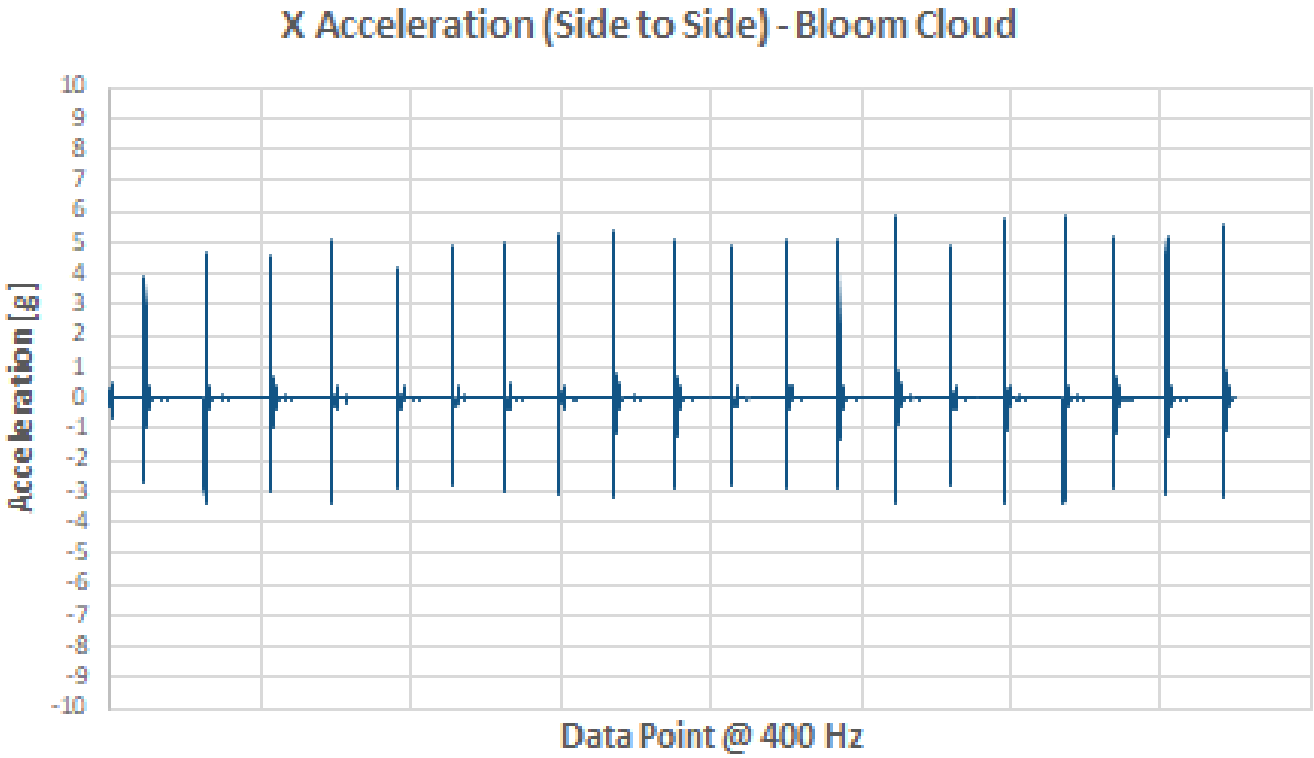


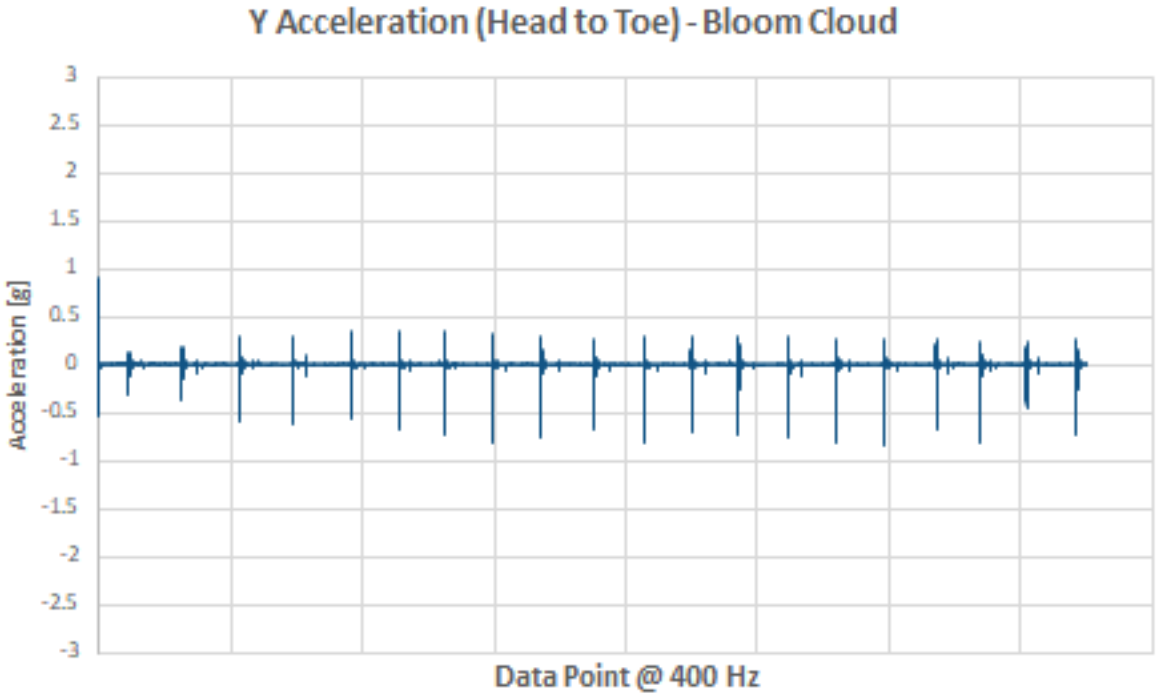

Y Acceleration (Head to Toe) - Casper
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

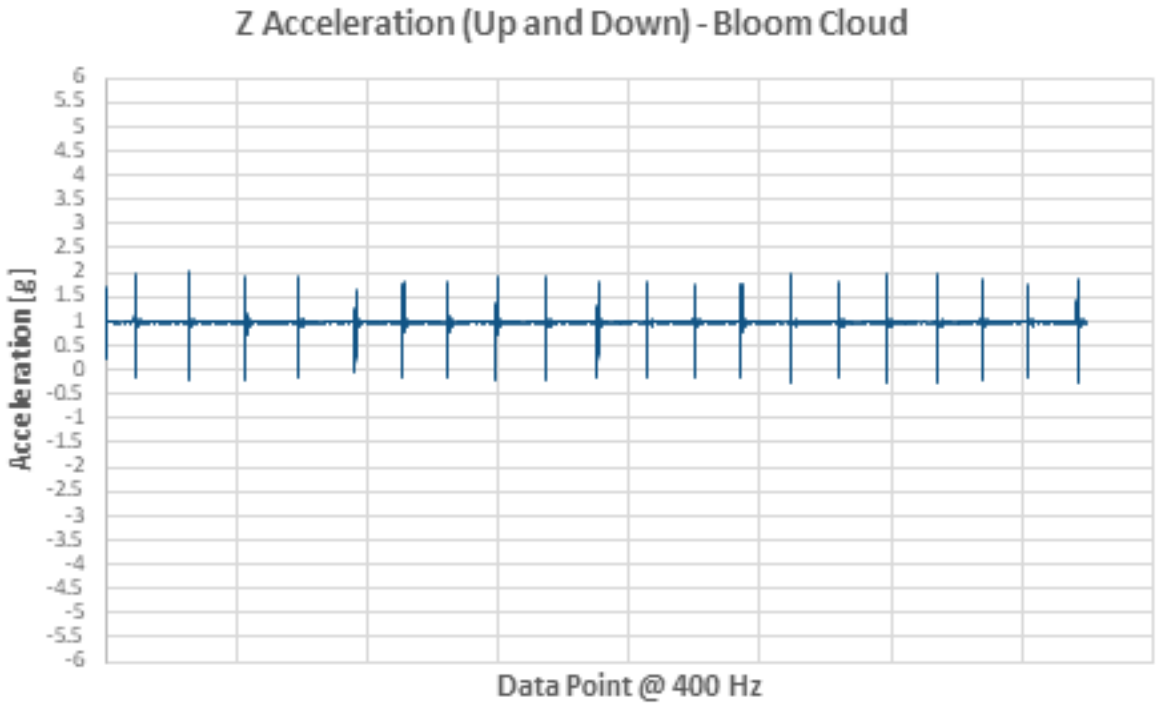

Z Acceleration (Up and Down) - Casper
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – BLOOM CLOUD

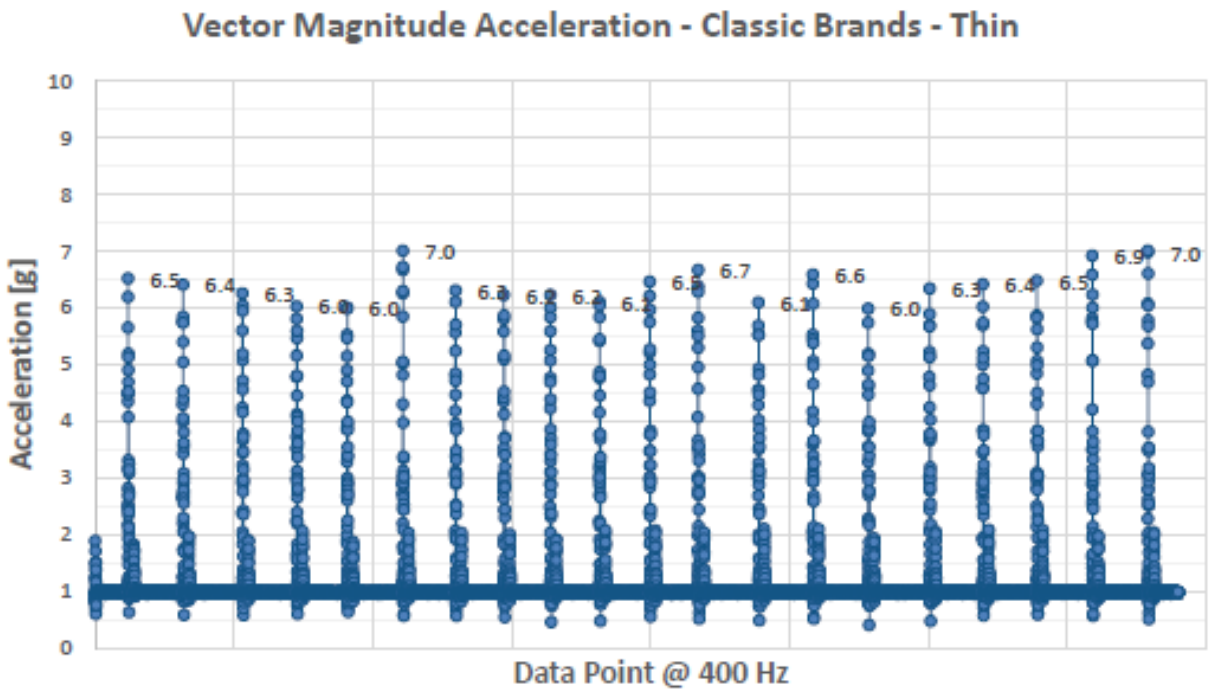


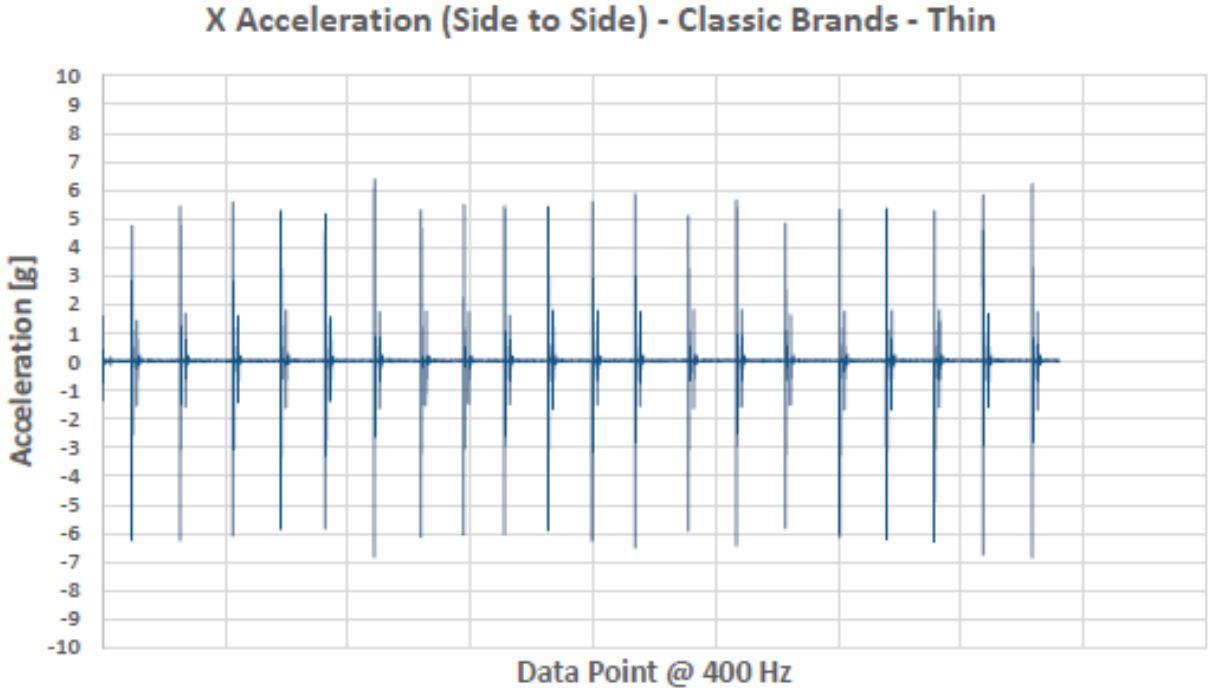


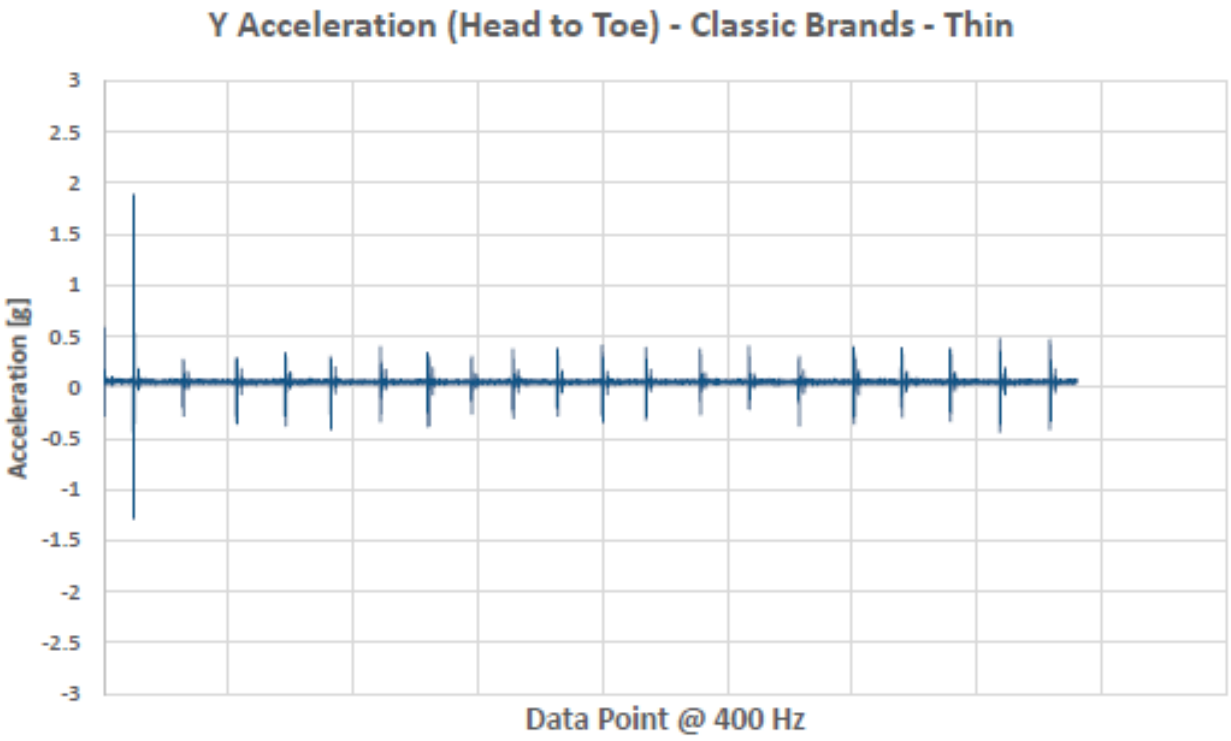

Y Acceleration (Head to Toe) - Bloom Cloud
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

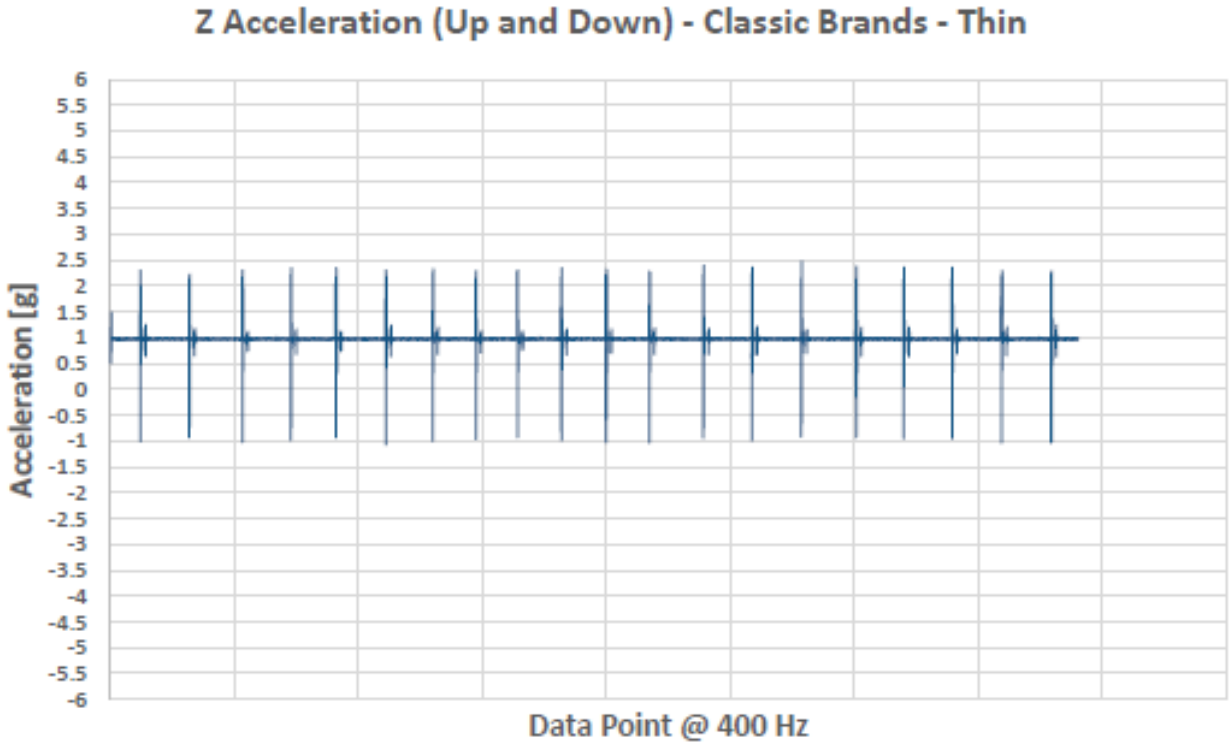

Z Acceleration (Up and Down) - Bloom Cloud
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – CLASSIC BRANDS – THIN

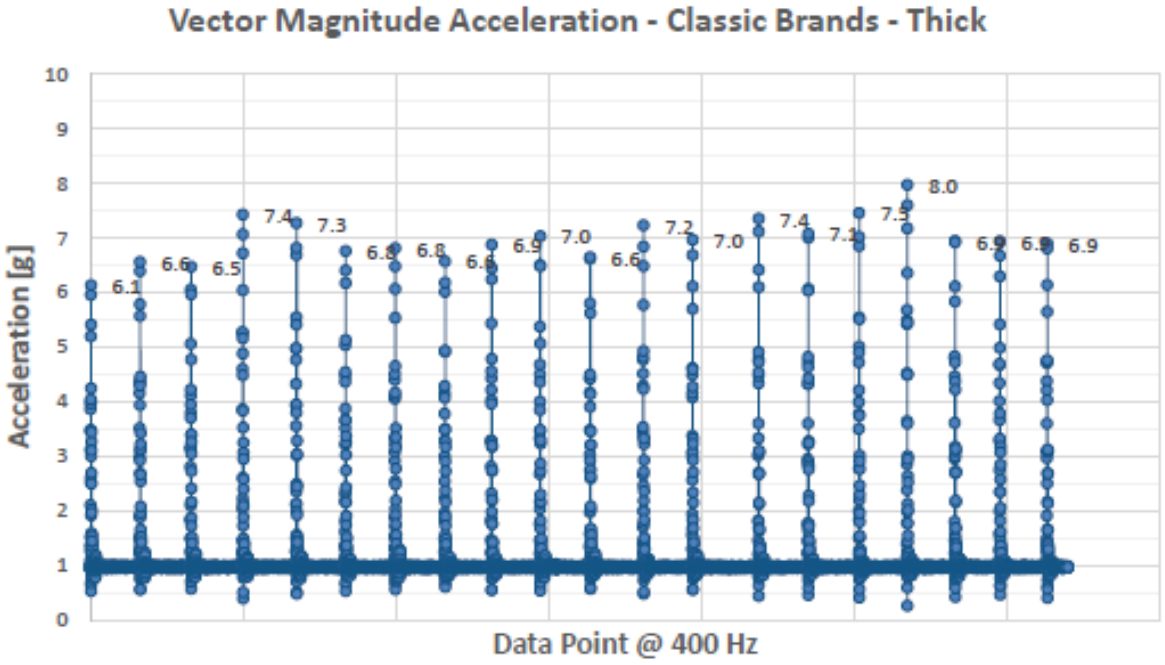


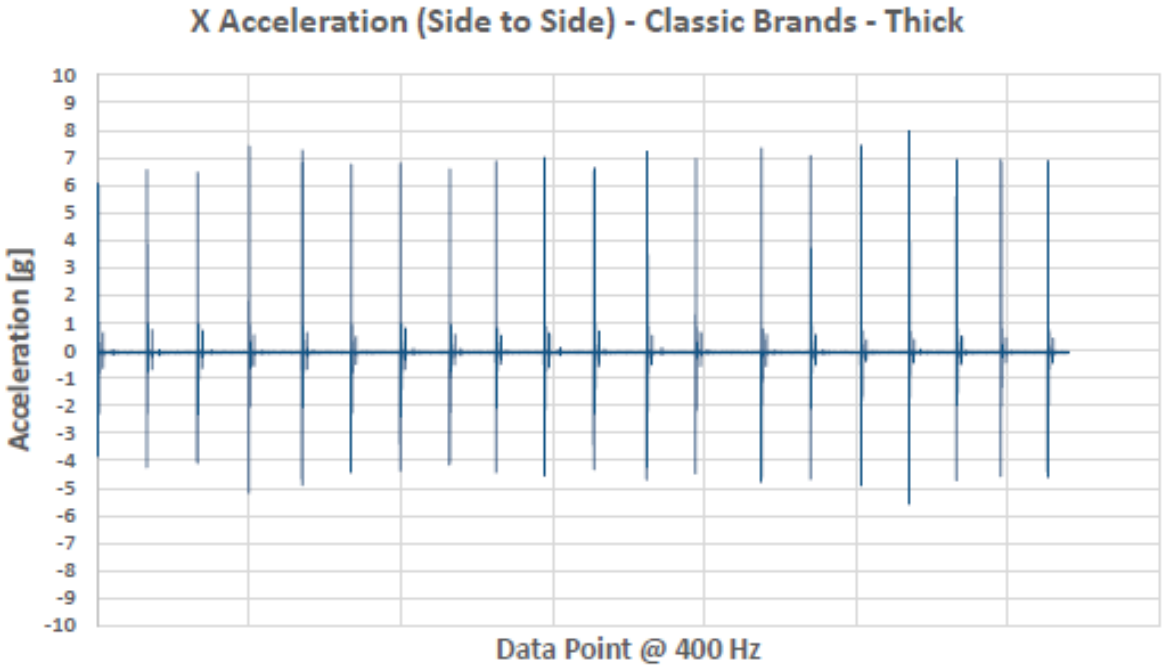


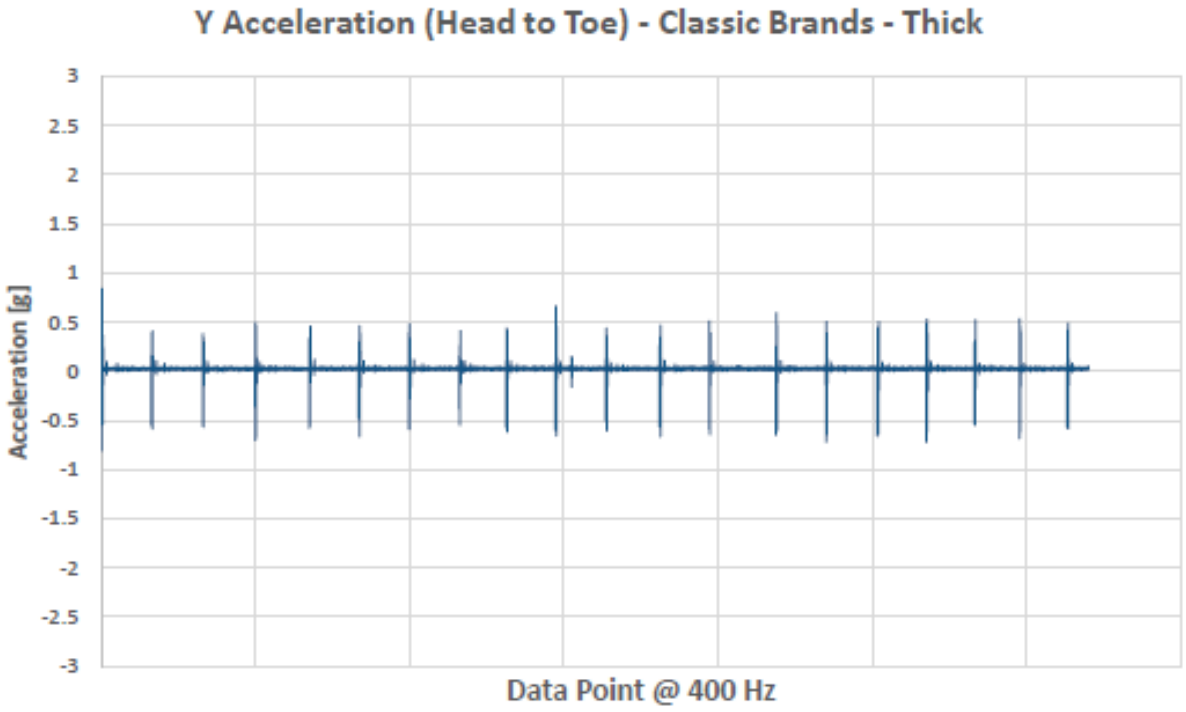

Y Acceleration (Head to Toe) - Classic Brands - Thin
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

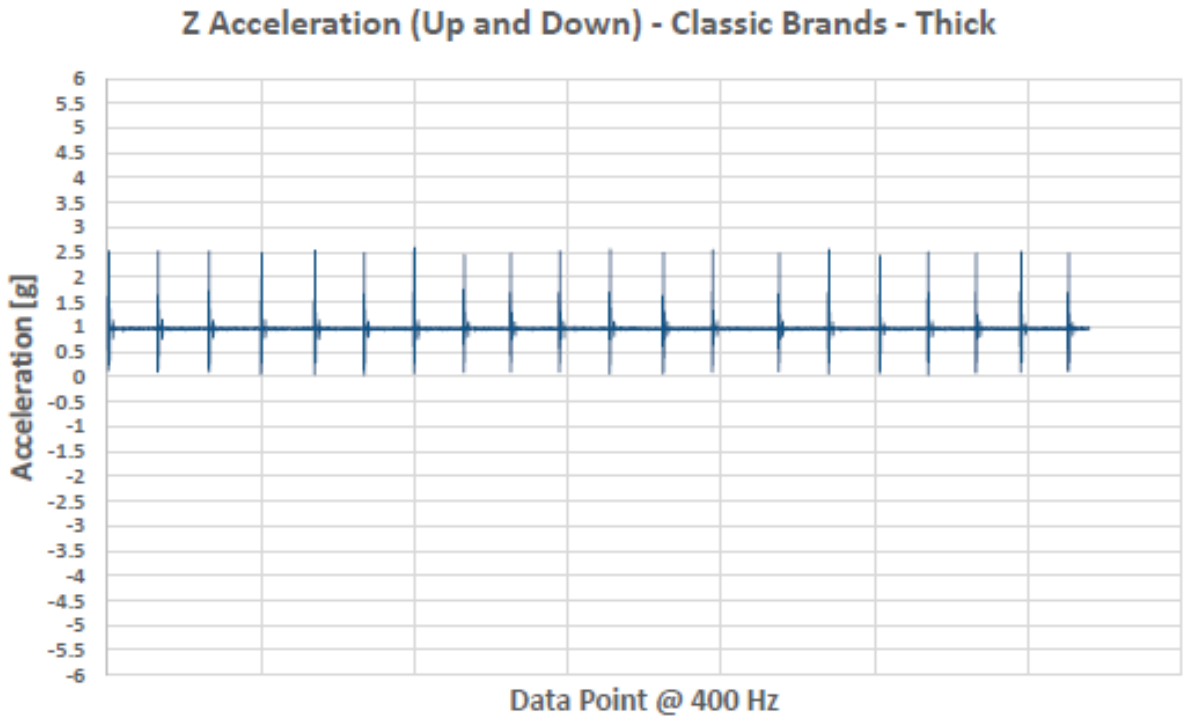

Z Acceleration (Up and Down) - Classic Brands - Thin
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – CLASSIC BRANDS – THICK

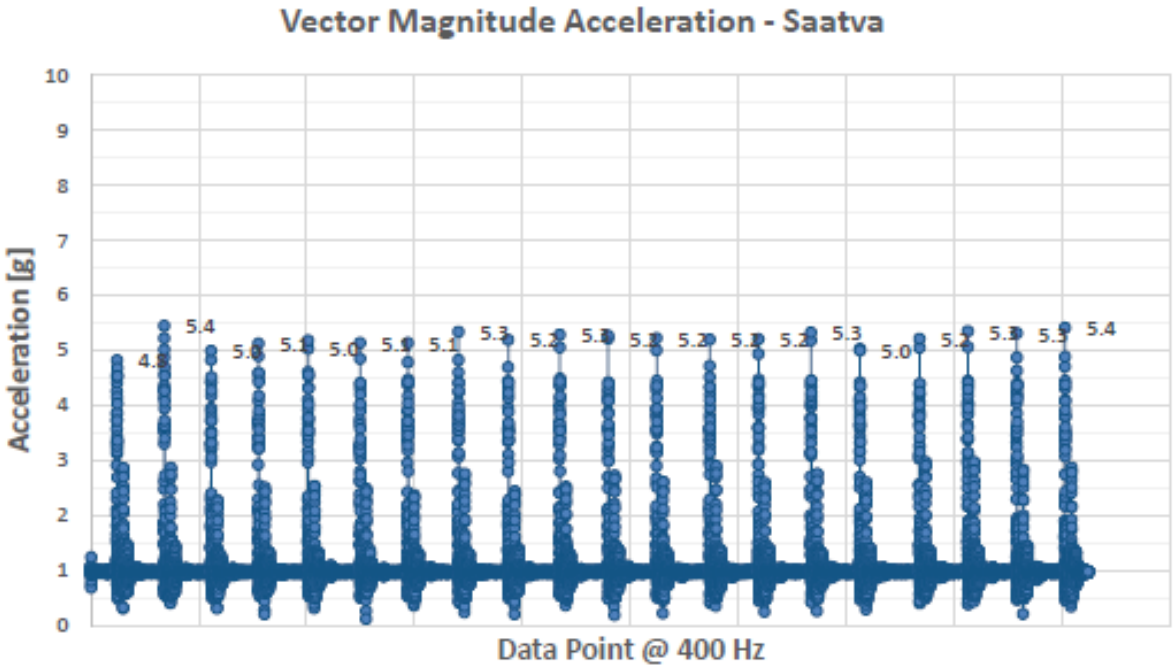


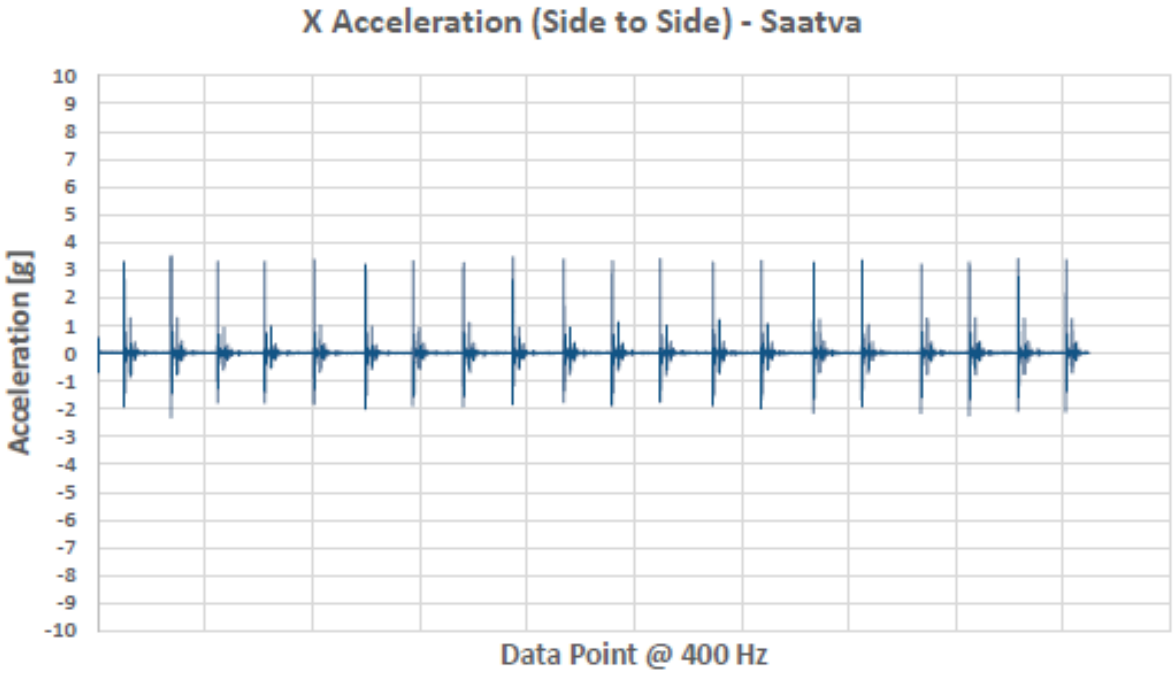


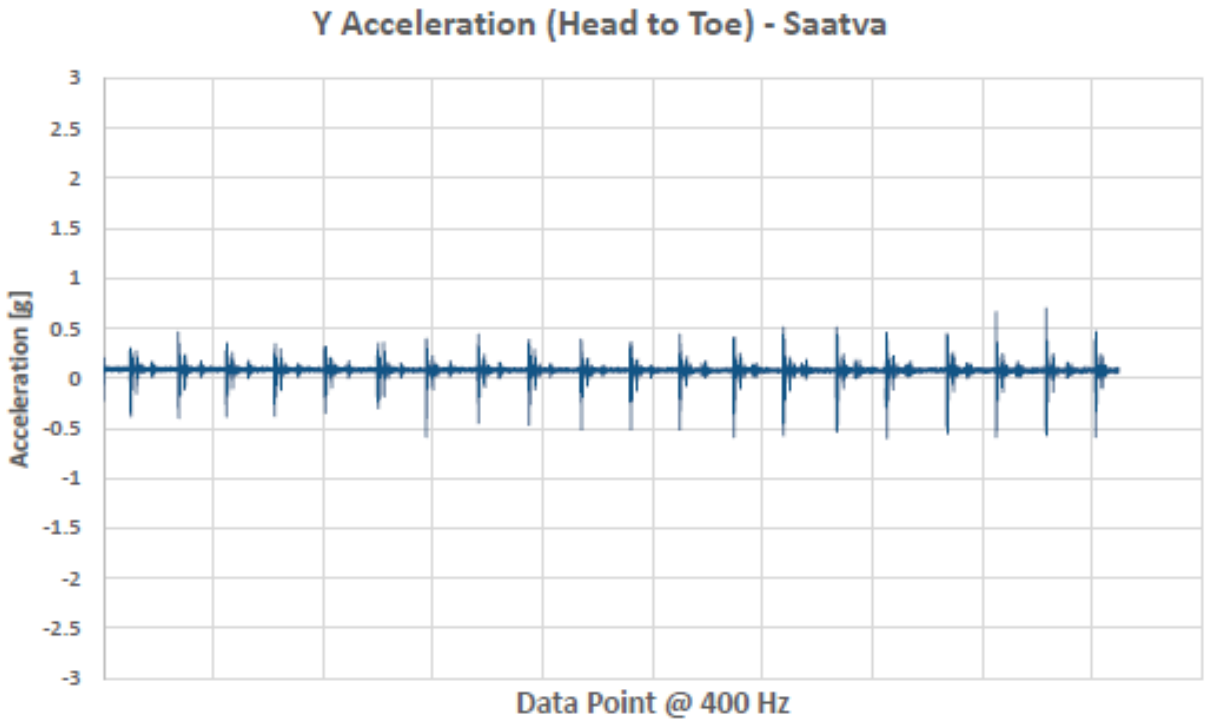

Y Acceleration (Head to Toe) - Classic Brands - Thick
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

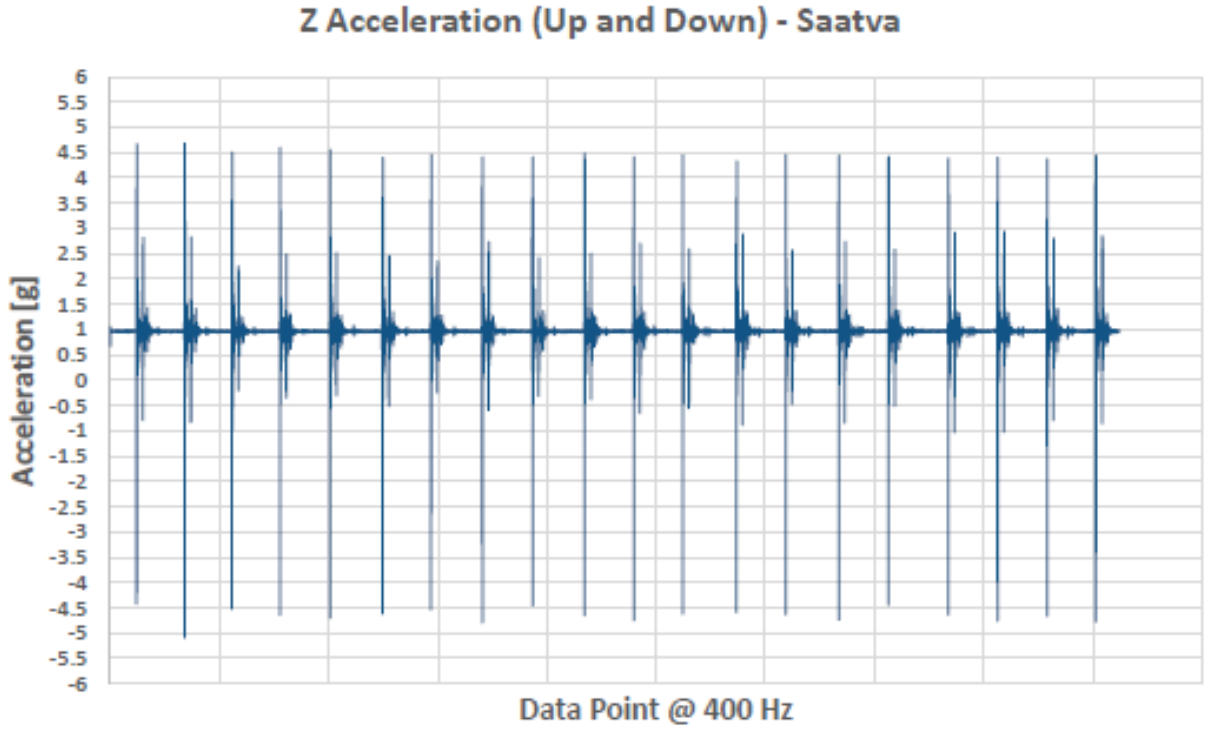

Z Acceleration (Up and Down) - Classic Brands - Thick
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – SAATVA

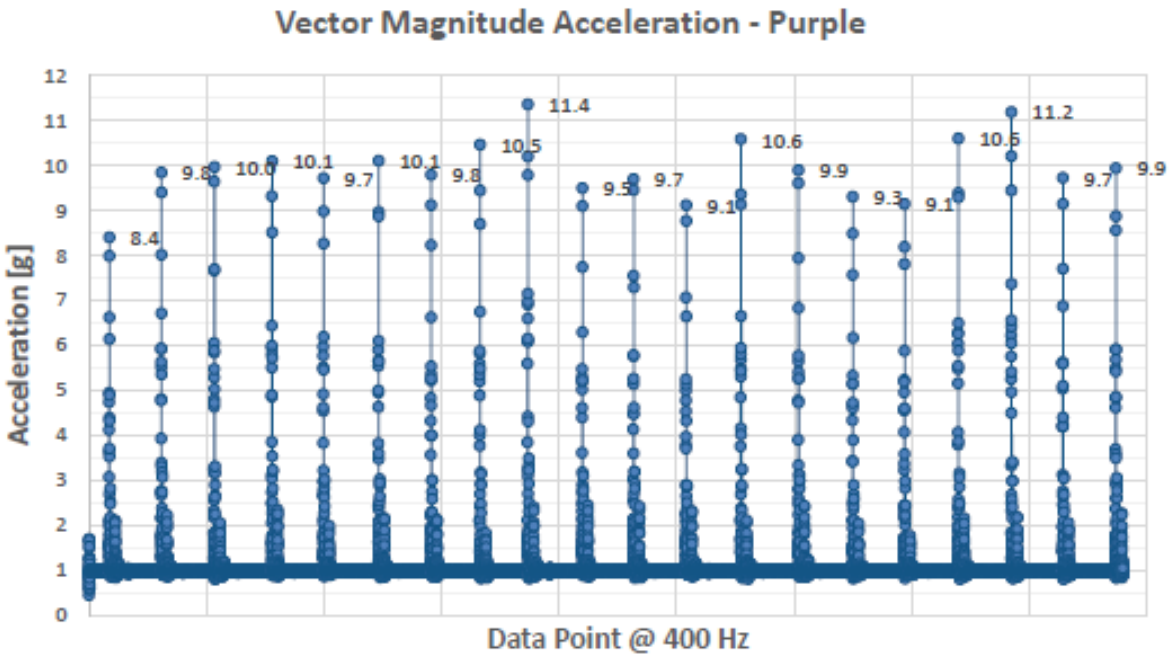


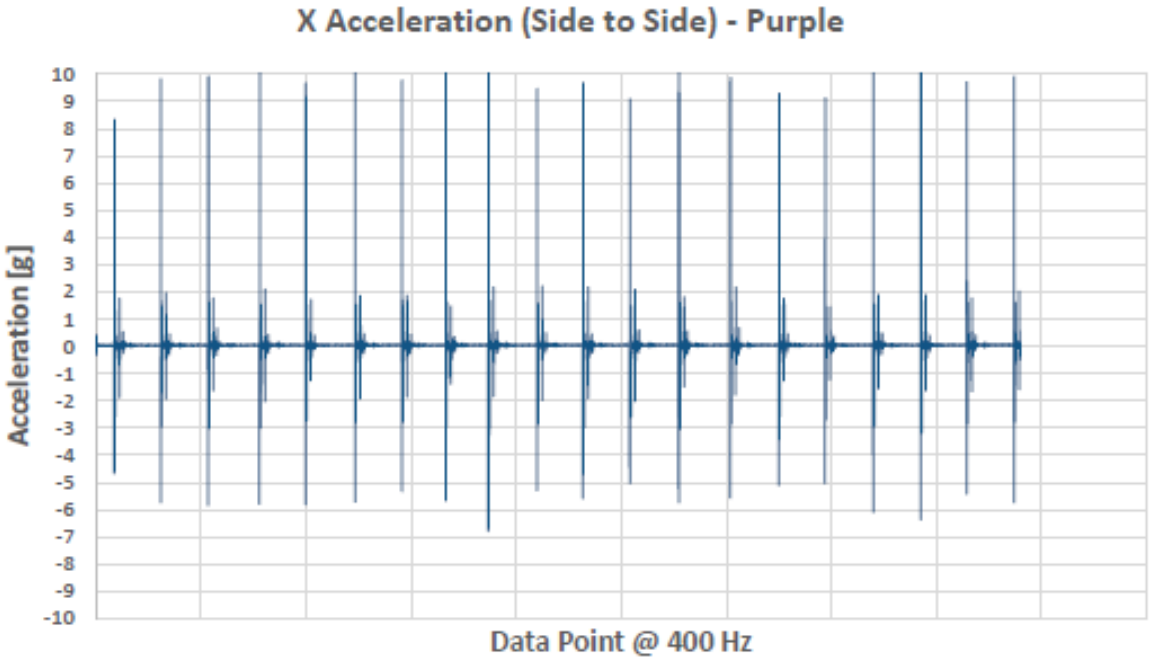


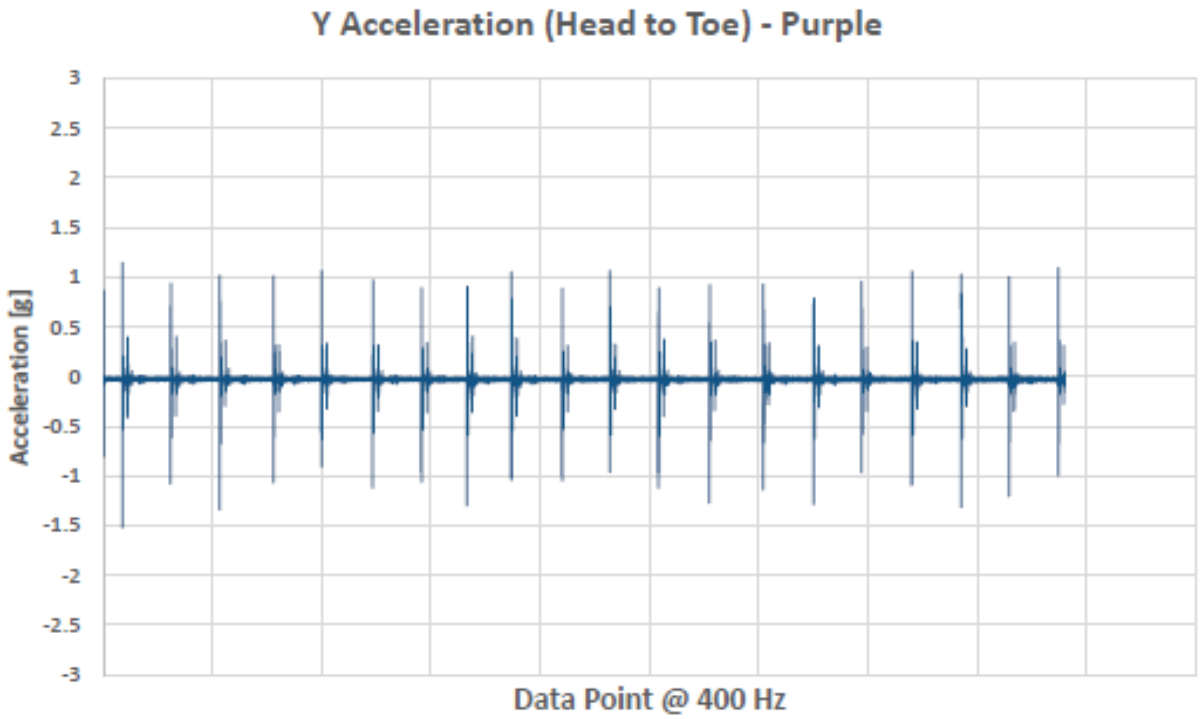

Y Acceleration (Head to Toe) - Saatva
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

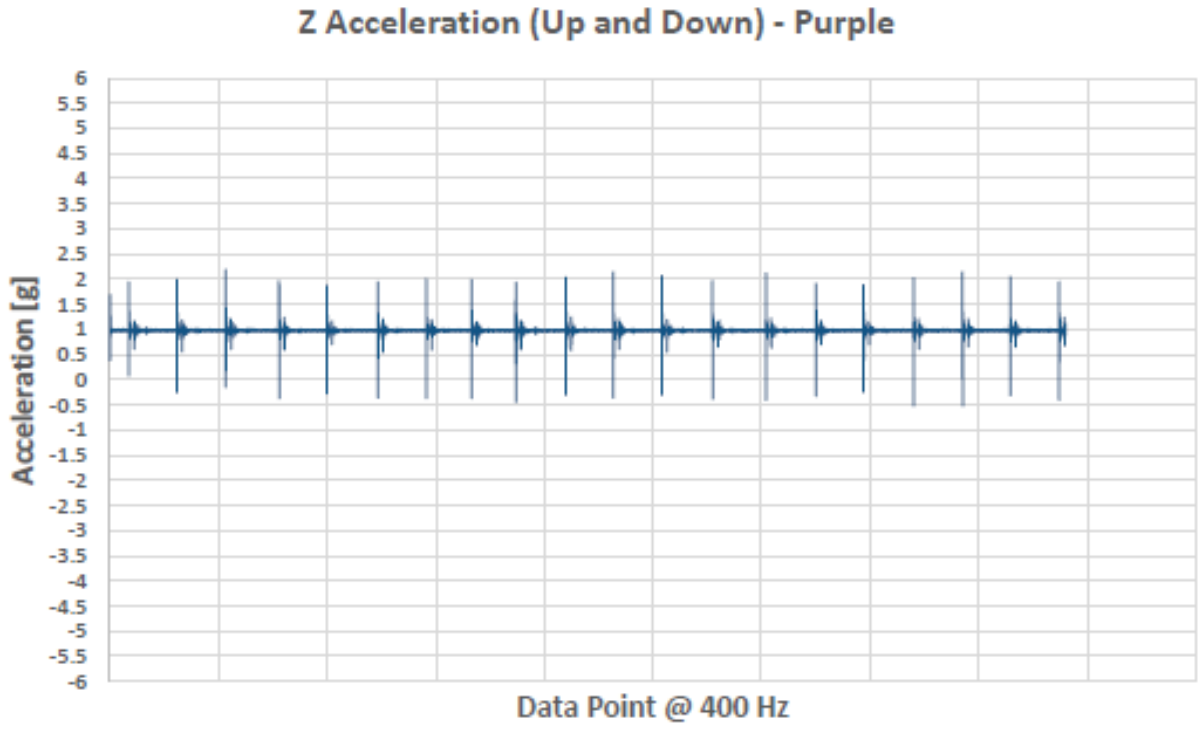

Z Acceleration (Up and Down) - Saatva
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – PURPLE

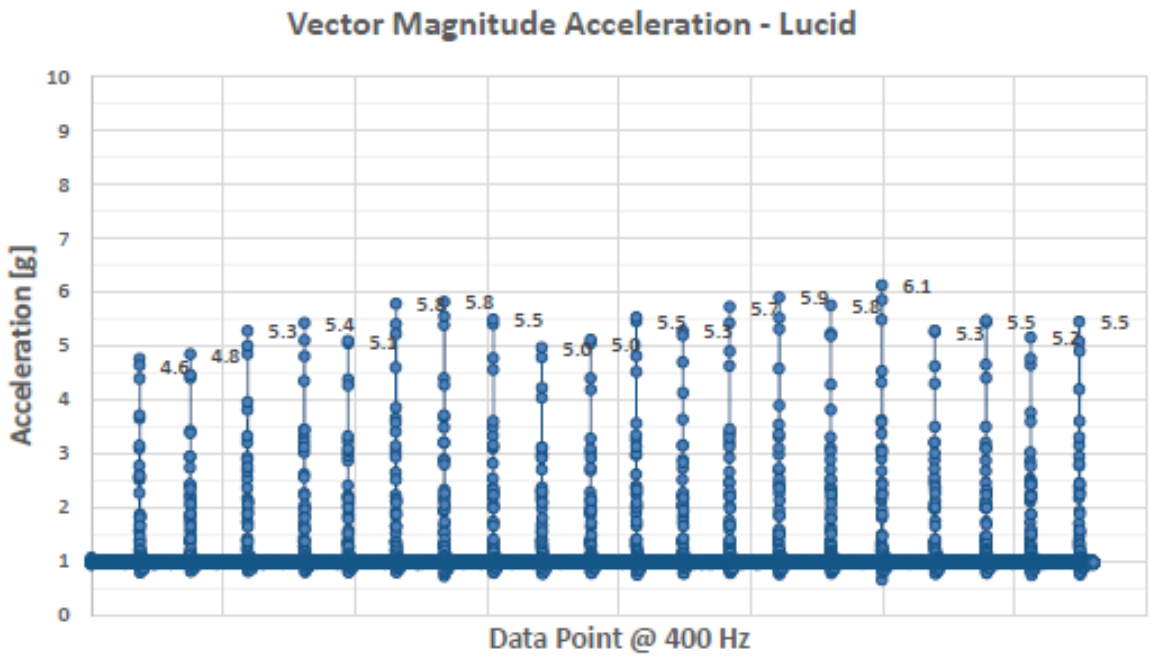


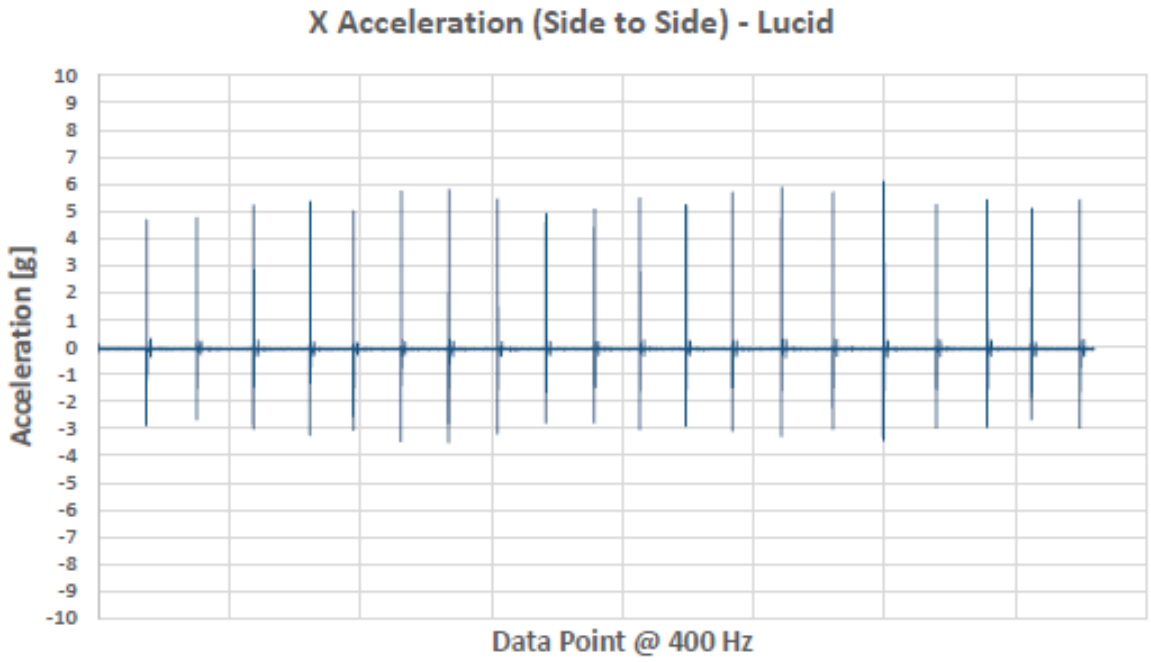


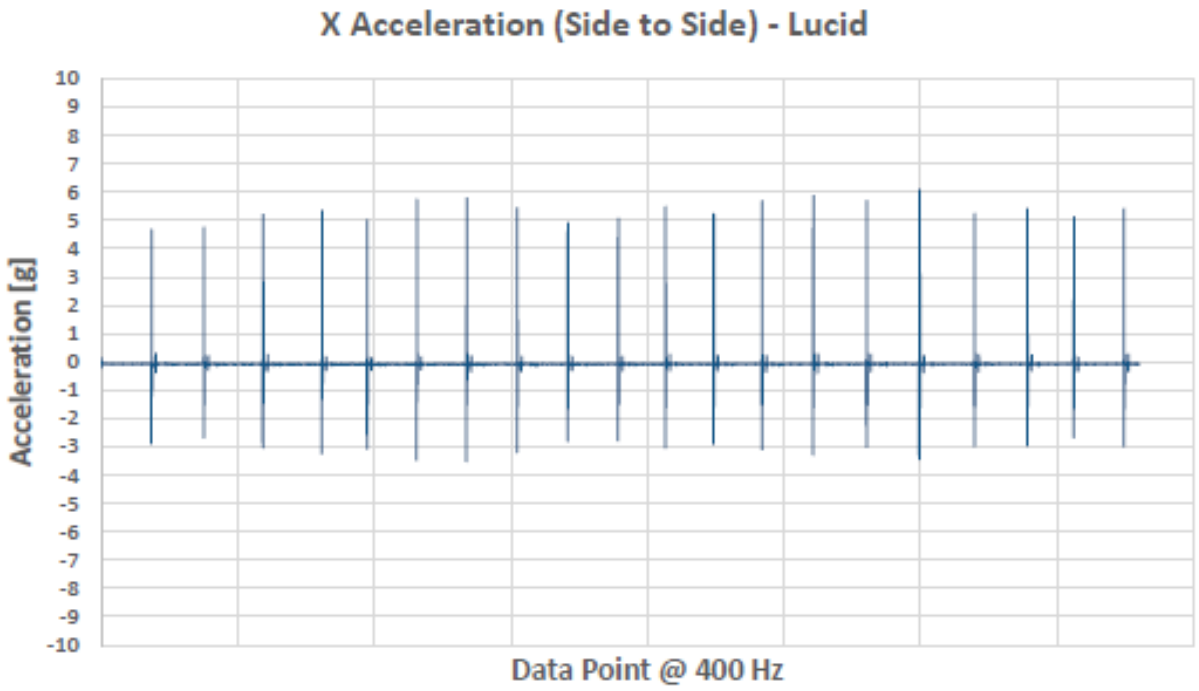

Y Acceleration (Head to Toe) - Purple
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

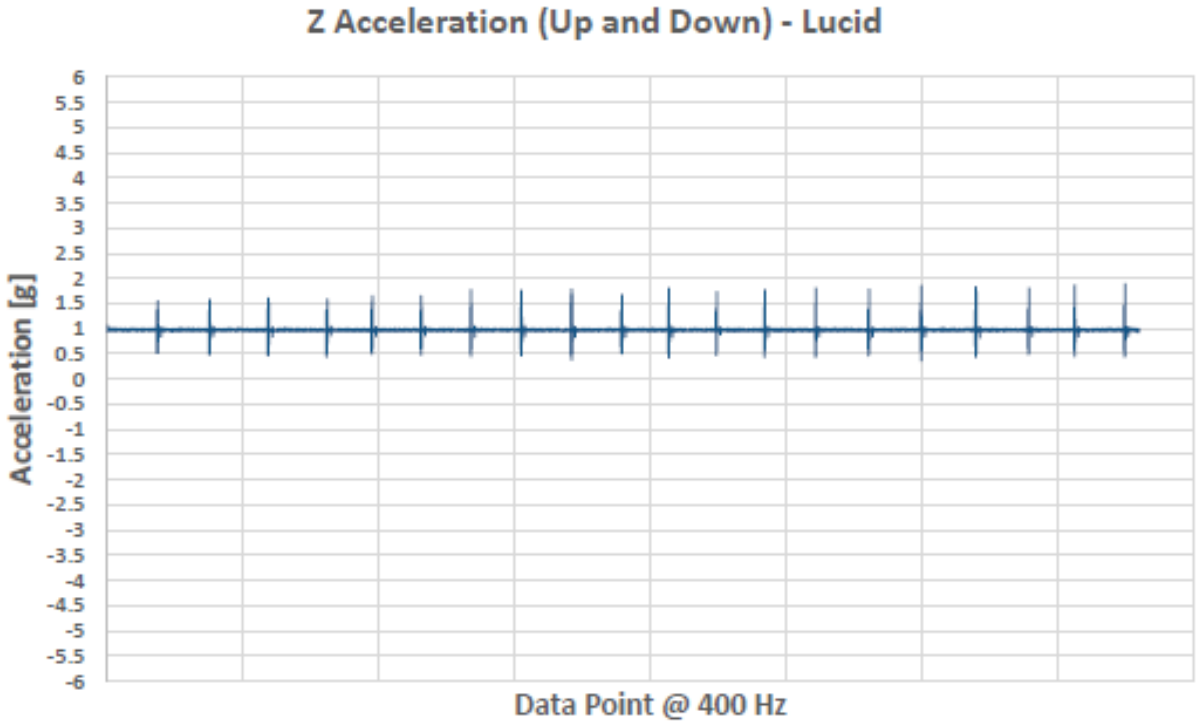

Z Acceleration (Up and Down) - Purple
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – LUCID

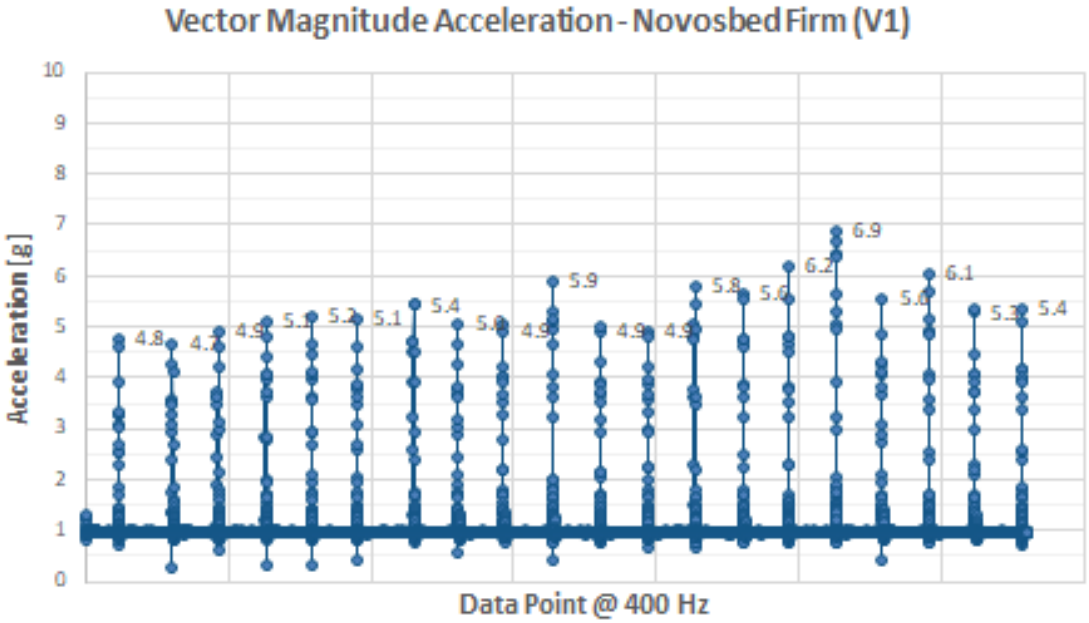

Vector Magnitude Acceleration - Lucid
Acceleration [g]
Data Point @ 400 Hz
4.6
4.8
5.3
5.4
5.1
5.8
5.8
5.5
5.0
5.0
5.5
5.3
5.7
5.9
5.8
6.1
5.3
5.5
5.2
5.5

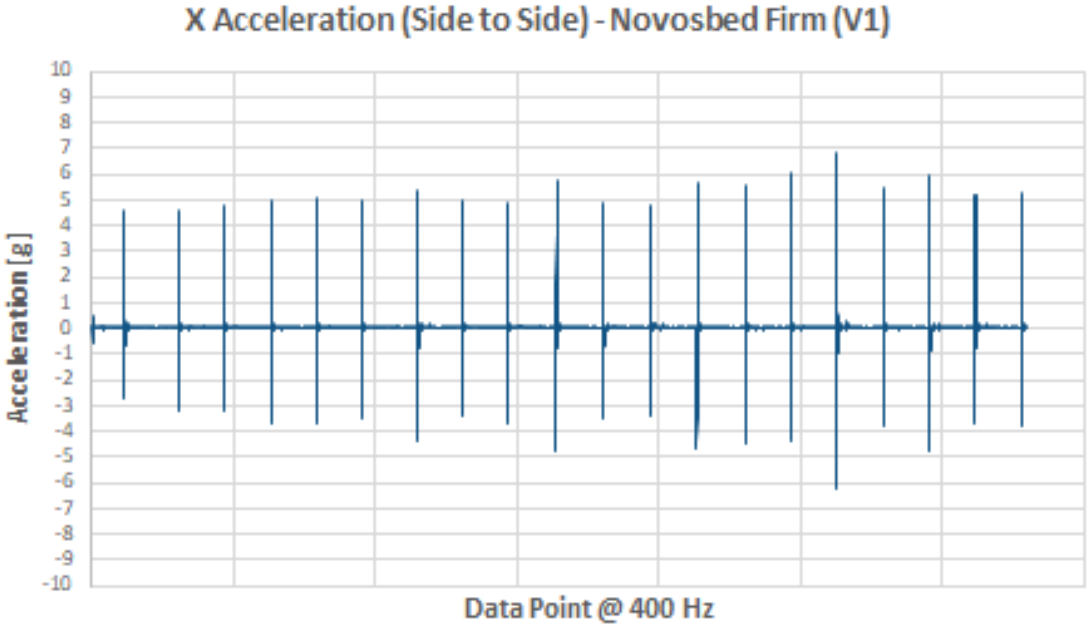

X Acceleration (Side to Side) - Lucid
Acceleration [g]
Data Point @ 400 Hz

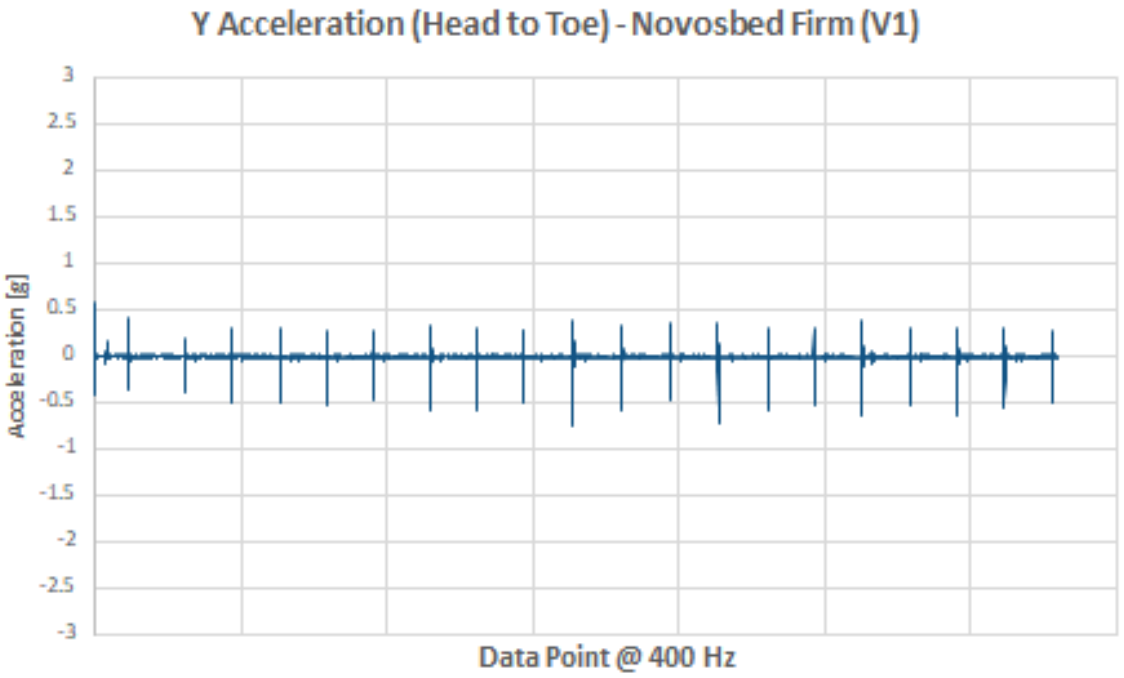

X Acceleration (Side to Side) - Lucid
Acceleration [g]
10
9
8
7
6
5
4
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
Data Point @ 400 Hz

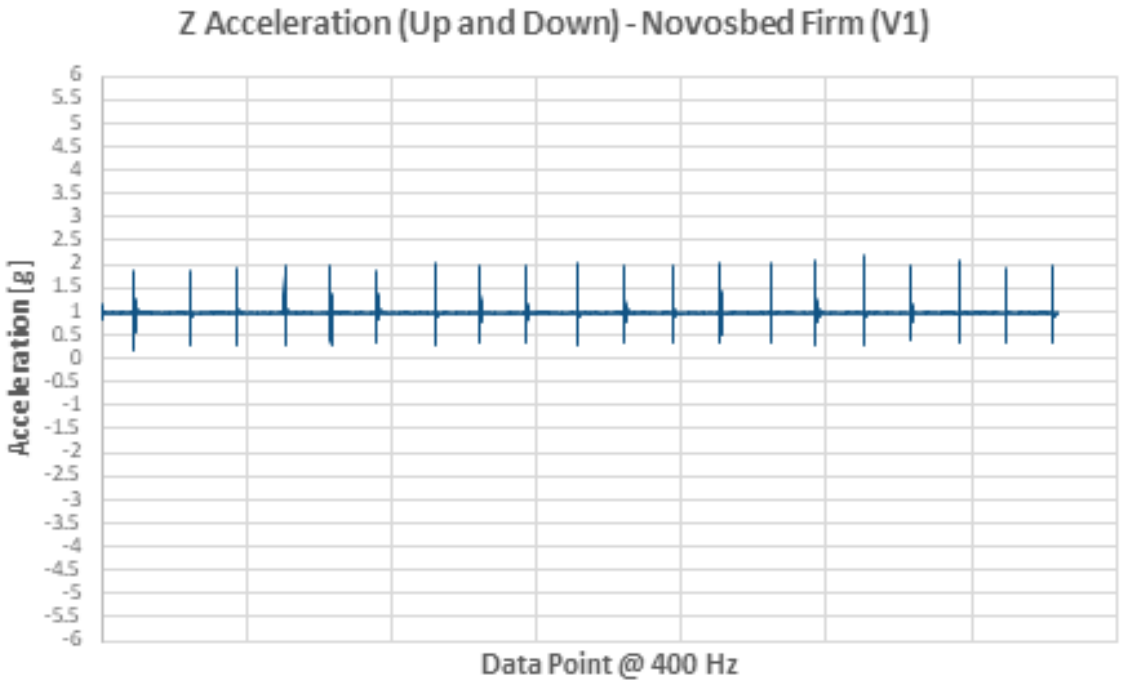

Z Acceleration (Up and Down) - Lucid
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – NOVOSBED FIRM (V1)

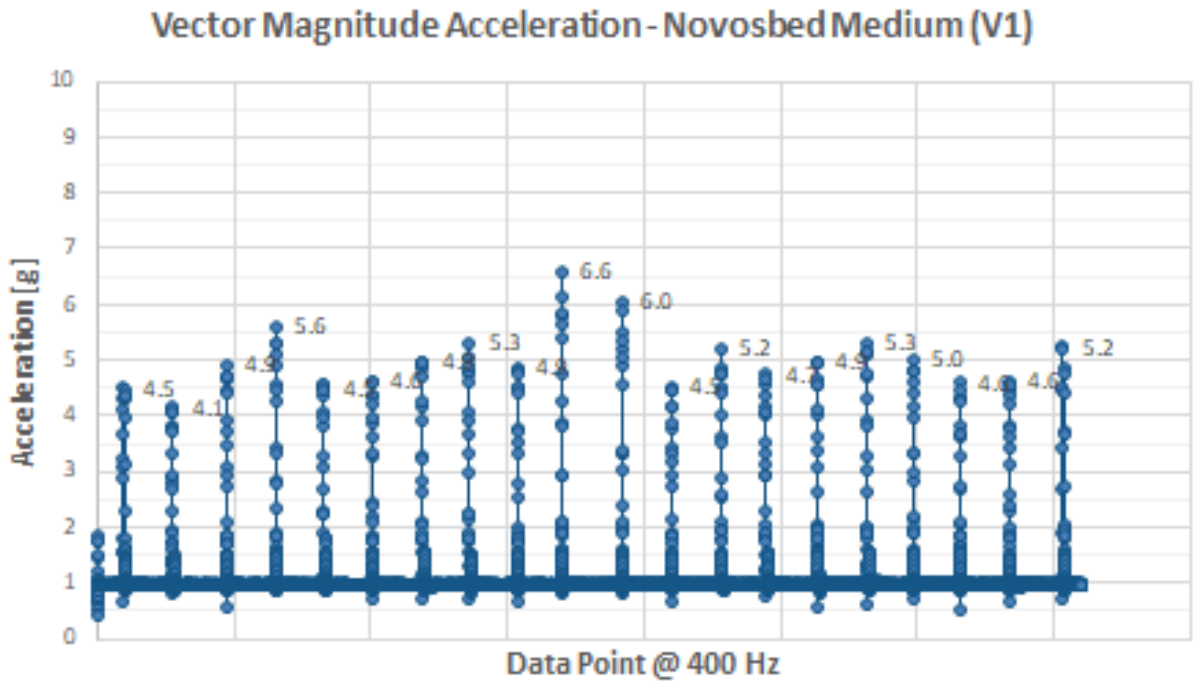


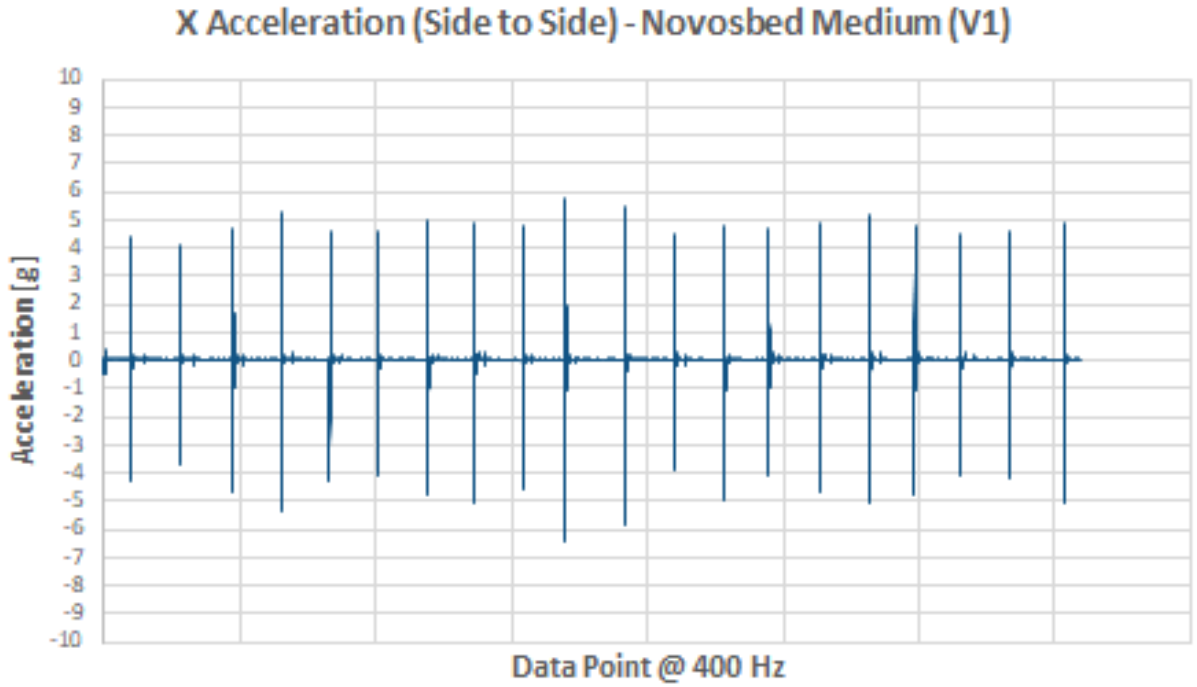


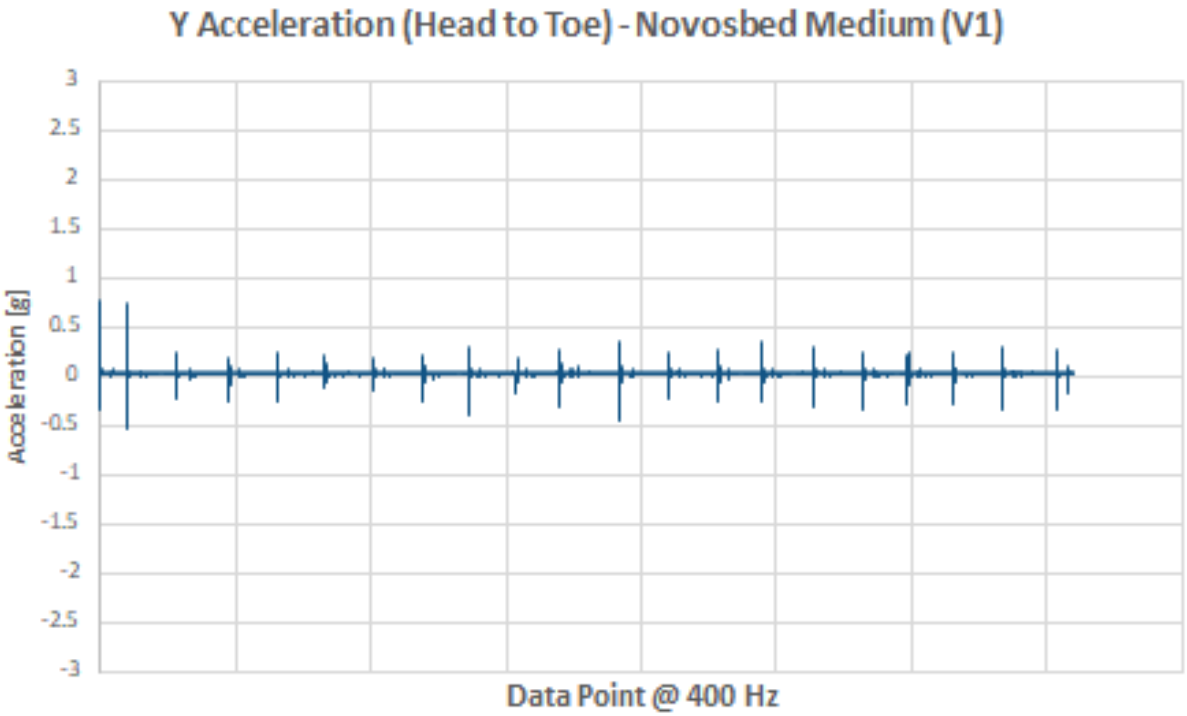

Y Acceleration (Head to Toe) - Novosbed Firm (V1)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

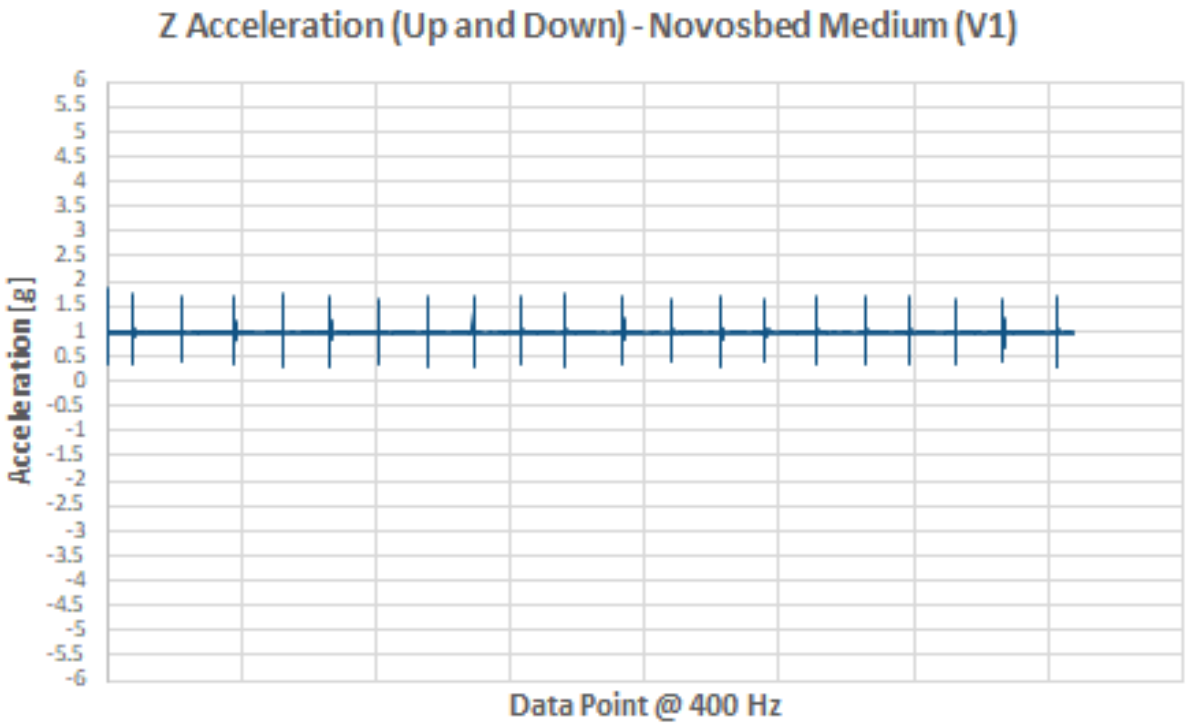

Z Acceleration (Up and Down) - Novosbed Firm (V1)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – NOVOSBED MEDIUM (V1)

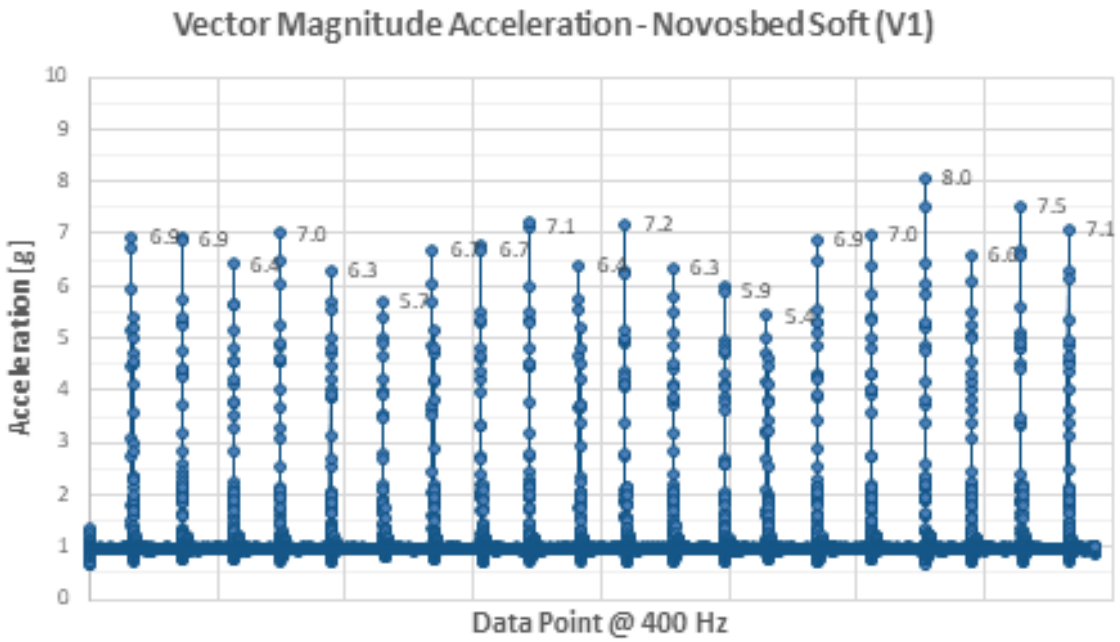


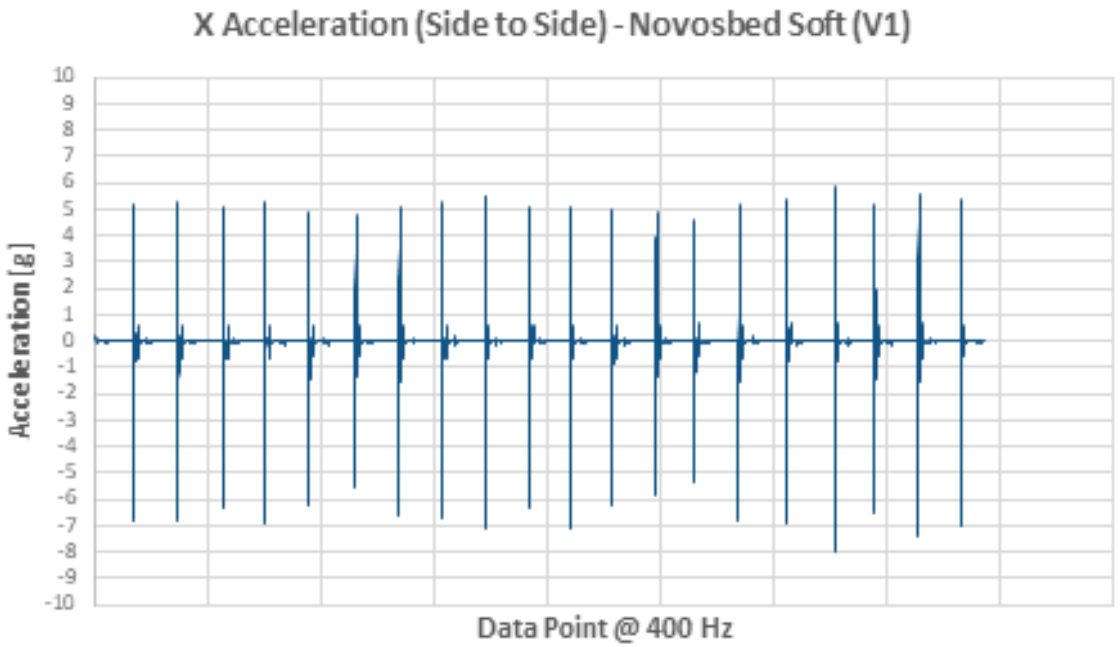


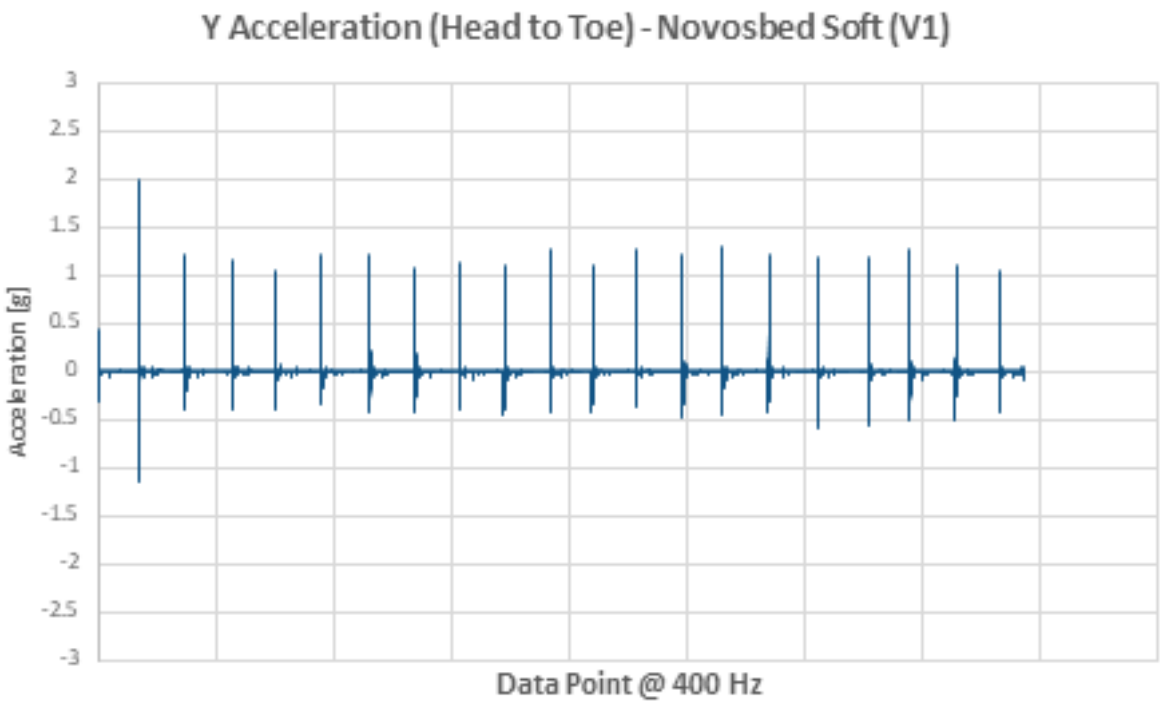

Y Acceleration (Head to Toe) - Novosbed Medium (V1)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

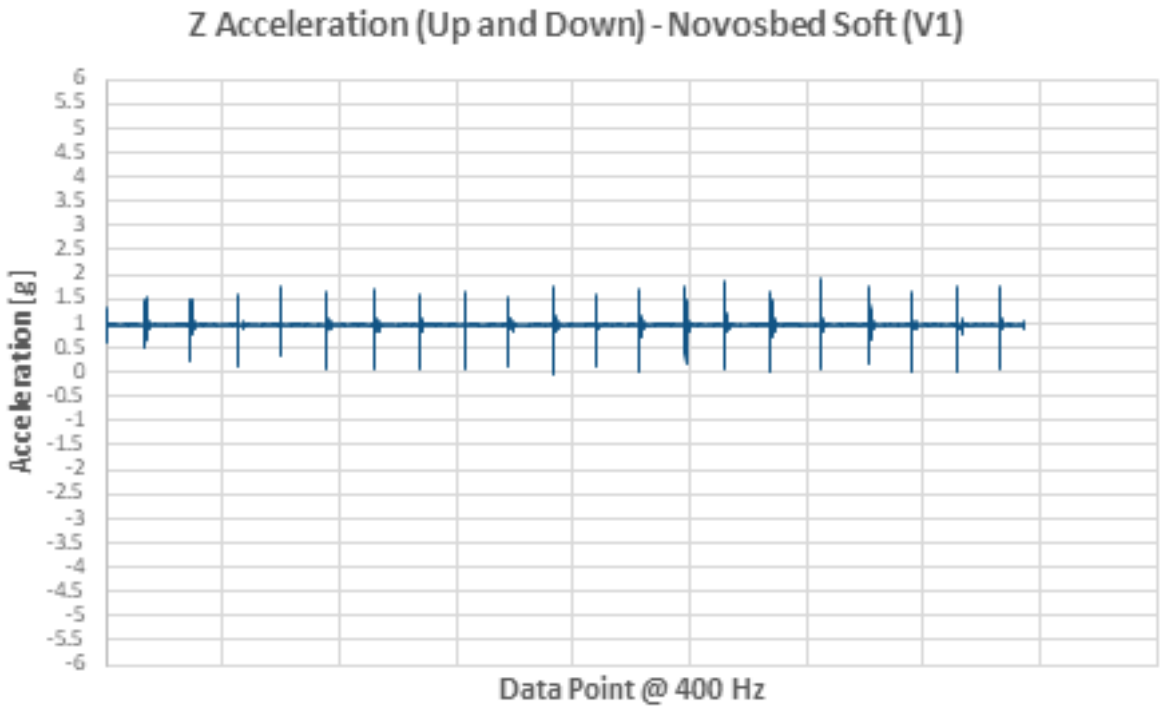

Z Acceleration (Up and Down) - Novosbed Medium (V1)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – NOVOSBED SOFT (V1)

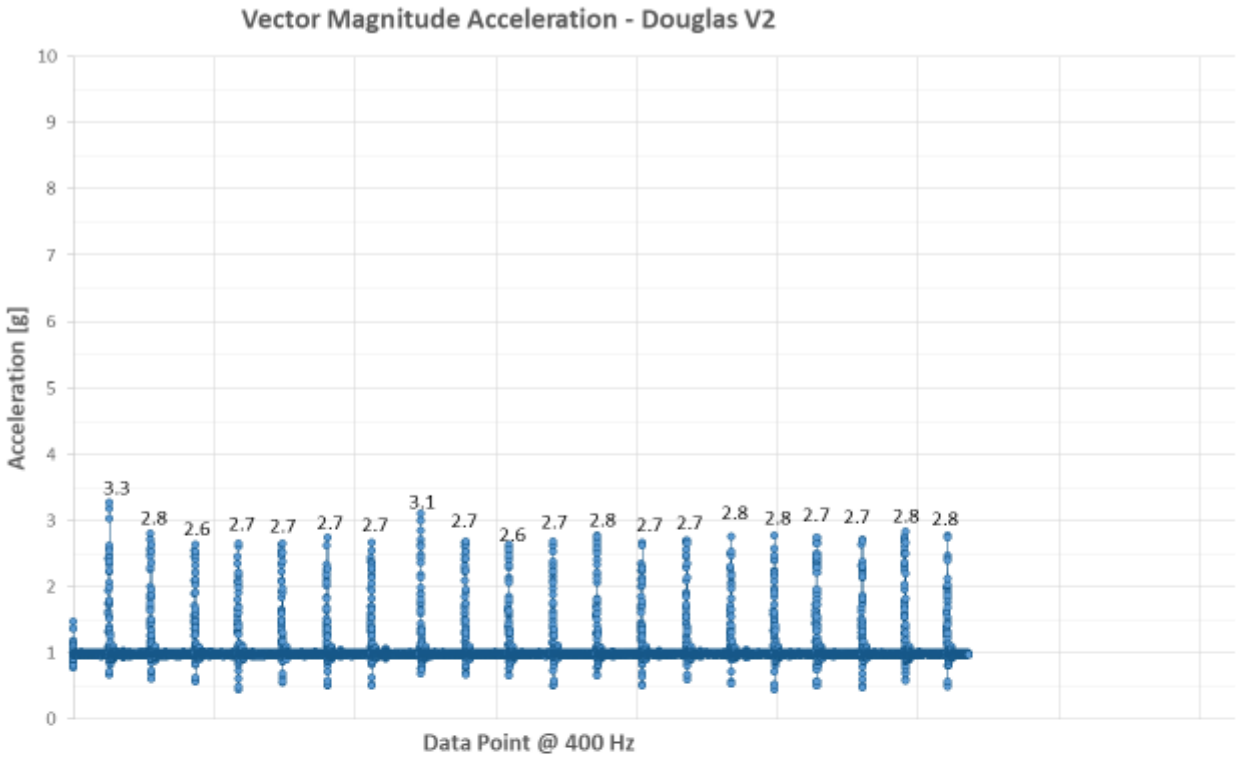


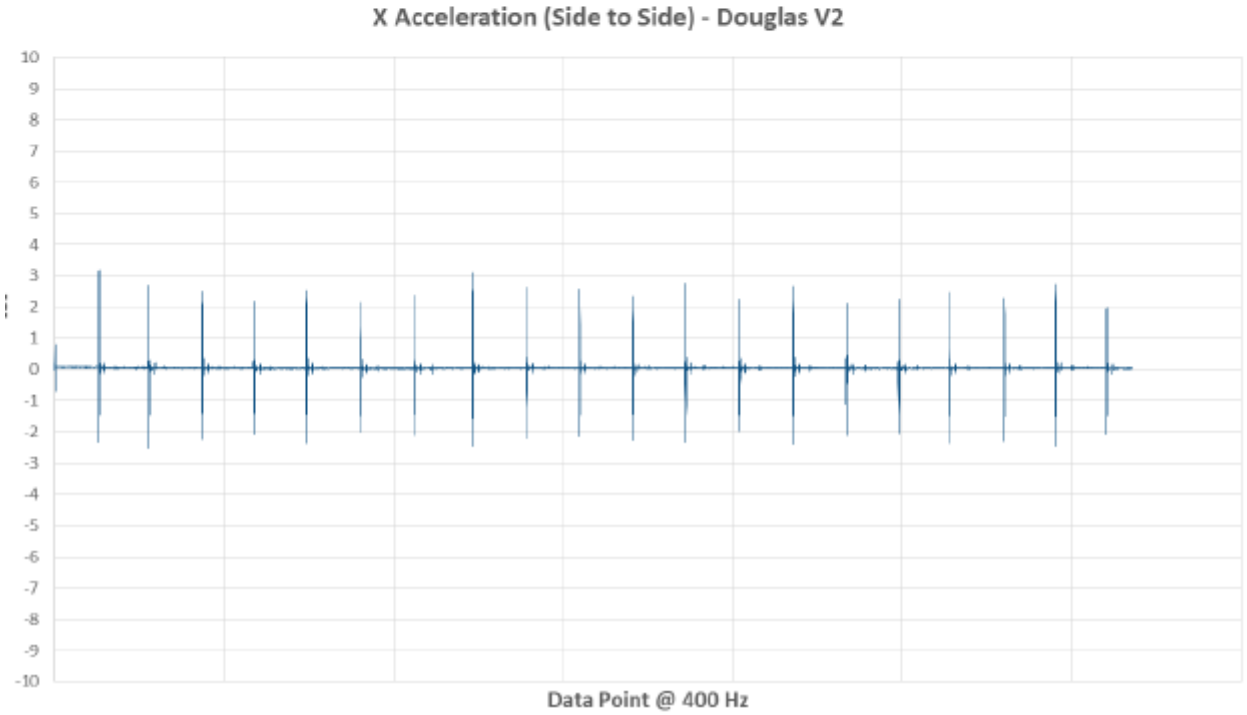


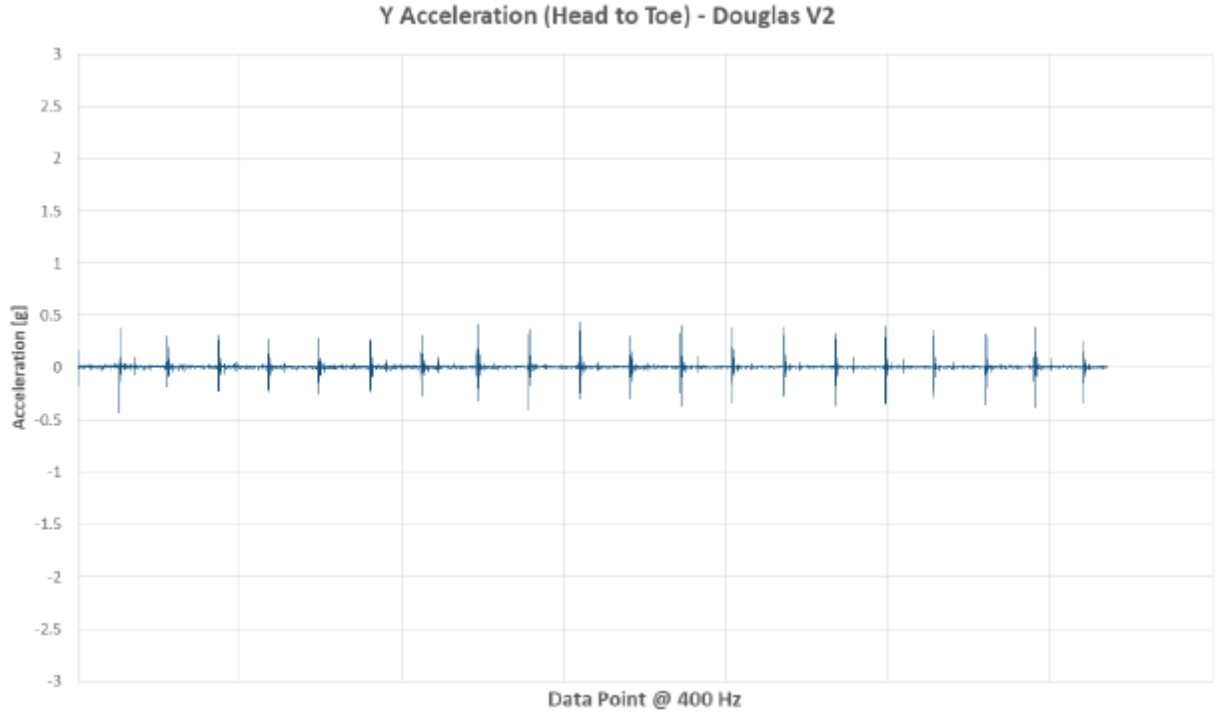

Y Acceleration (Head to Toe) - Novosbed Soft (V1)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

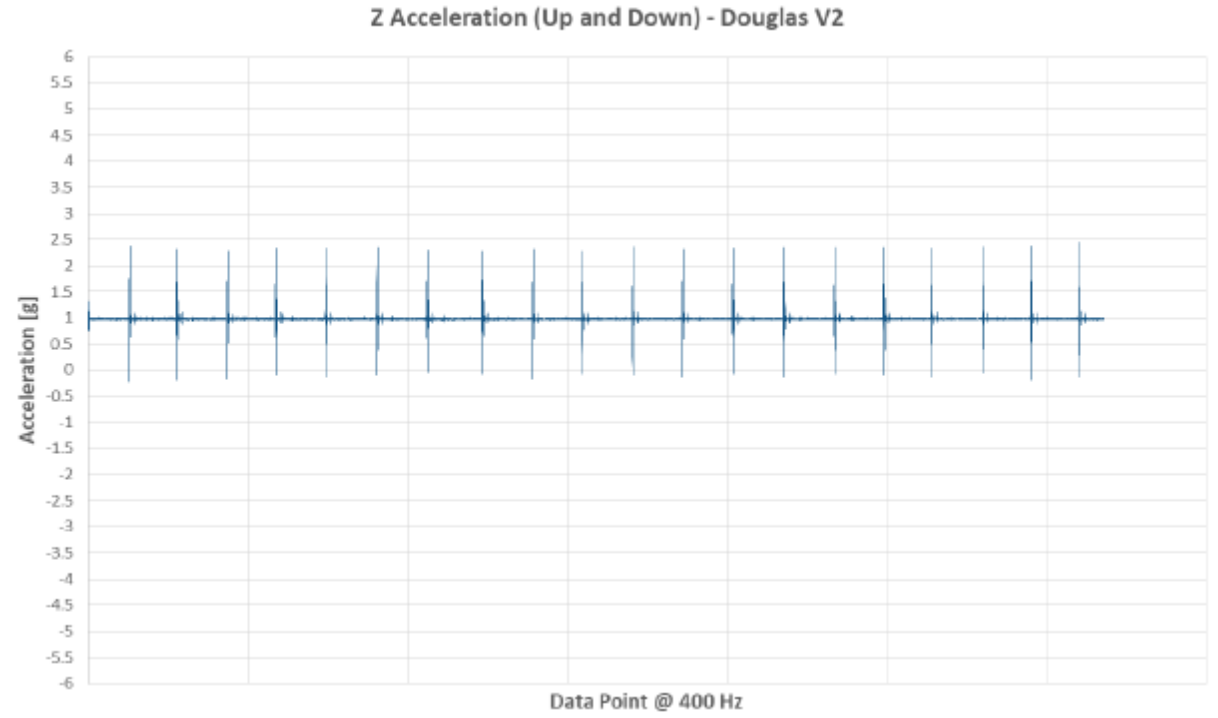

Z Acceleration (Up and Down) - Novosbed Soft (V1)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – DOUGLAS (V2)

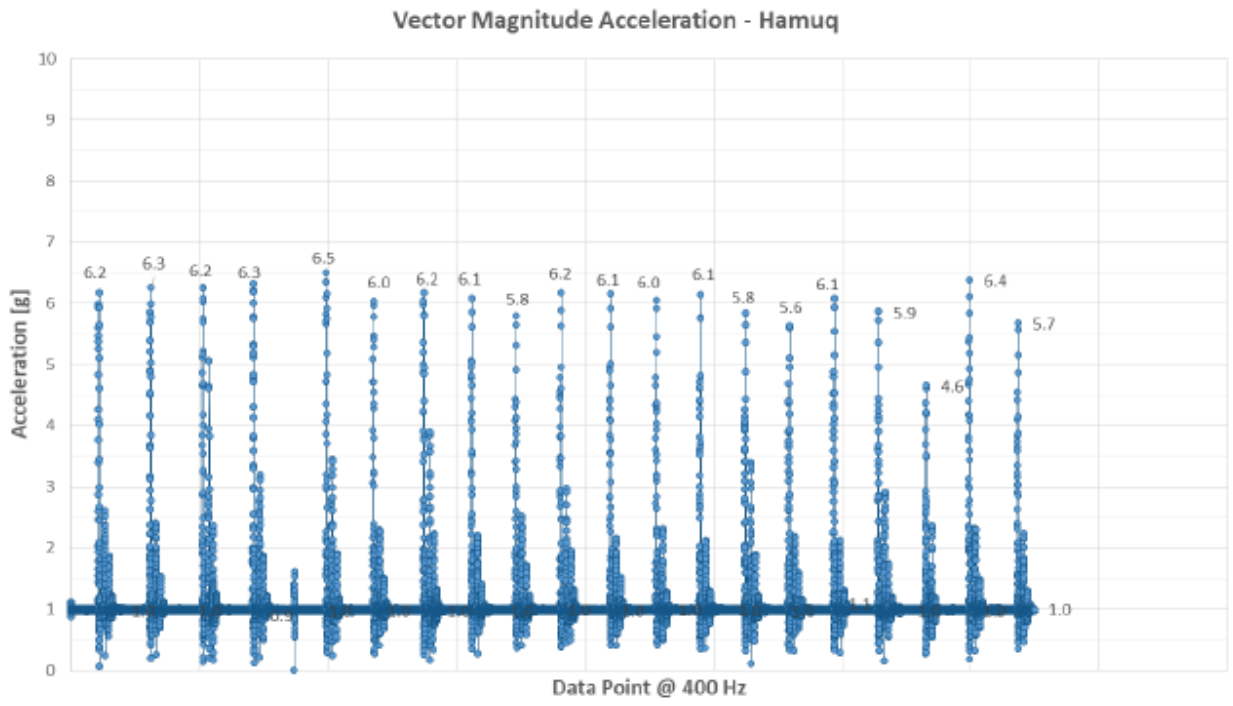


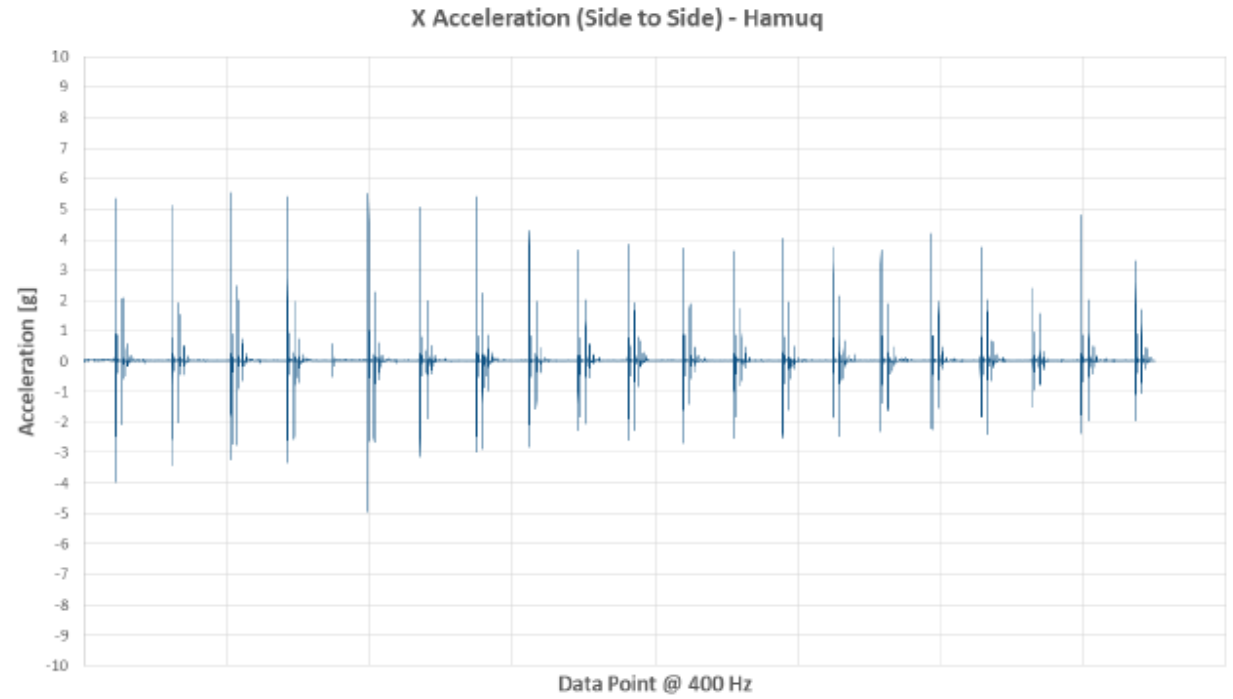


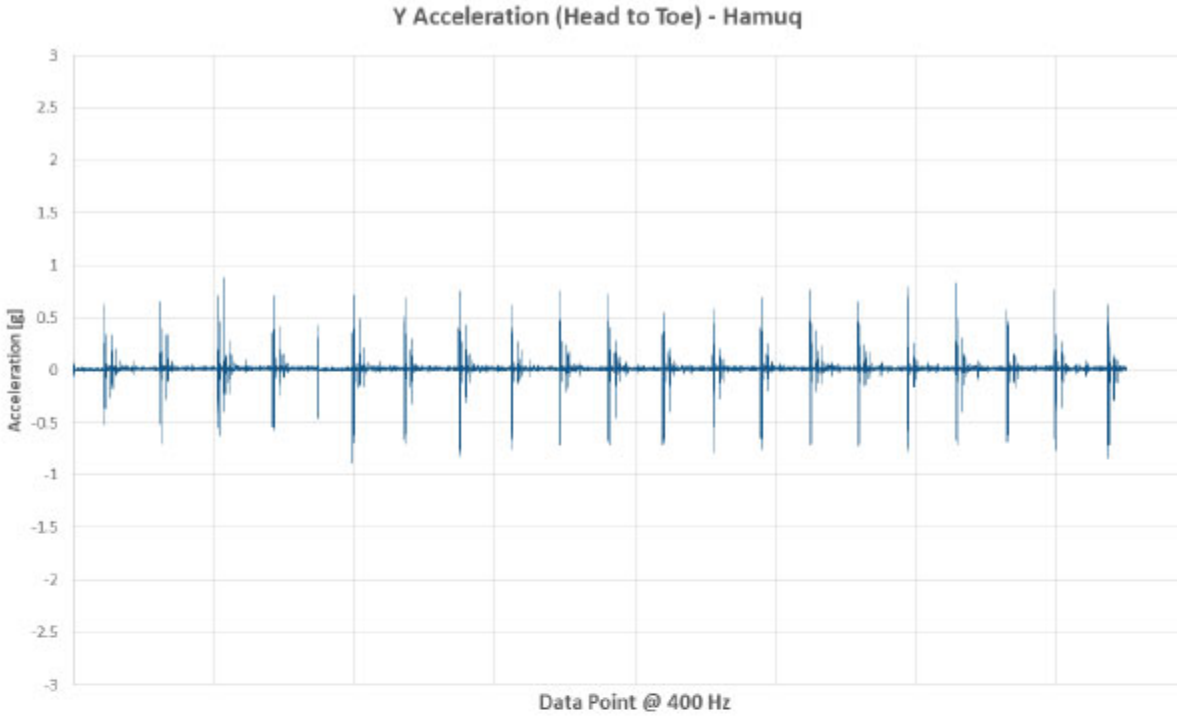

Y Acceleration (Head to Toe) - Douglas V2
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

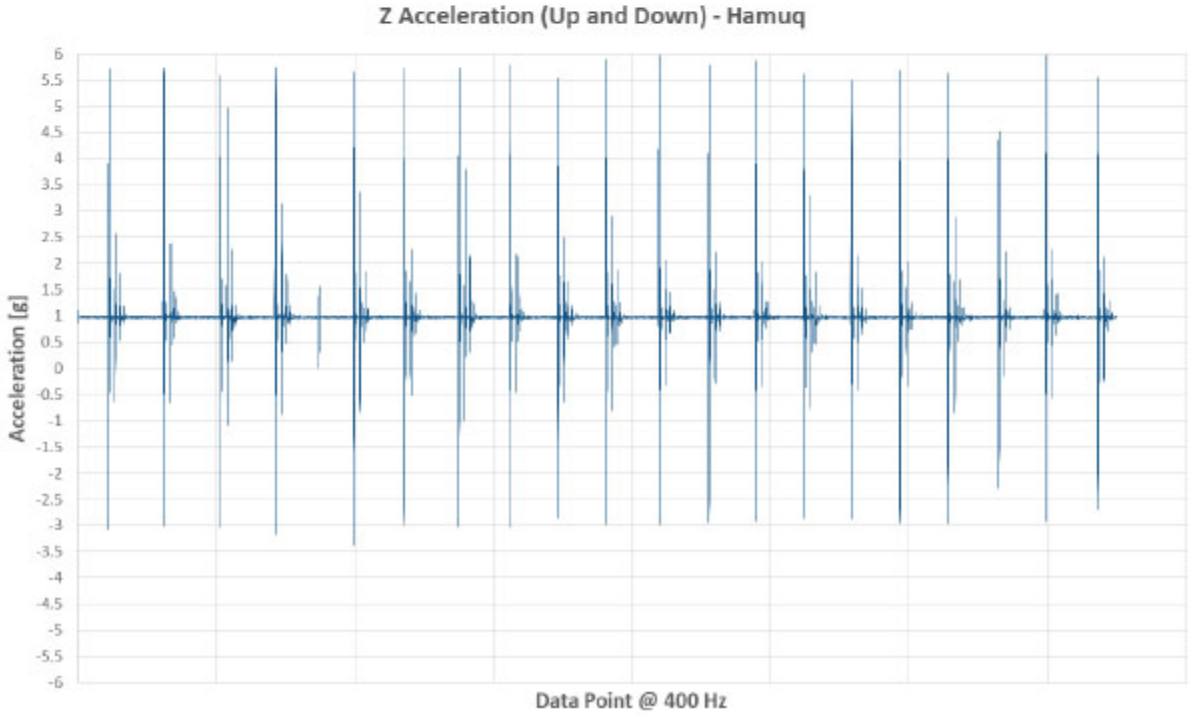

Z Acceleration (Up and Down) - Douglas V2
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – HAMUQ

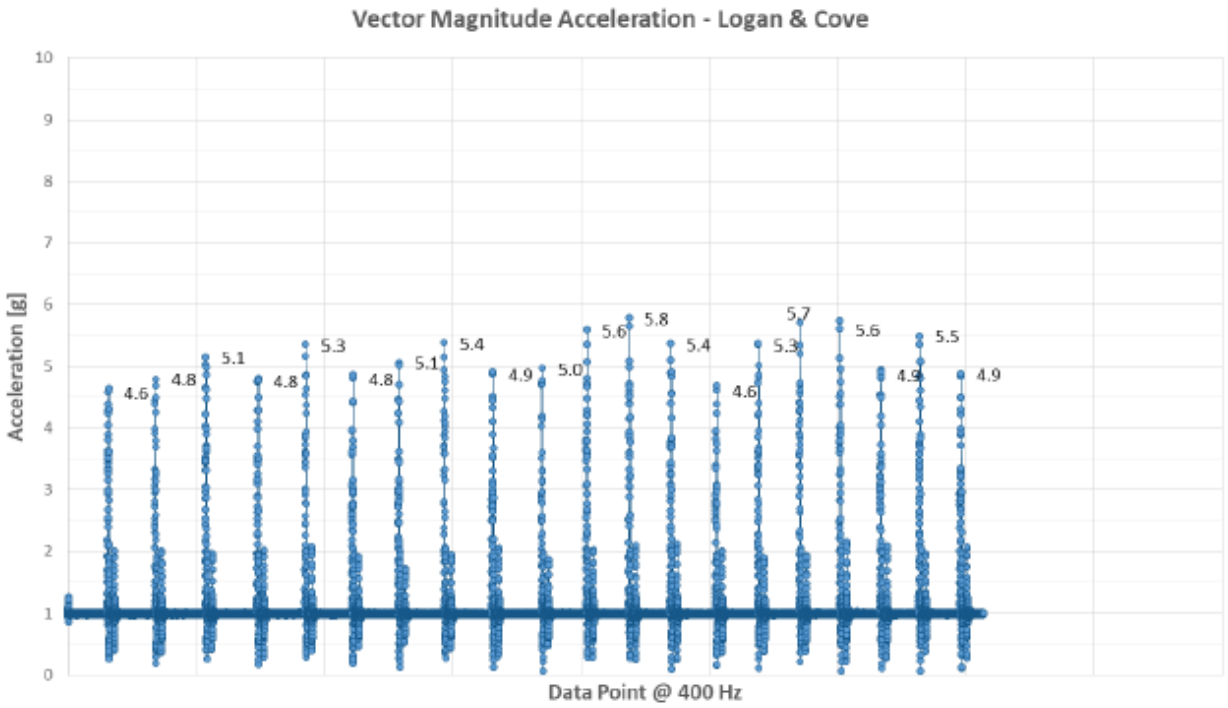

Vector Magnitude Acceleration - Hamuq
Acceleration [g]
Data Point @ 400 Hz
6.2
6.3
6.2
6.3
6.5
6.0
6.2
6.1
5.8
6.2
6.1
6.0
6.1
5.8
5.6
6.1
5.9
4.6
6.4
5.7
1.0

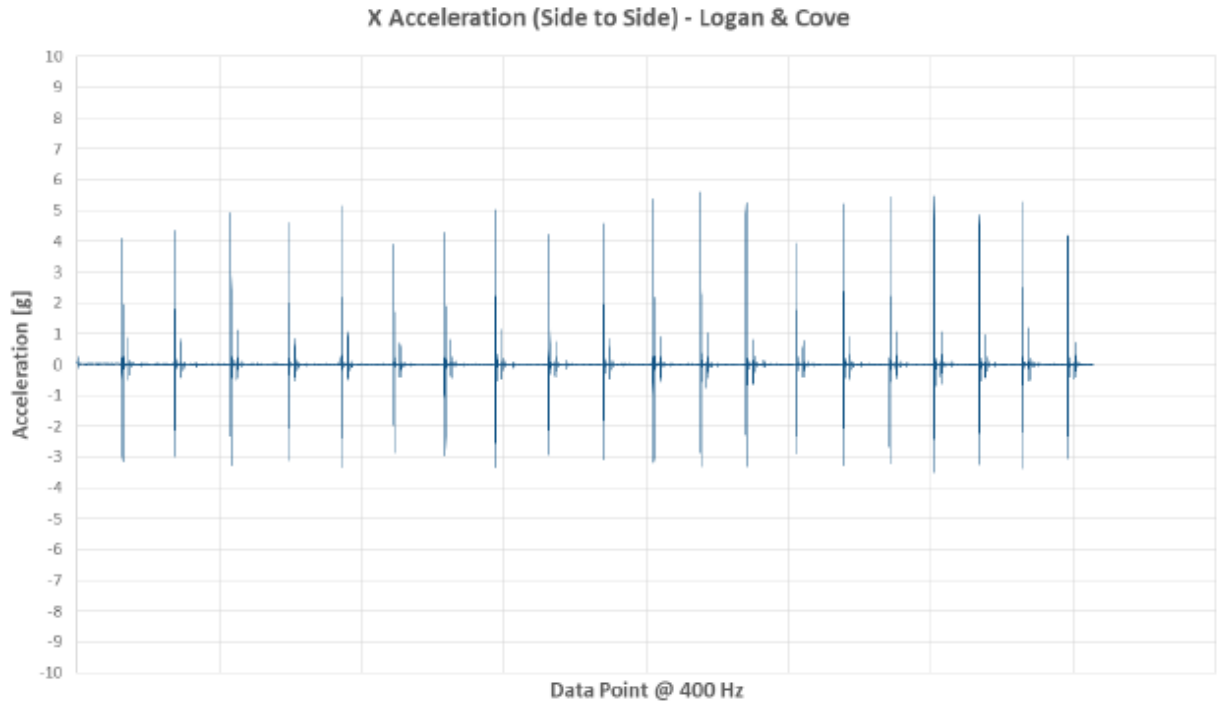

X Acceleration (Side to Side) - Hamuq
Acceleration [g]
Data Point @ 400 Hz

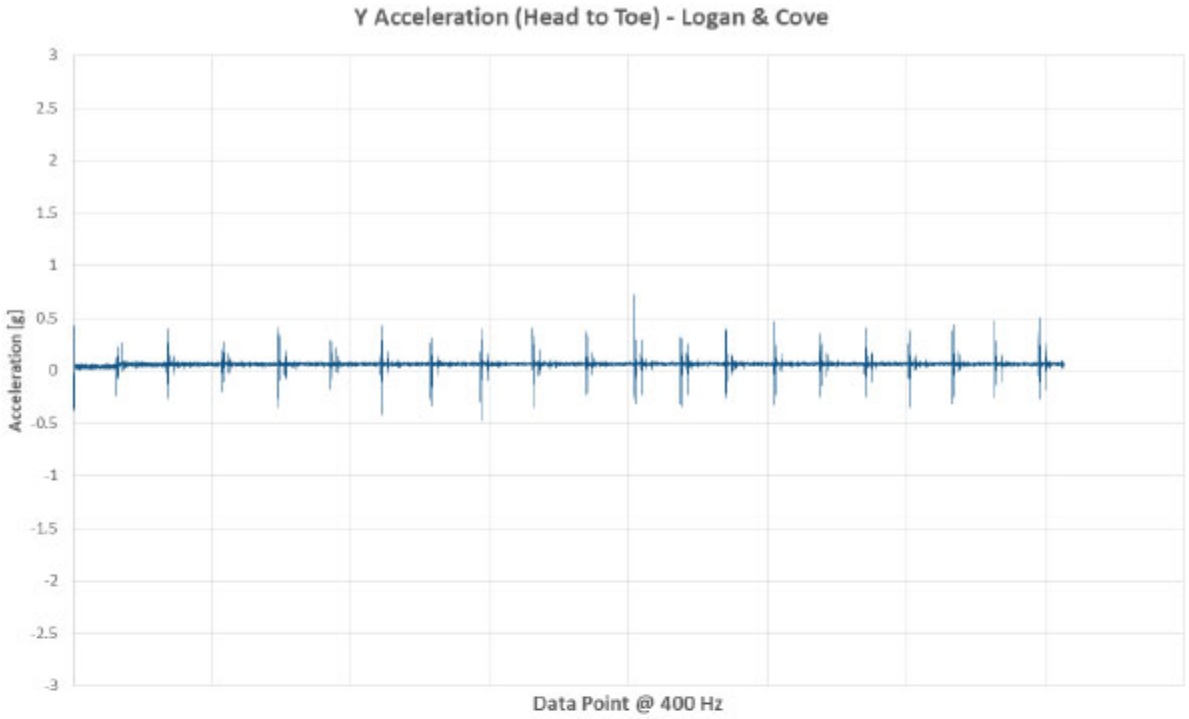

Y Acceleration (Head to Toe) - Hamuq
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

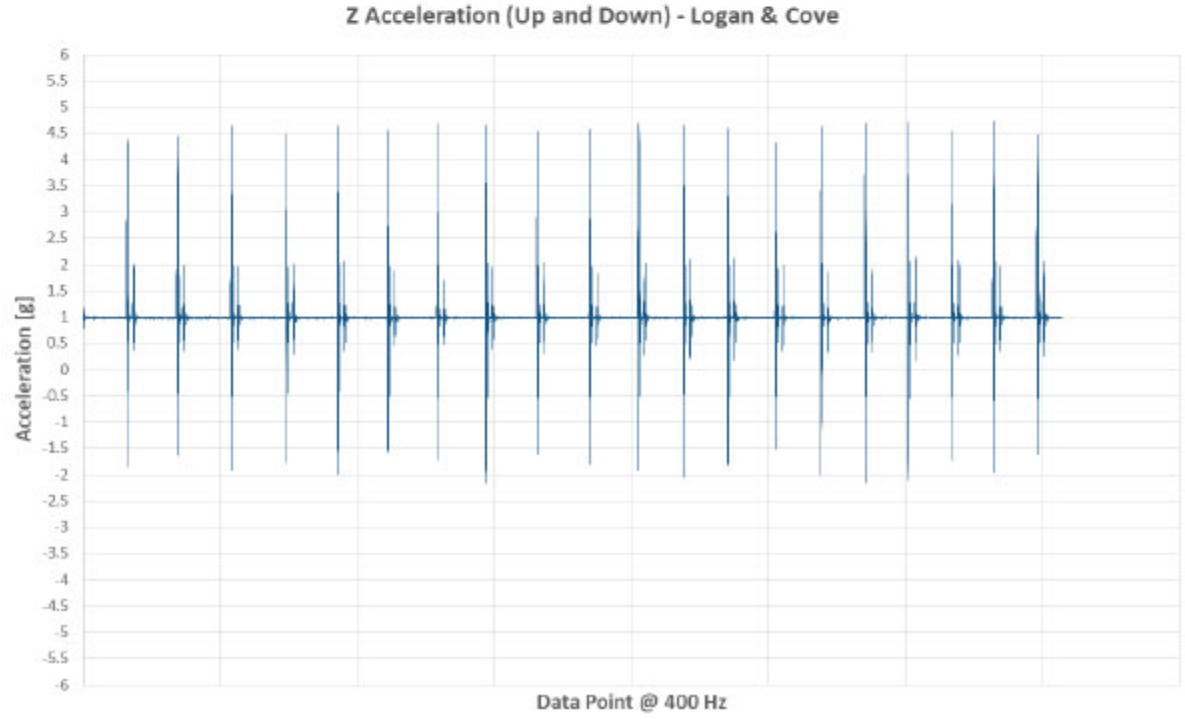

Z Acceleration (Up and Down) - Hamuq
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – LOGAN & COVE

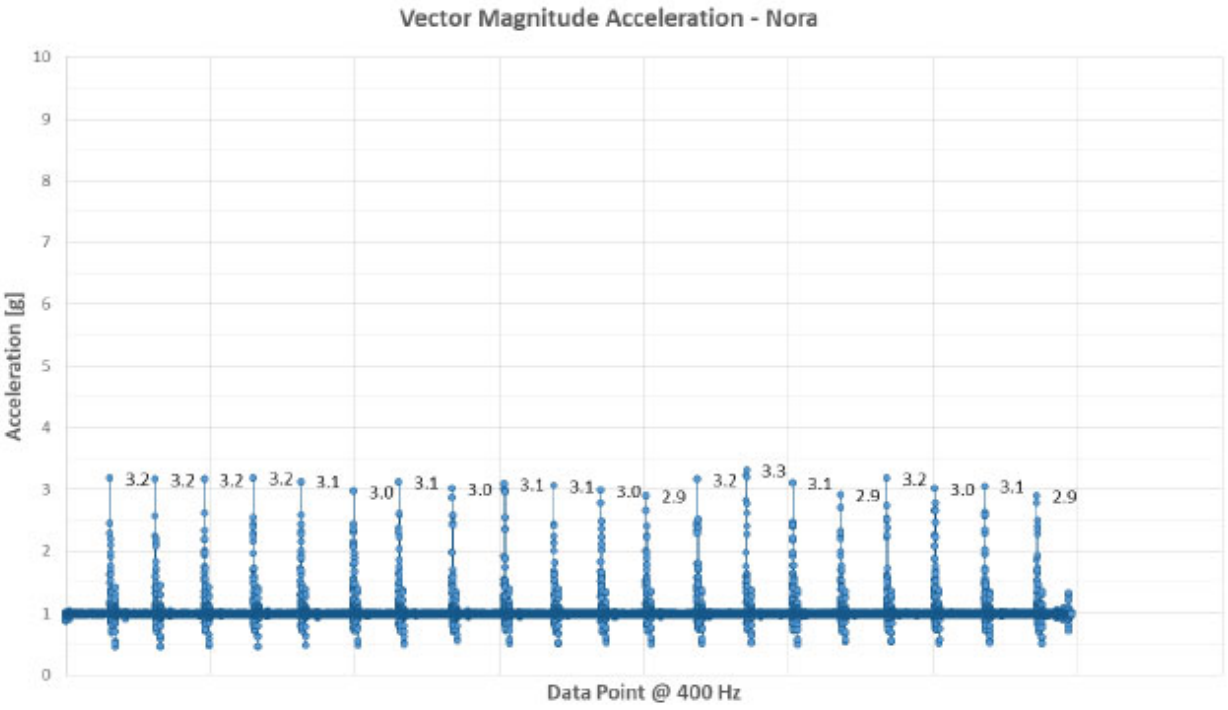


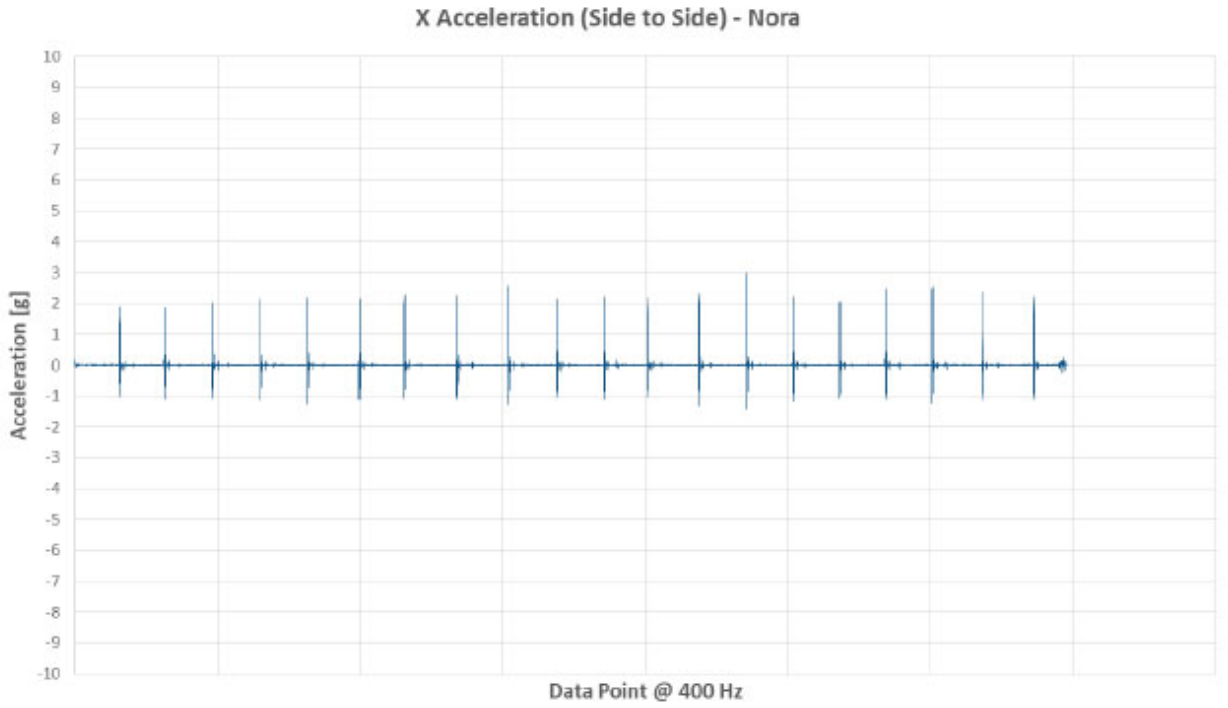


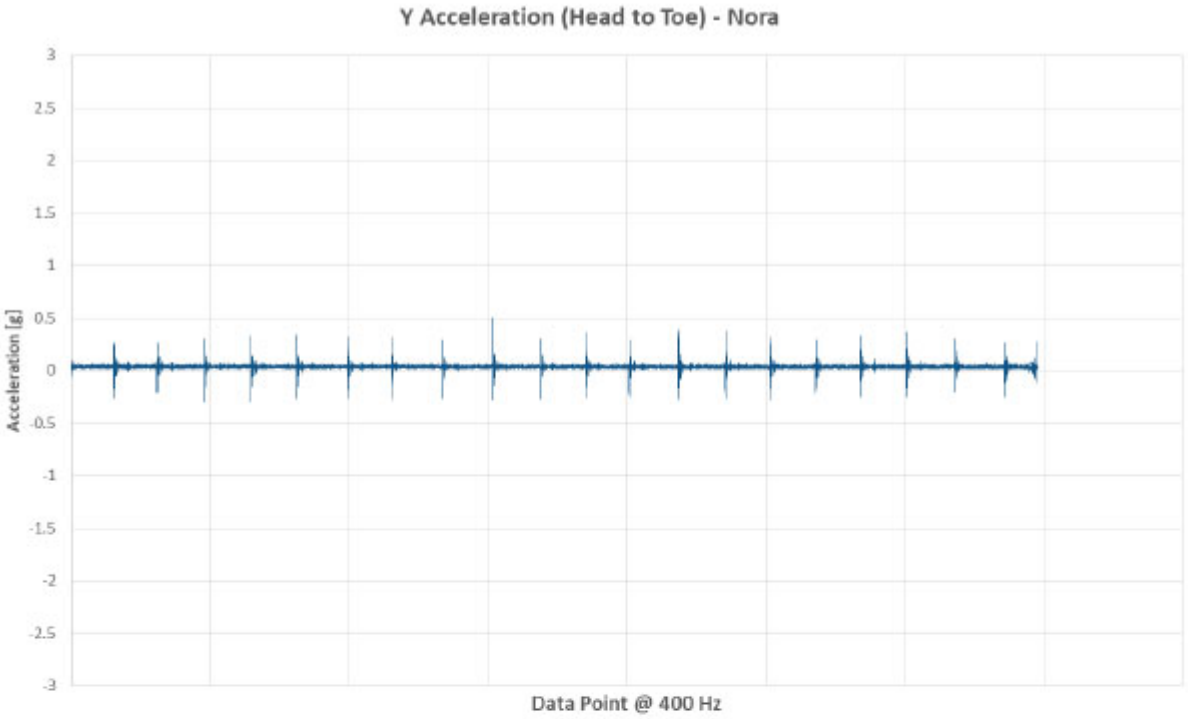

Y Acceleration (Head to Toe) - Logan & Cove
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

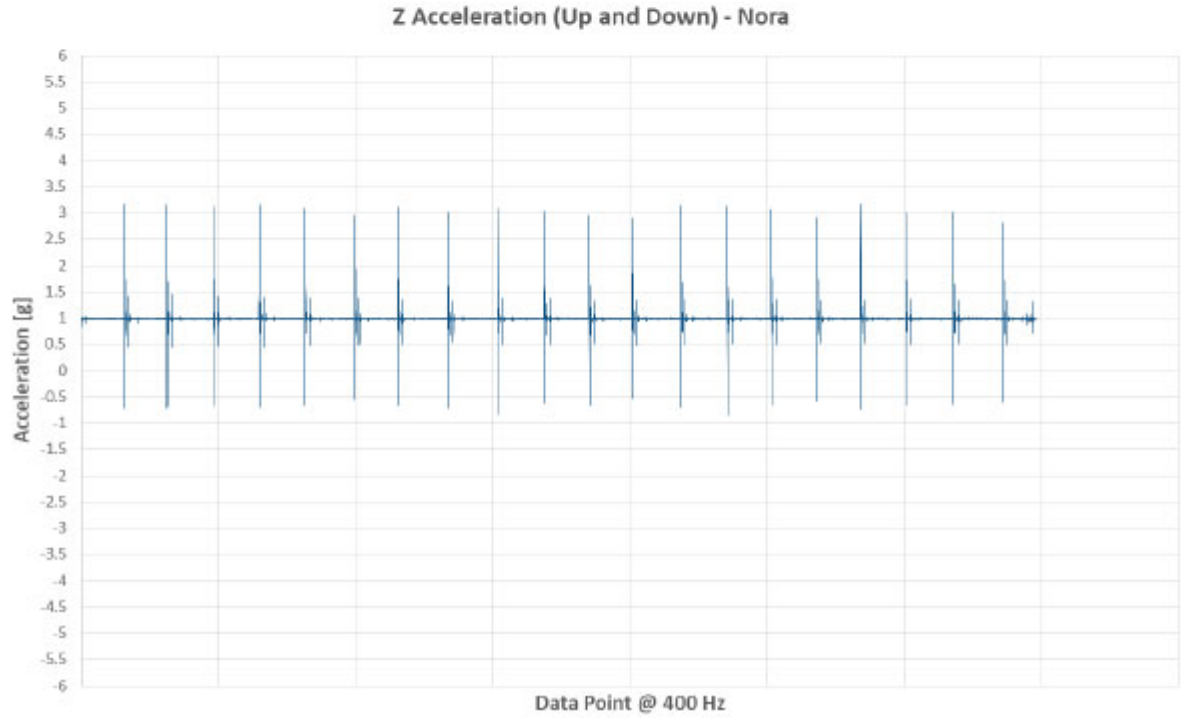

Z Acceleration (Up and Down) - Logan & Cove
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – NORA

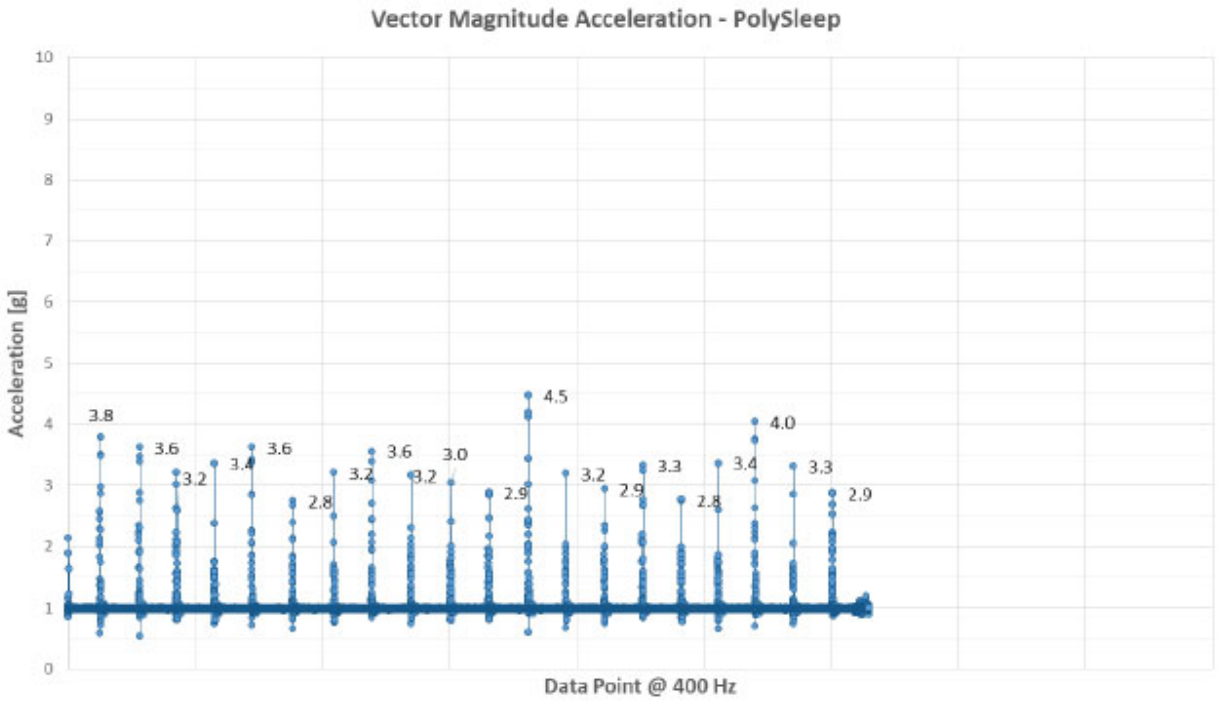

Vector Magnitude Acceleration - Nora
Acceleration [g]
Data Point @ 400 Hz
3.2 3.2 3.2 3.2 3.1 3.0 3.1 3.0 3.1 3.1 3.0 2.9 3.2 3.3 3.1 2.9 3.2 3.0 3.1 2.9

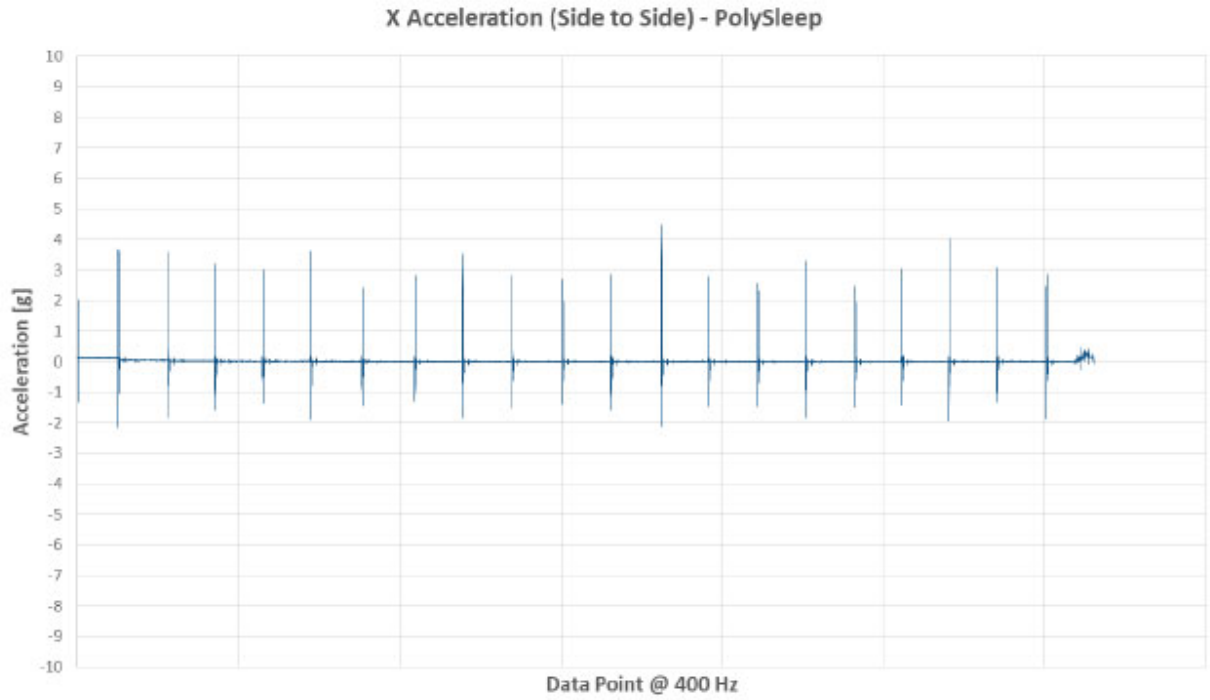

X Acceleration (Side to Side) - Nora
Acceleration [g]
Data Point @ 400 Hz

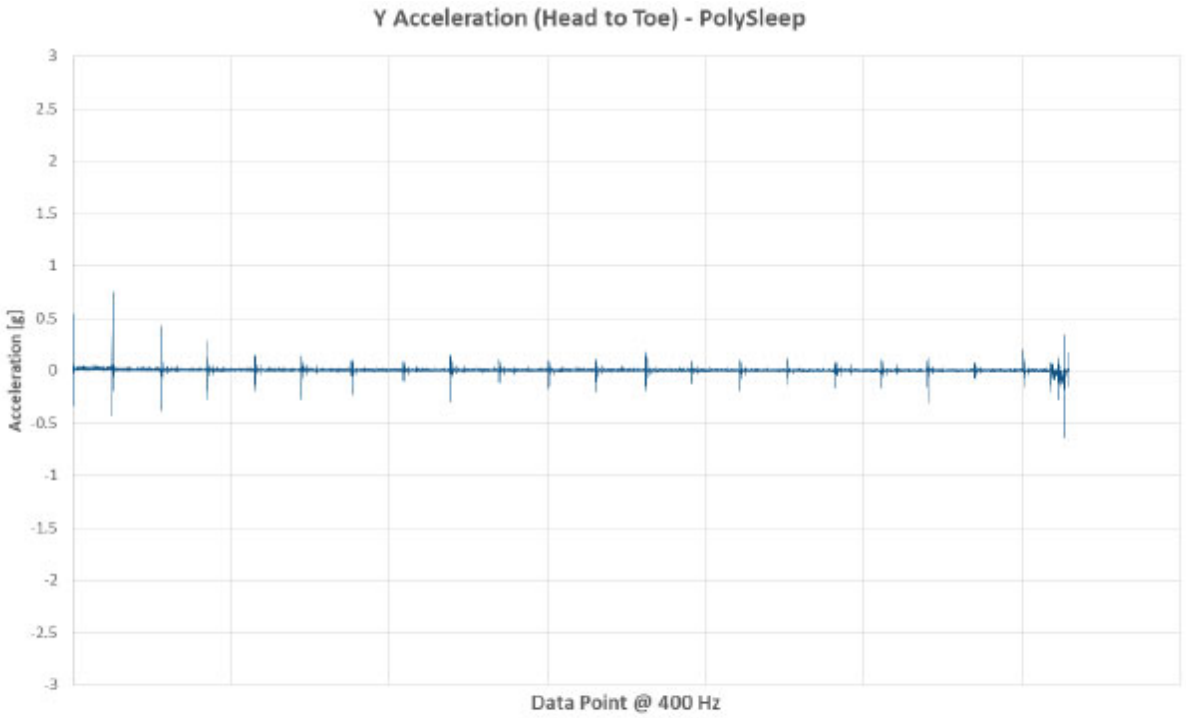

Y Acceleration (Head to Toe) - Nora
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

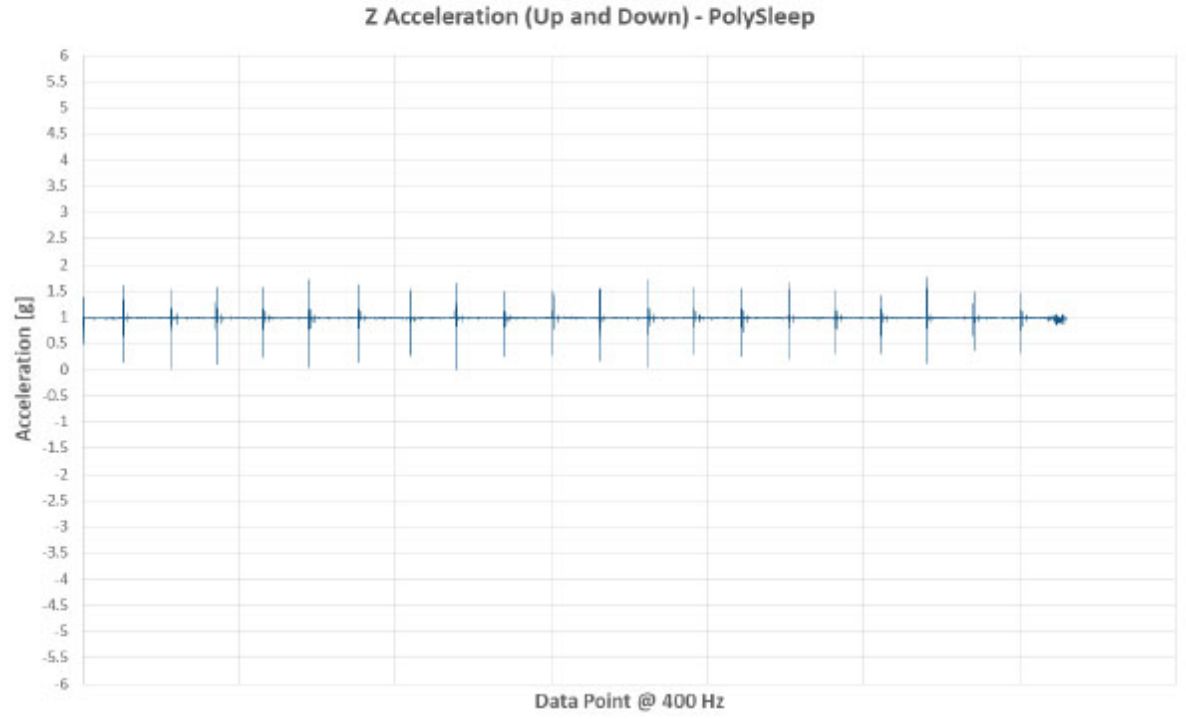

Z Acceleration (Up and Down) - Nora
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – POLYSLEEP

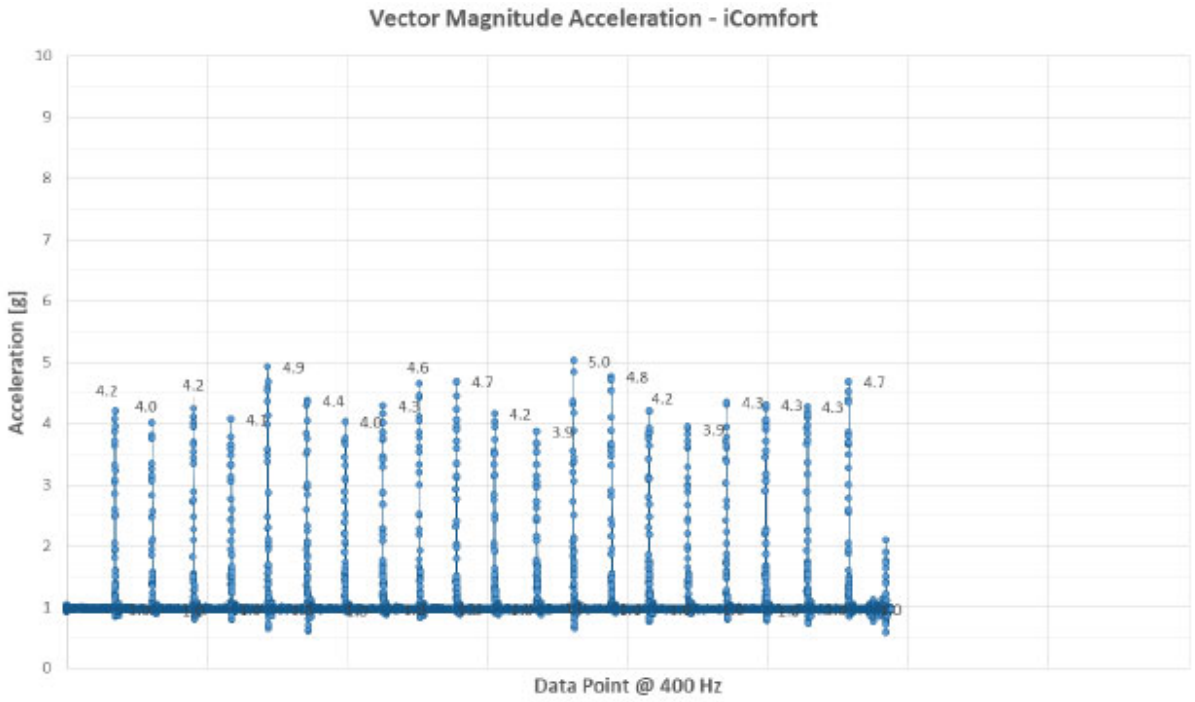


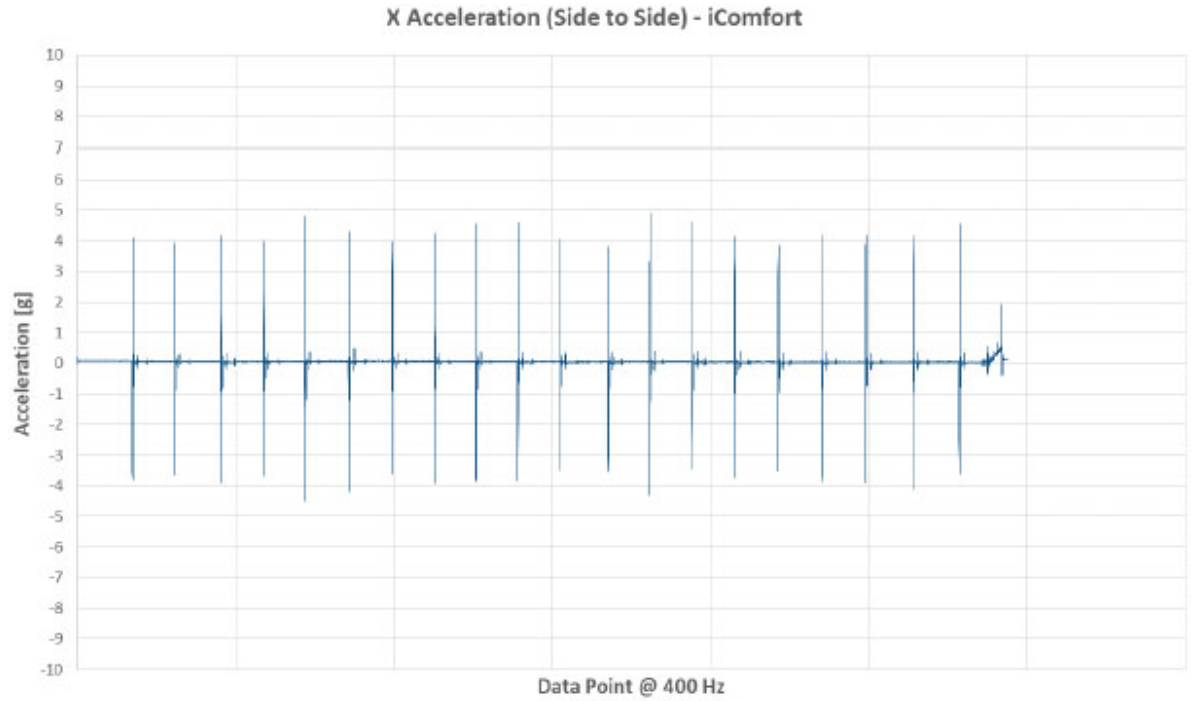


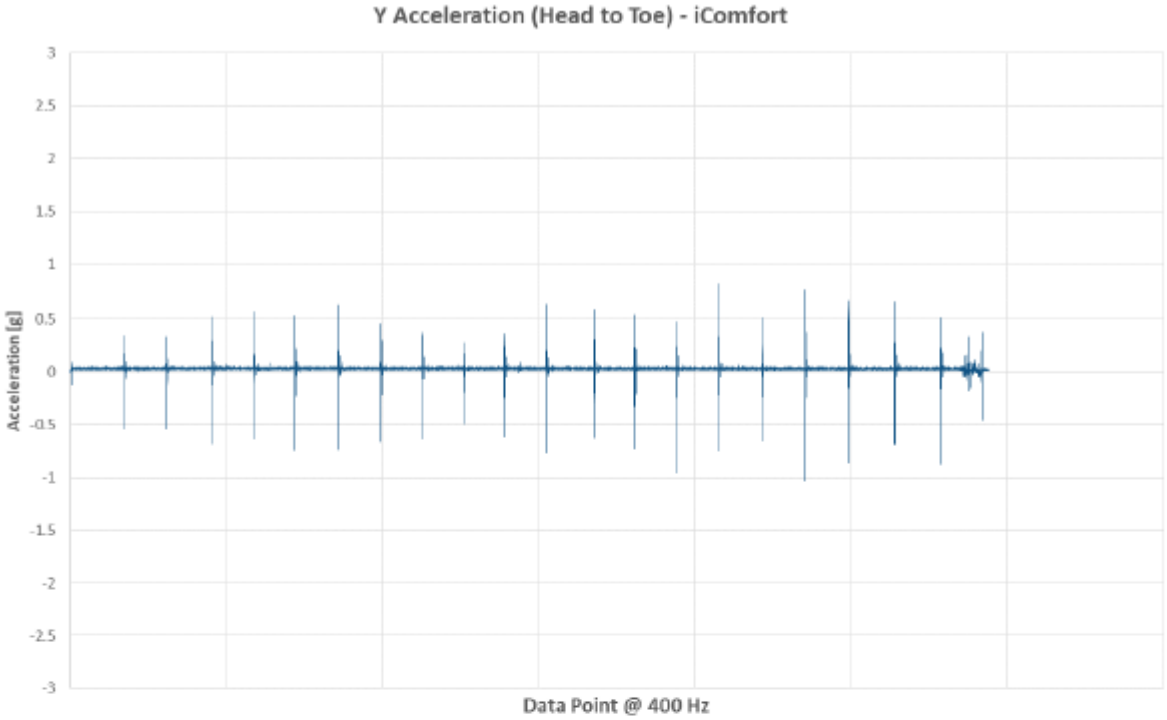

Y Acceleration (Head to Toe) - PolySleep
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

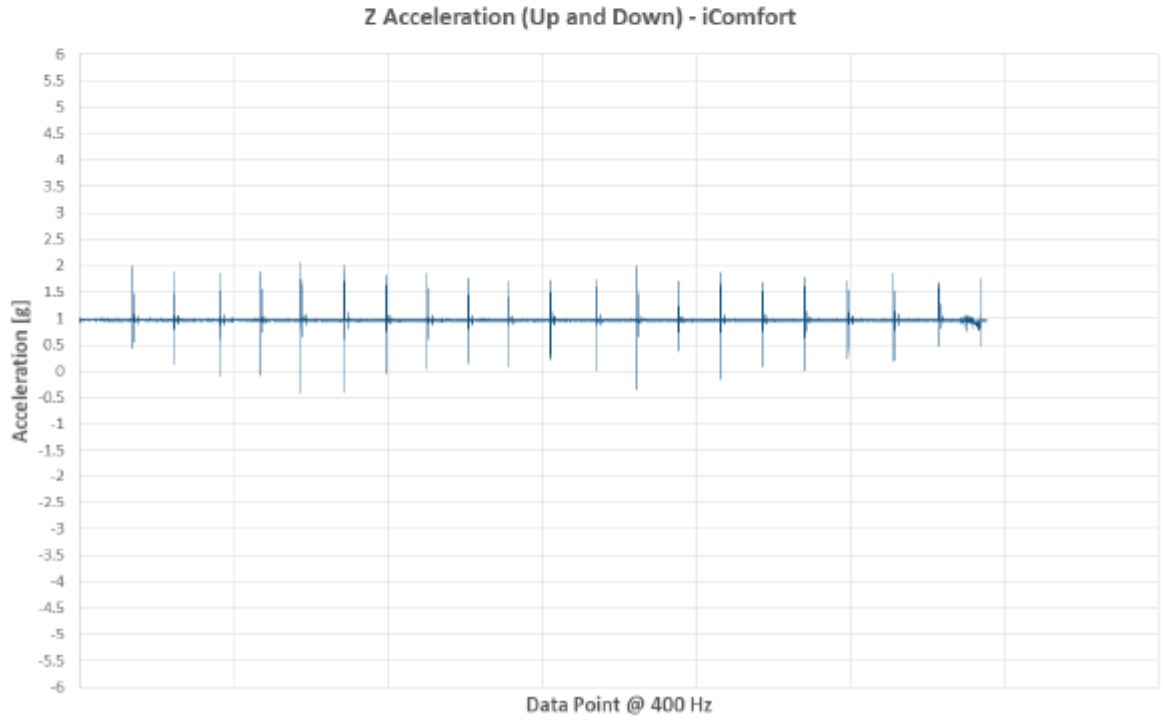

Z Acceleration (Up and Down) - PolySleep
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – ICOMFORT

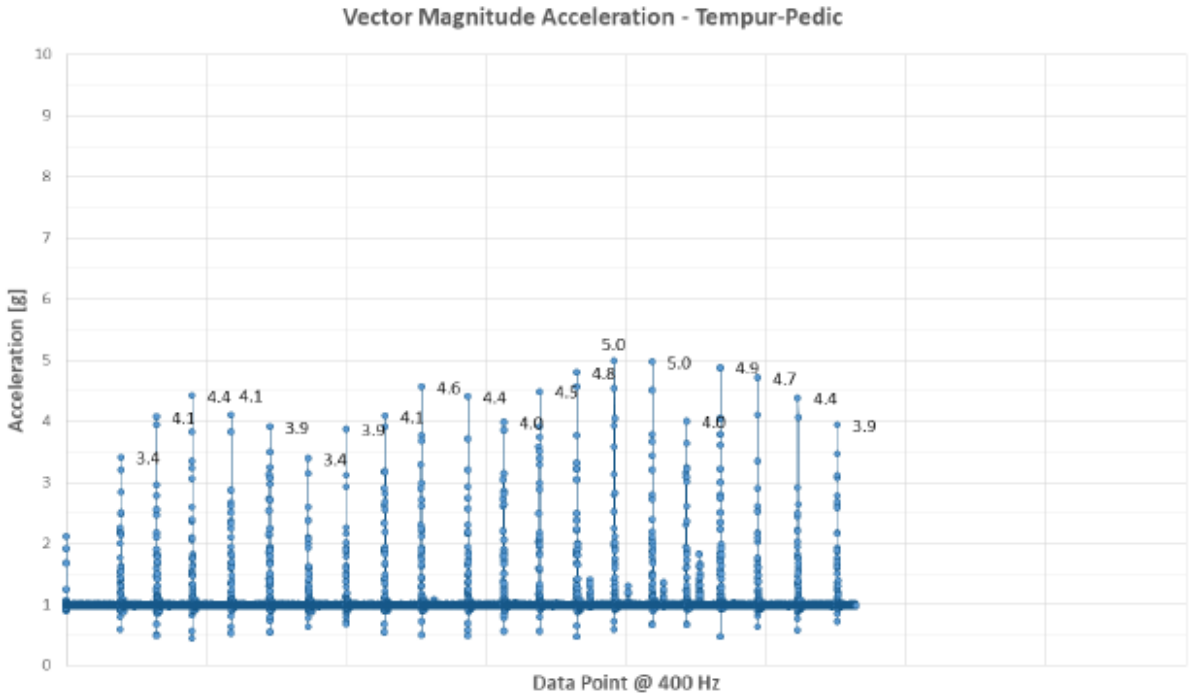


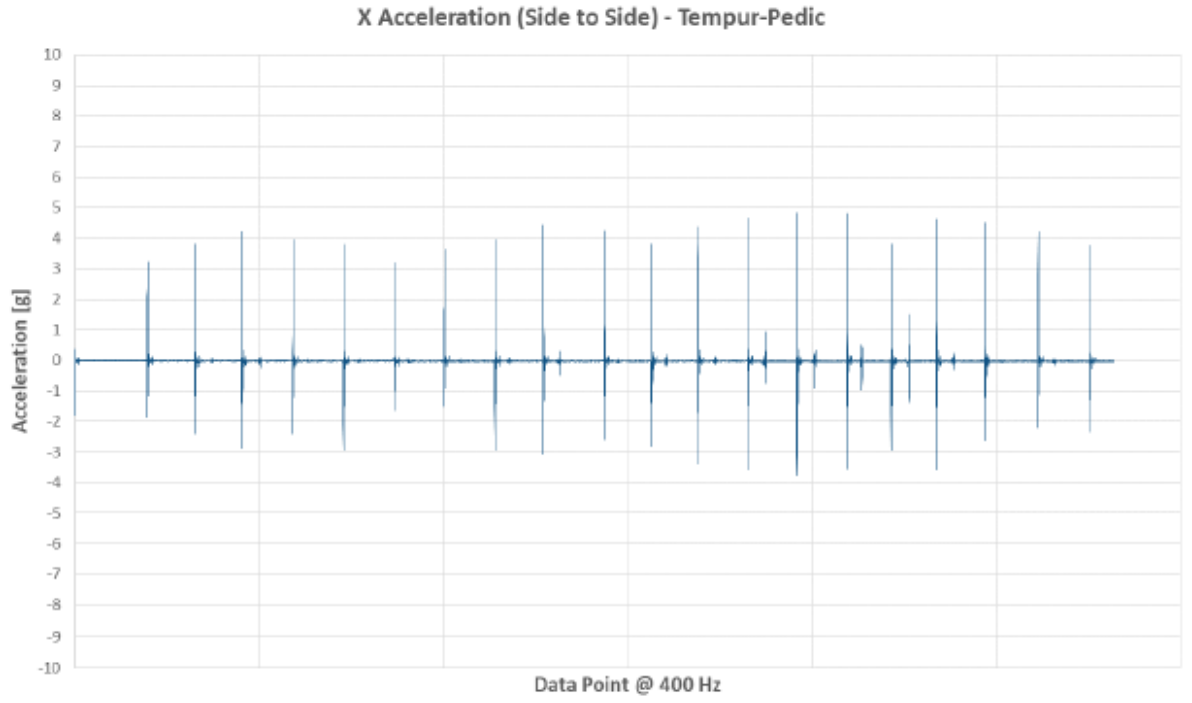


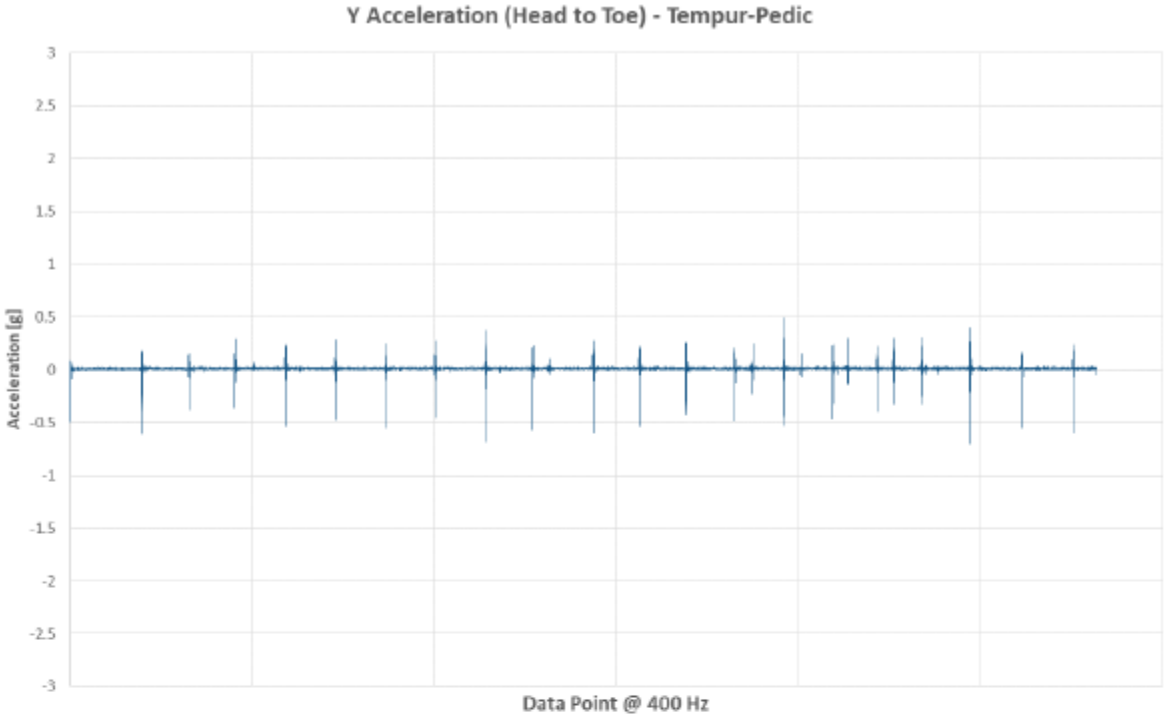

Y Acceleration (Head to Toe) - iComfort
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

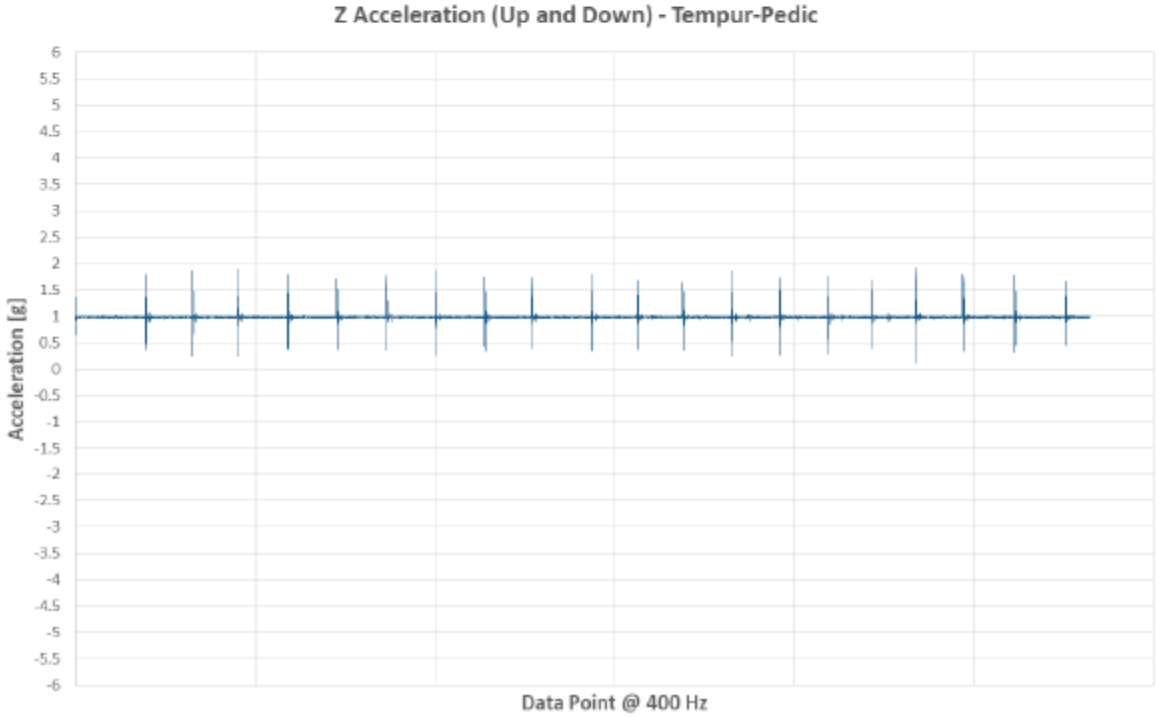

Z Acceleration (Up and Down) - iComfort
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – TEMPUR-PEDIC

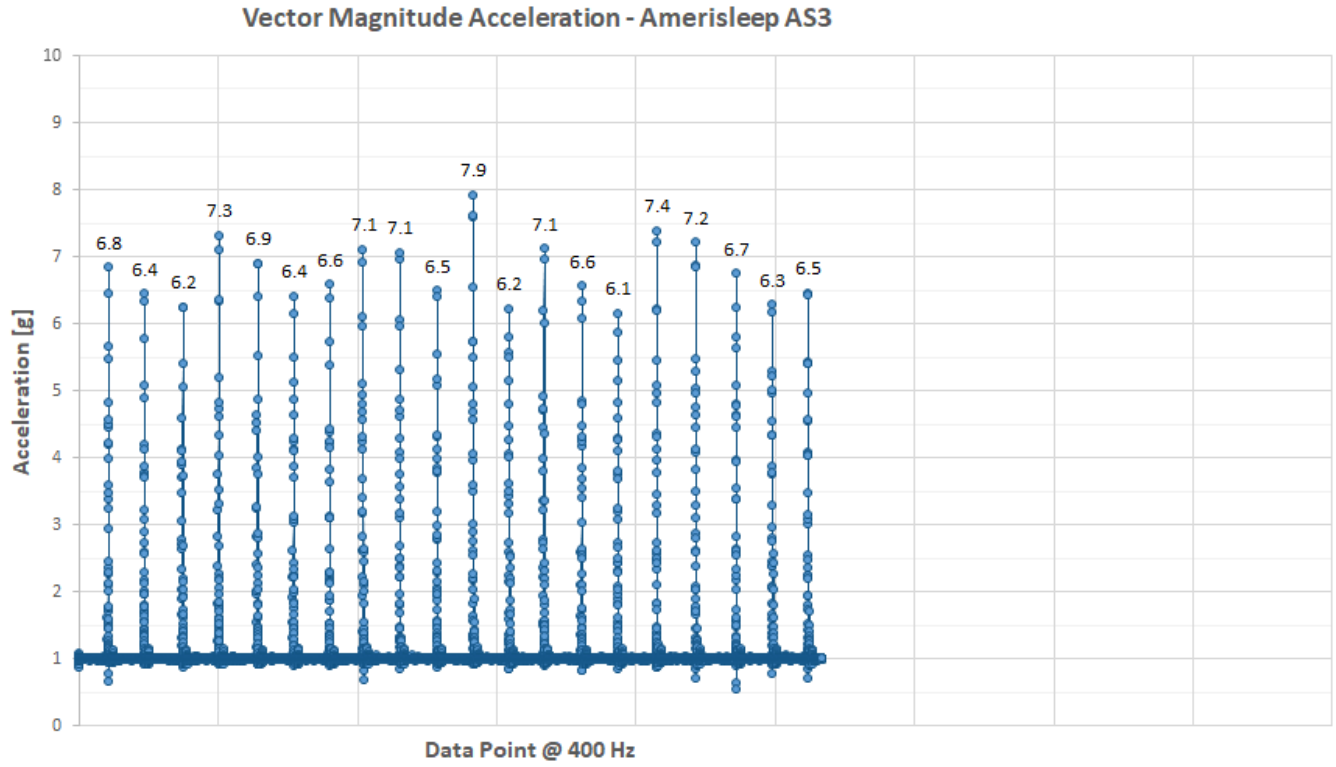


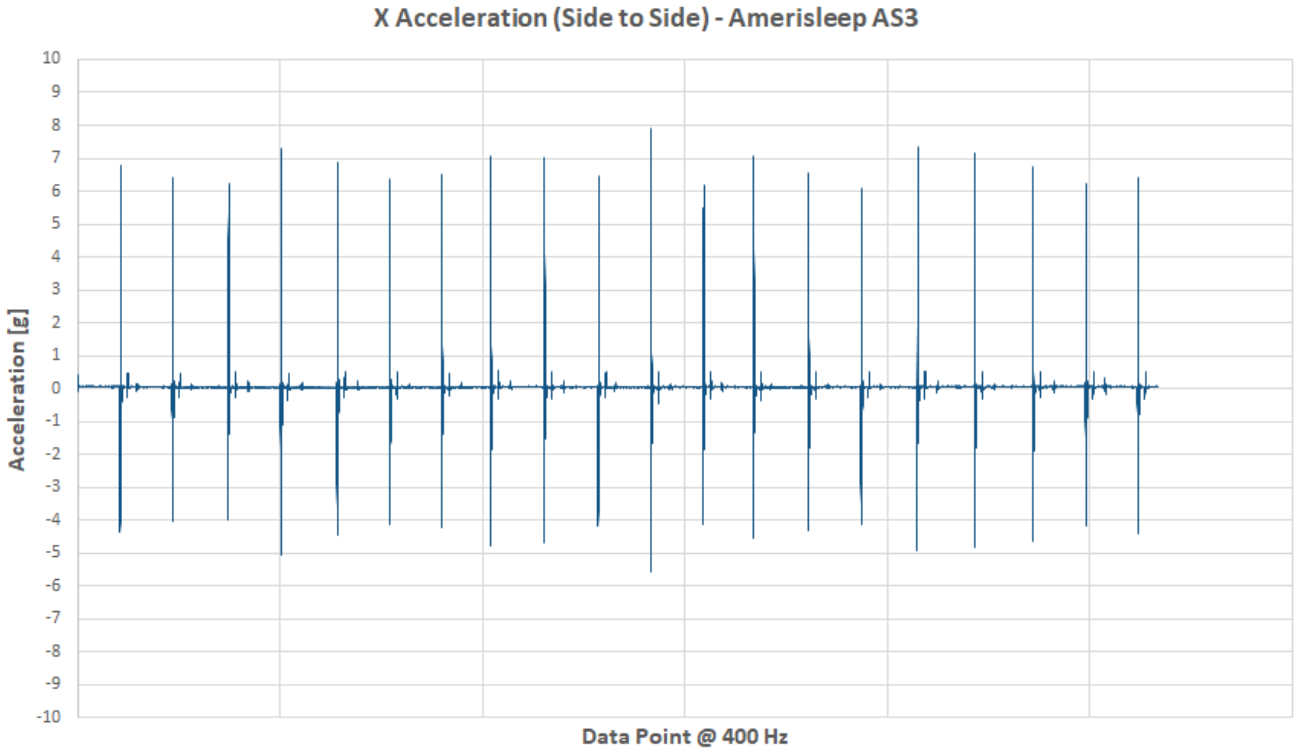


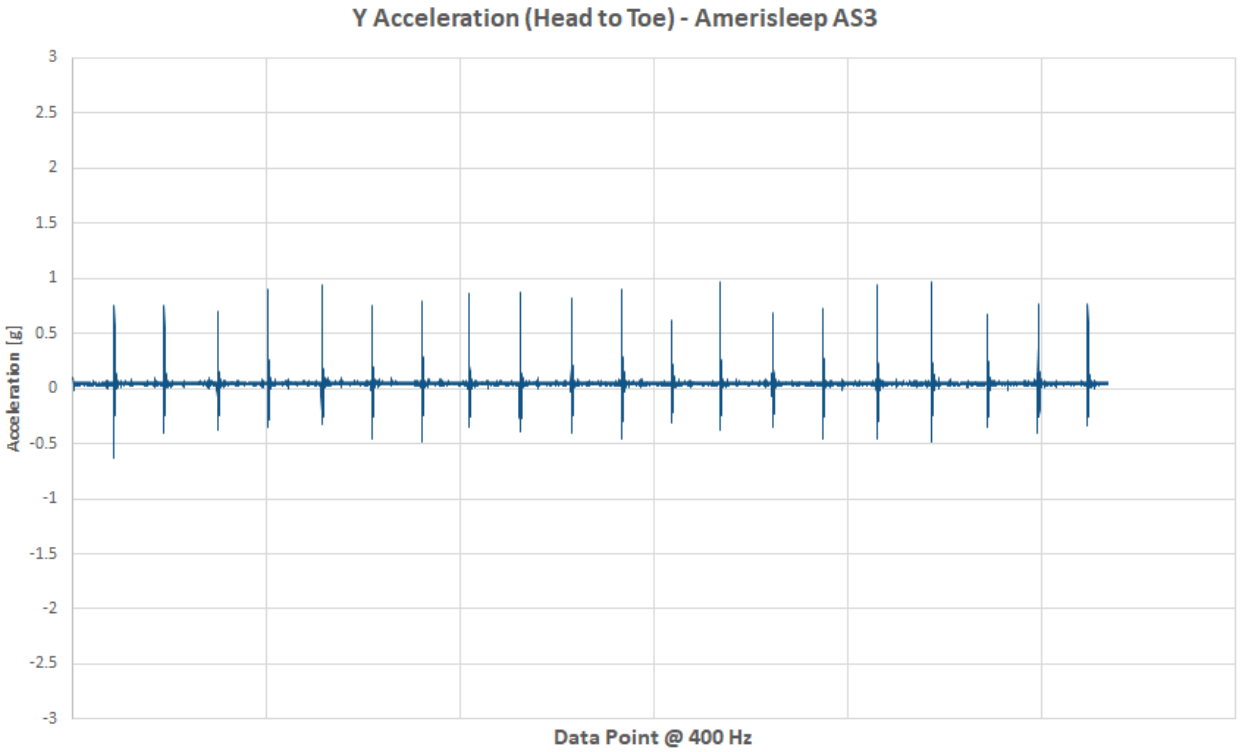

Y Acceleration (Head to Toe) - Tempur-Pedic
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

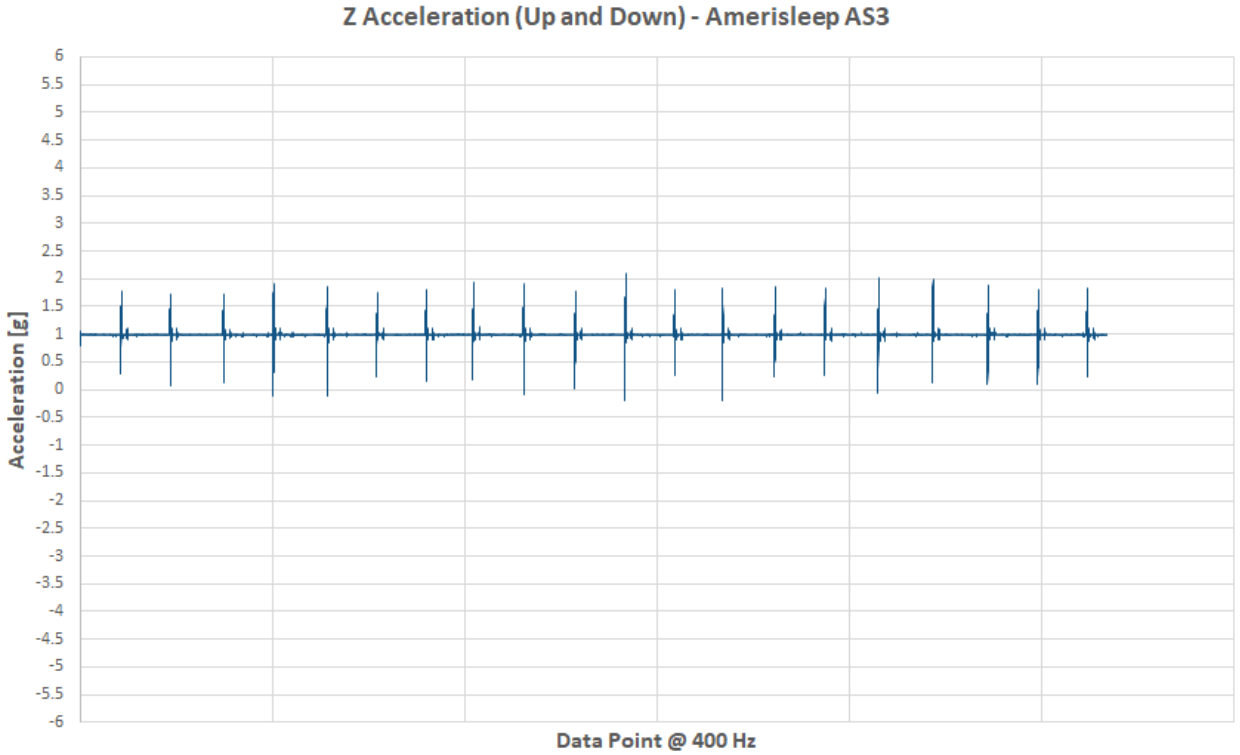

Z Acceleration (Up and Down) - Tempur-Pedic
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – AMERISLEEP AS3

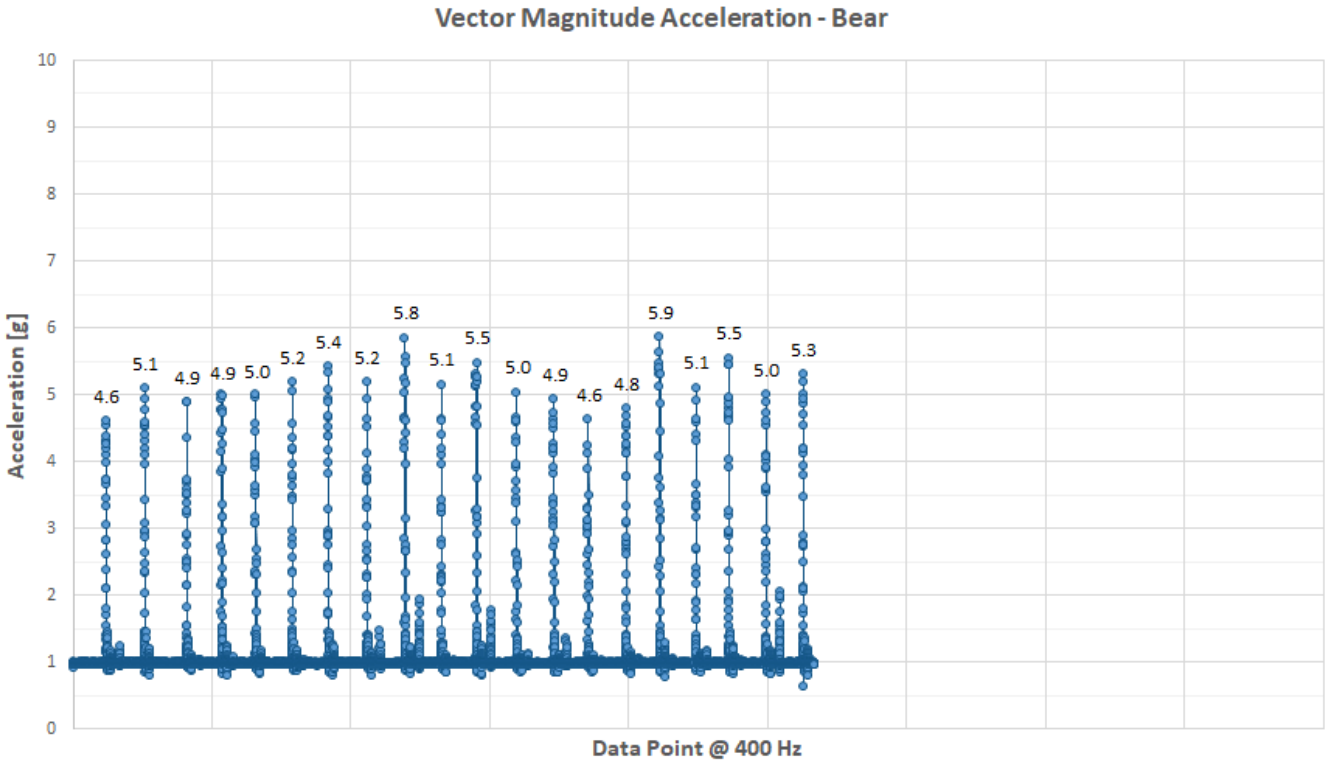


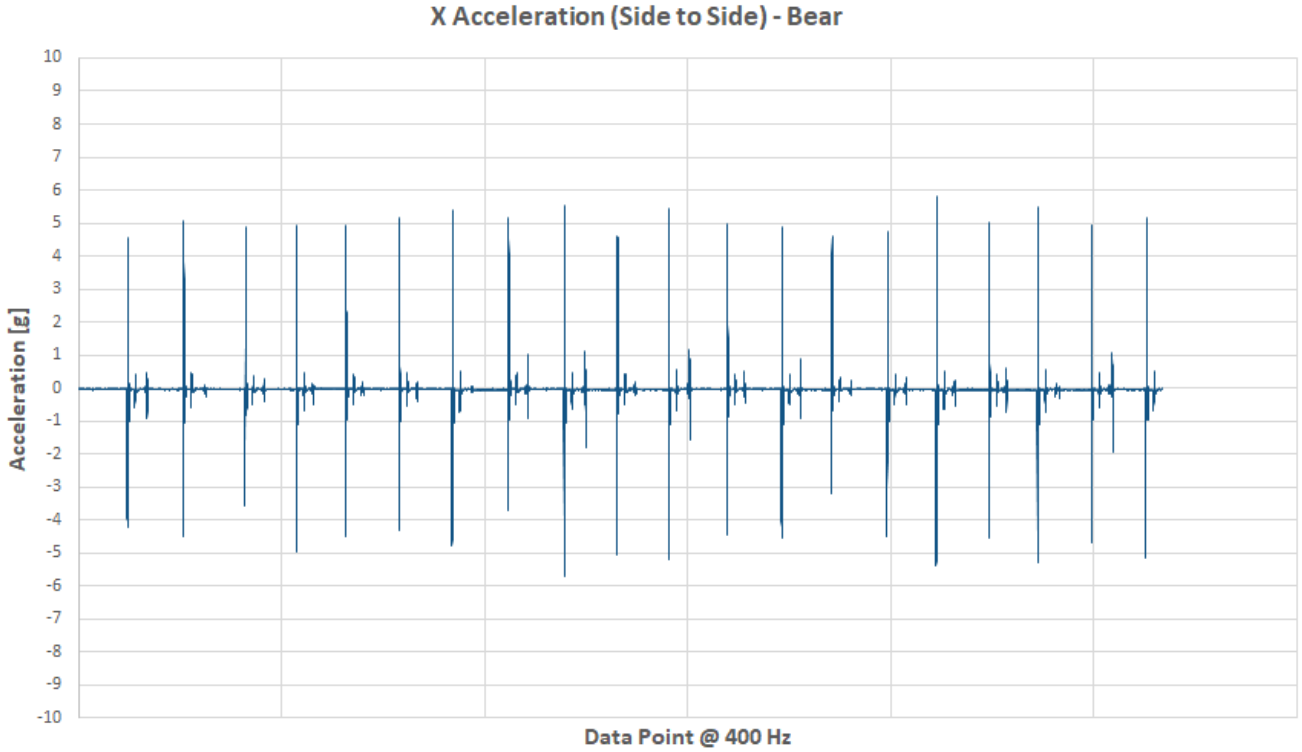


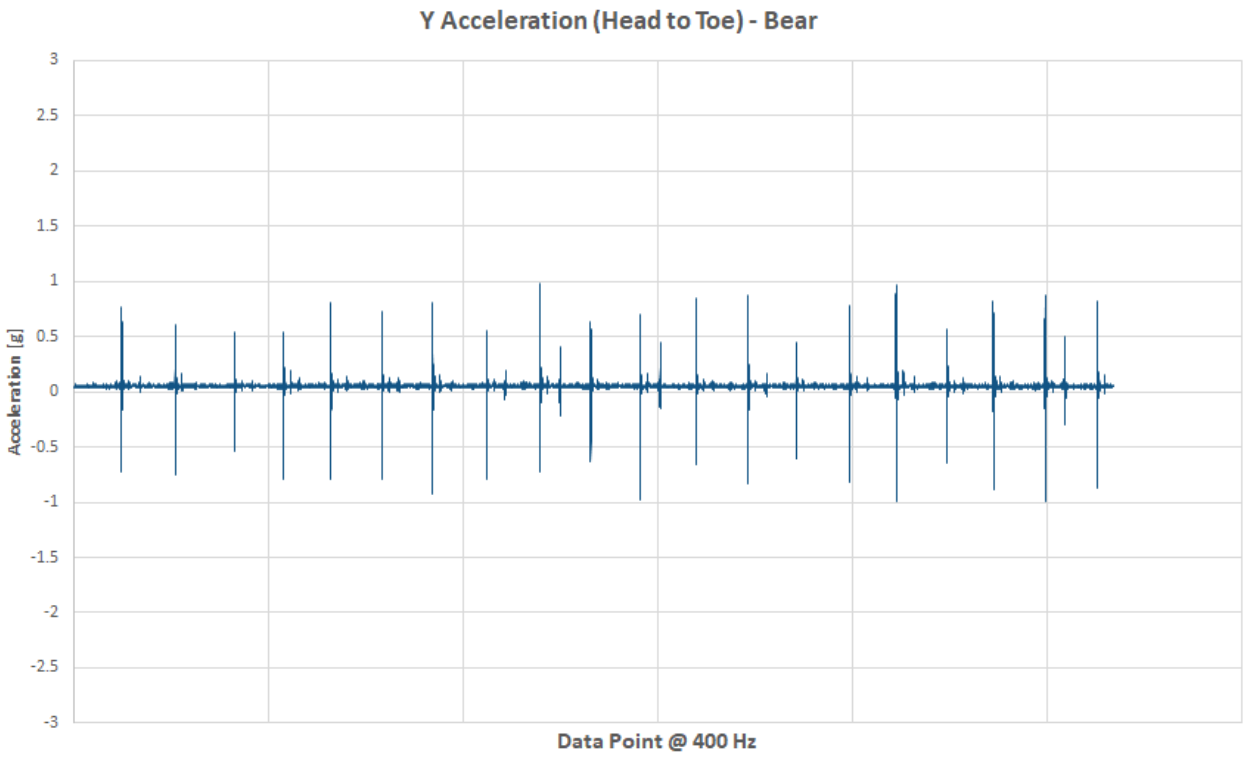

Y Acceleration (Head to Toe) - Amerisleep AS3
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

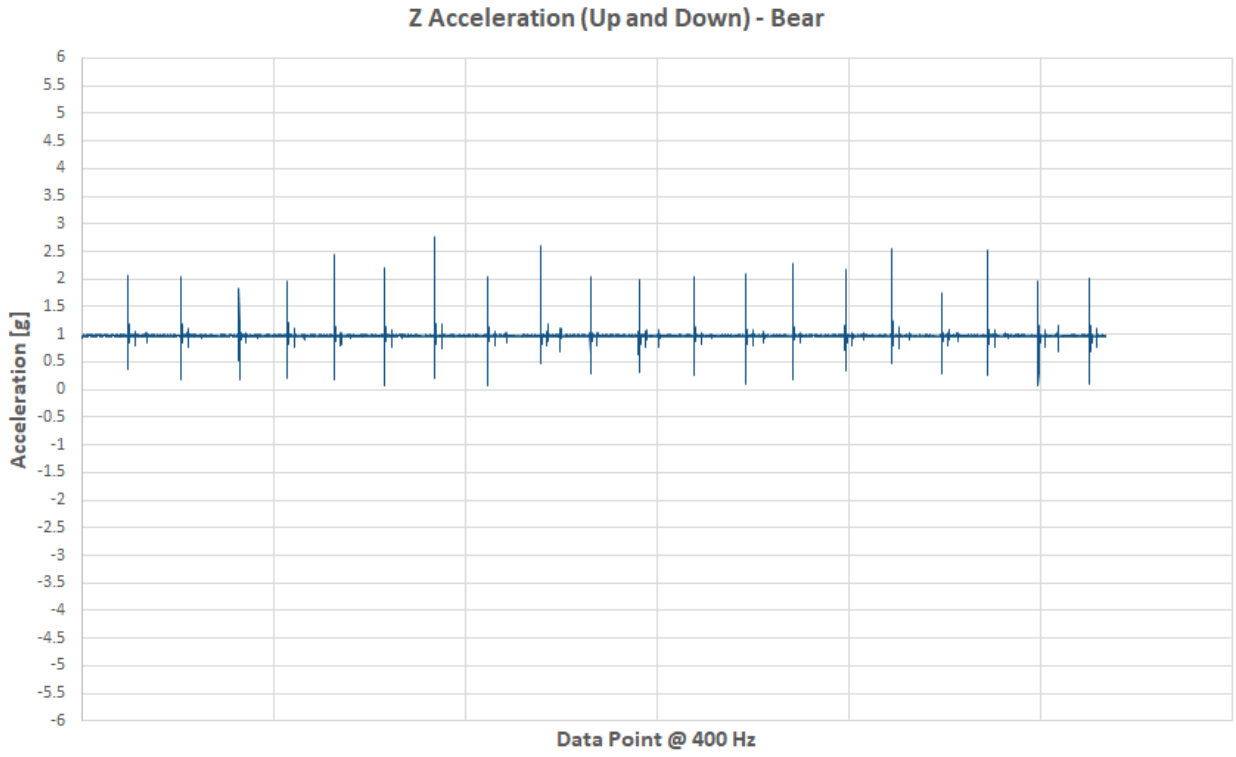

Z Acceleration (Up and Down) - Amerisleep AS3
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – BEAR

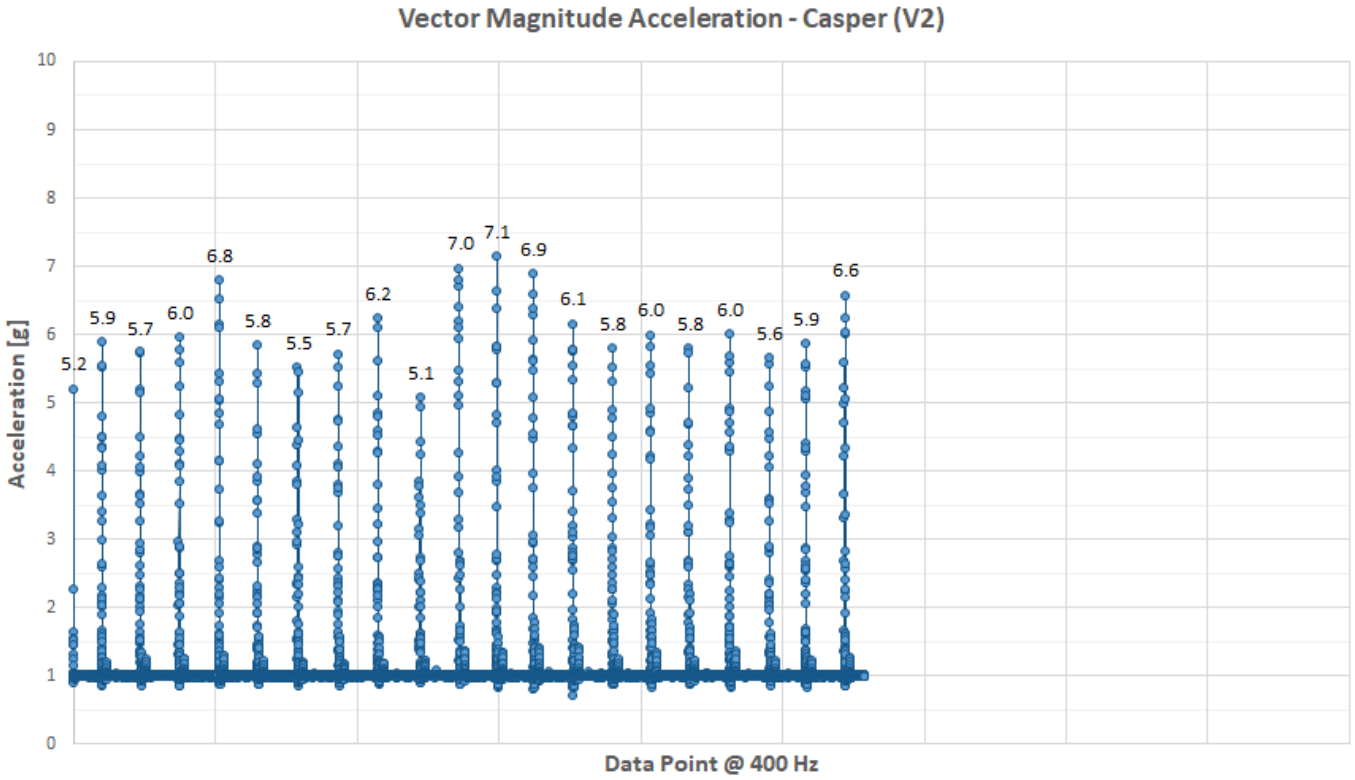

Vector Magnitude Acceleration - Bear
Acceleration [g]
Data Point @ 400 Hz
4.6
5.1
4.9
4.9
5.0
5.2
5.4
5.2
5.8
5.1
5.5
5.0
4.9
4.6
4.8
5.9
5.1
5.5
5.0
5.3

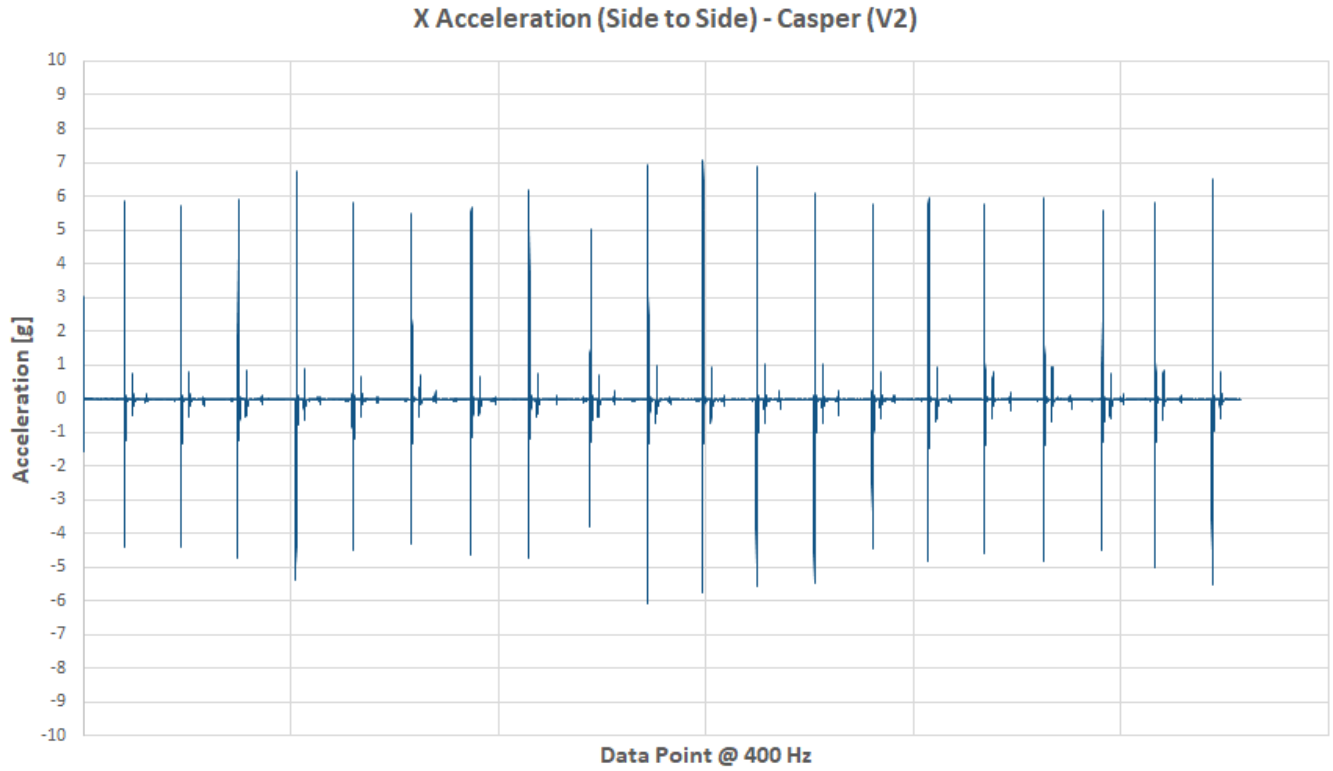

X Acceleration (Side to Side) - Bear
Acceleration [g]
Data Point @ 400 Hz

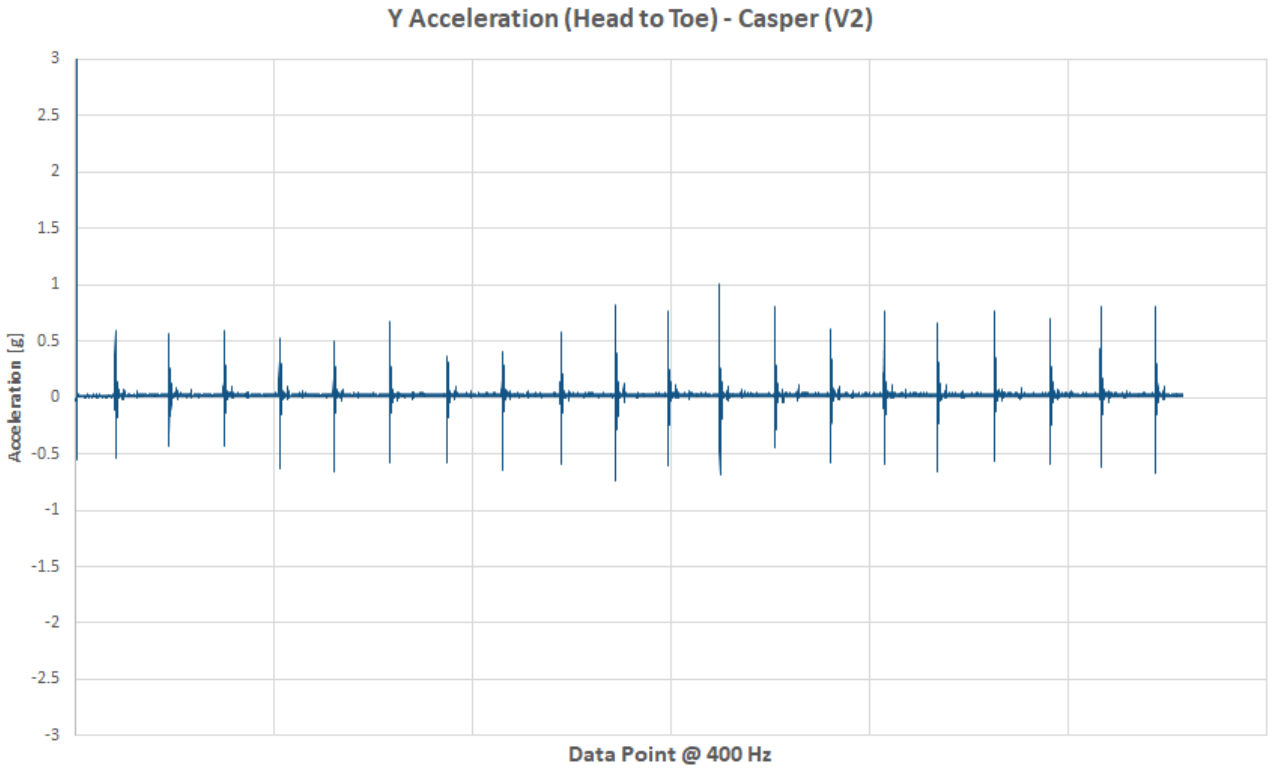

Y Acceleration (Head to Toe) - Bear
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

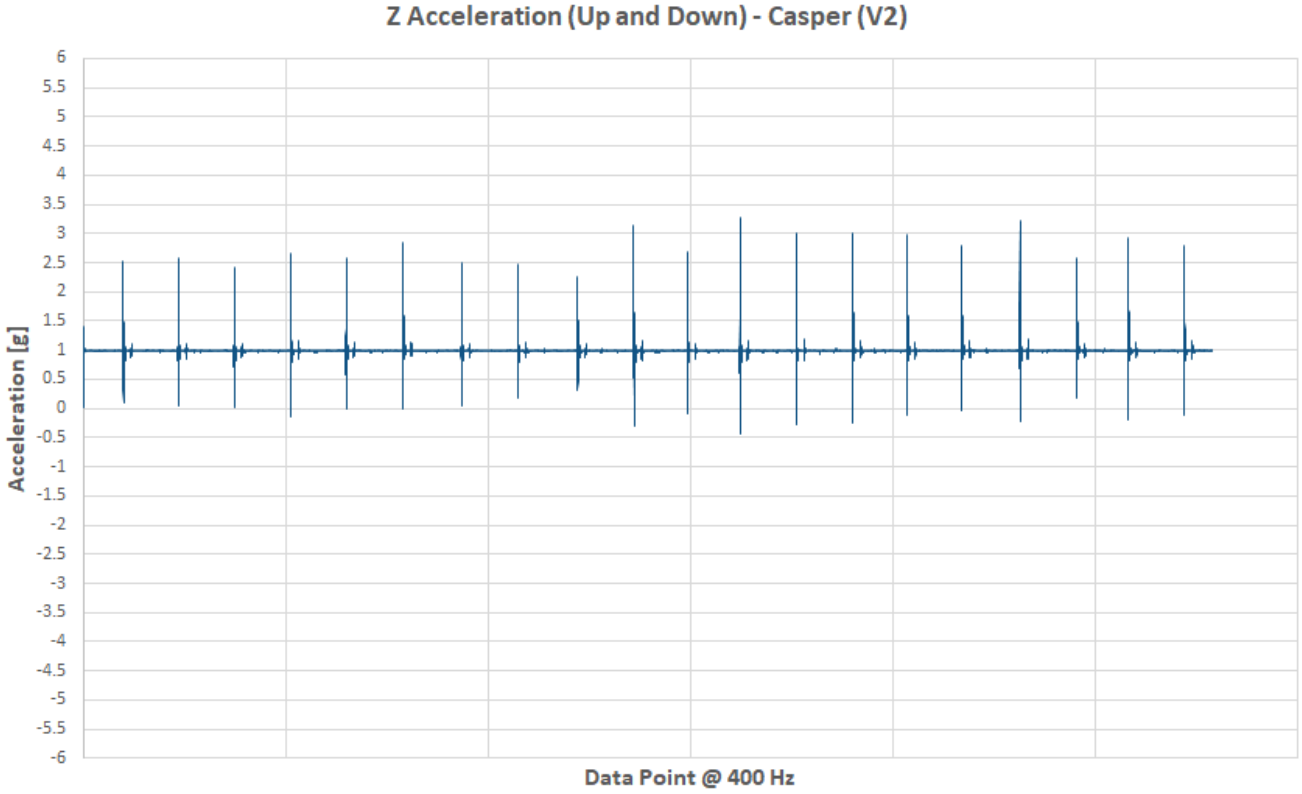

Z Acceleration (Up and Down) - Bear
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – CASPER (V2)

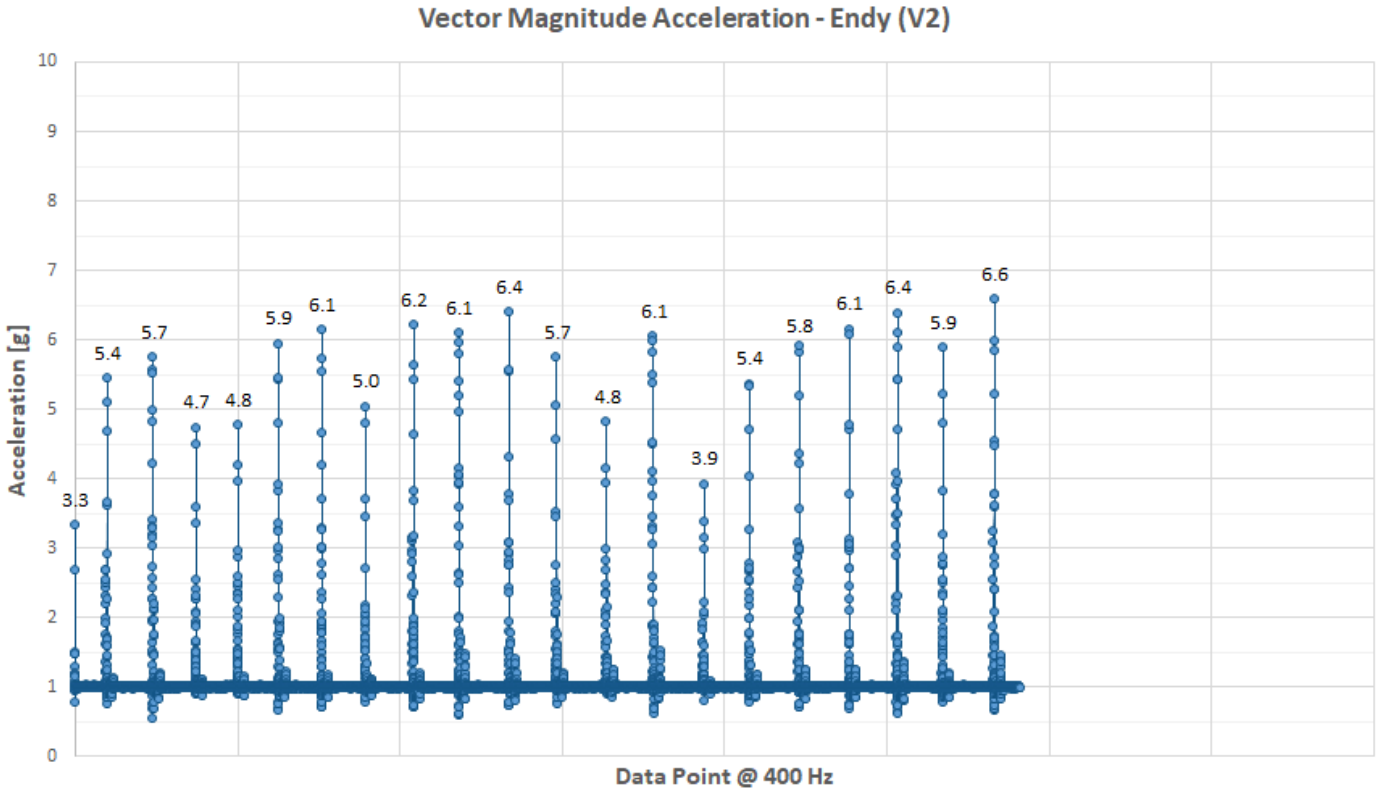


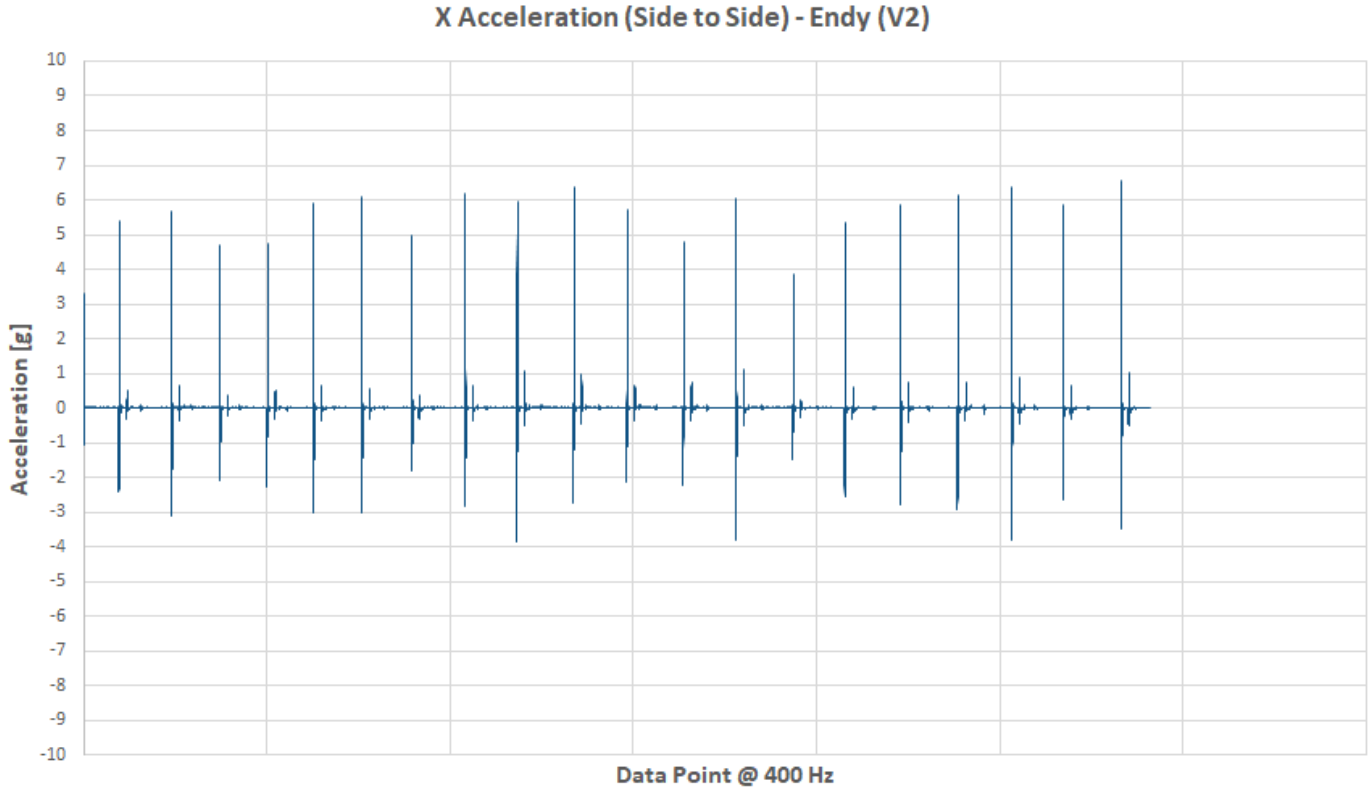


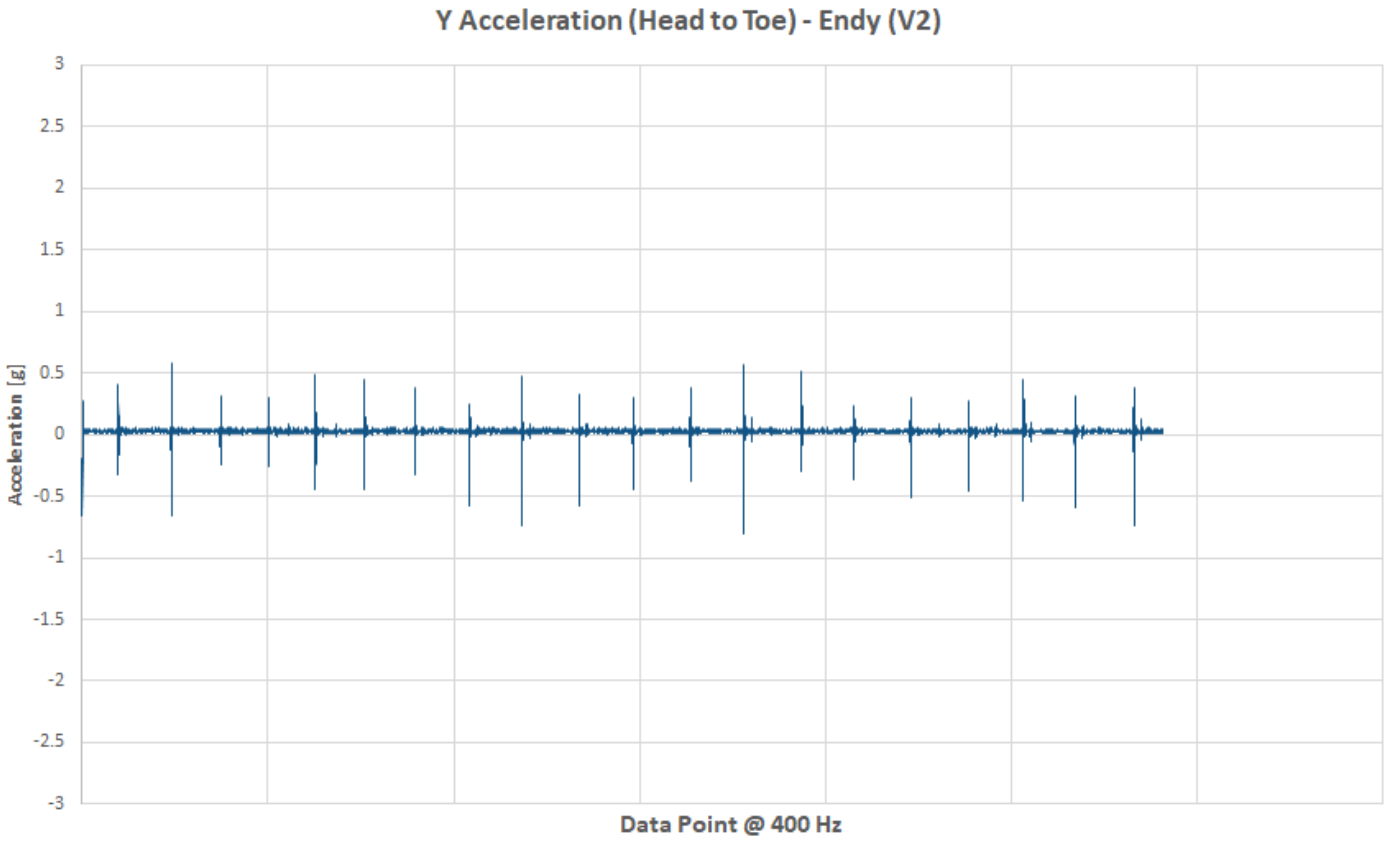

Y Acceleration (Head to Toe) - Casper (V2)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

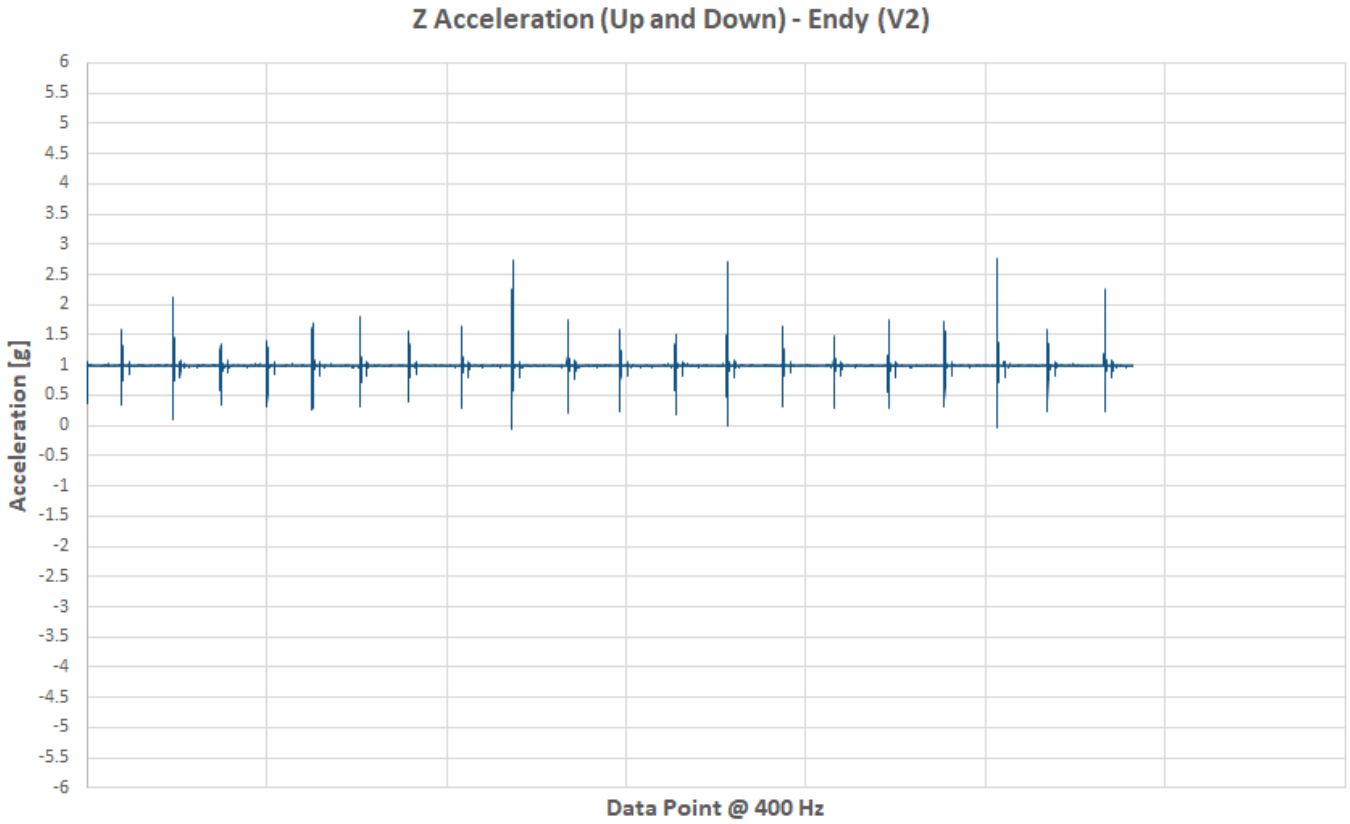

Z Acceleration (Up and Down) - Casper (V2)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – ENDY (V2)

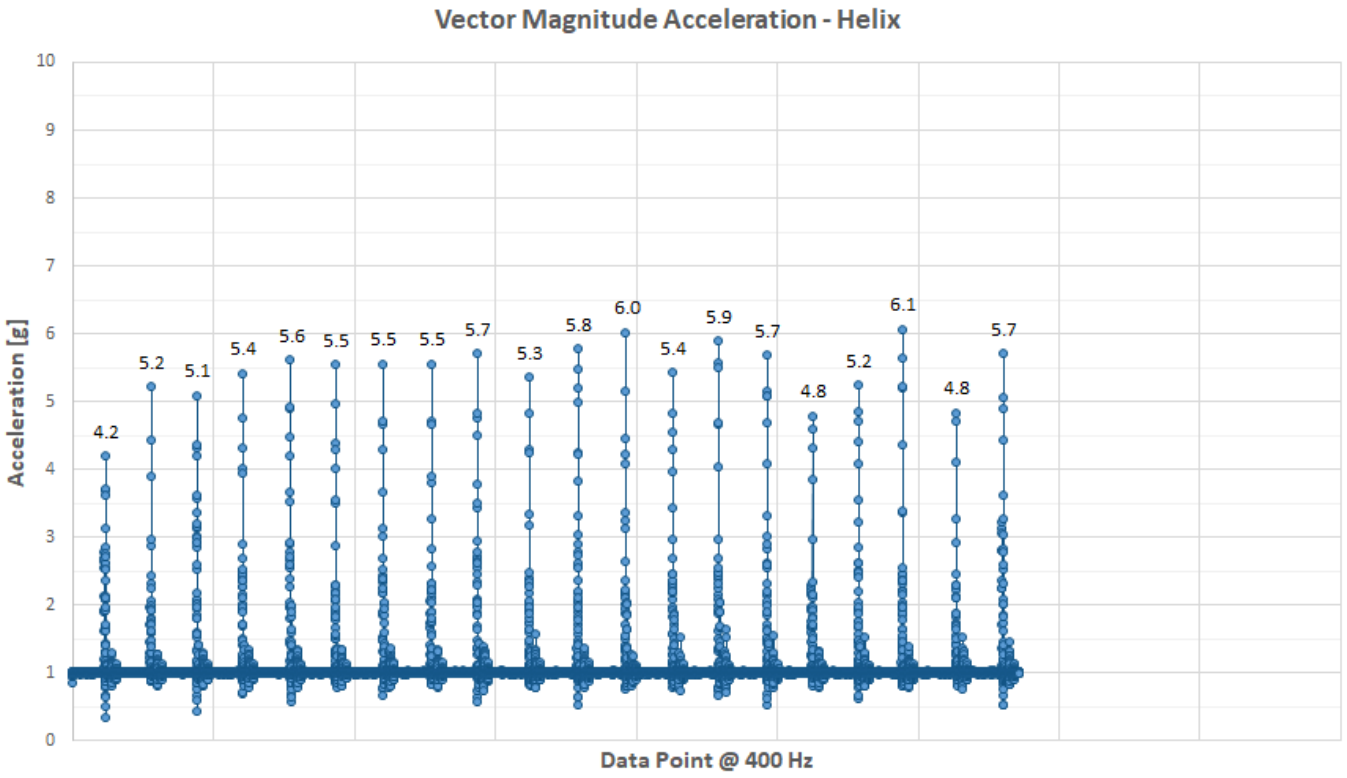


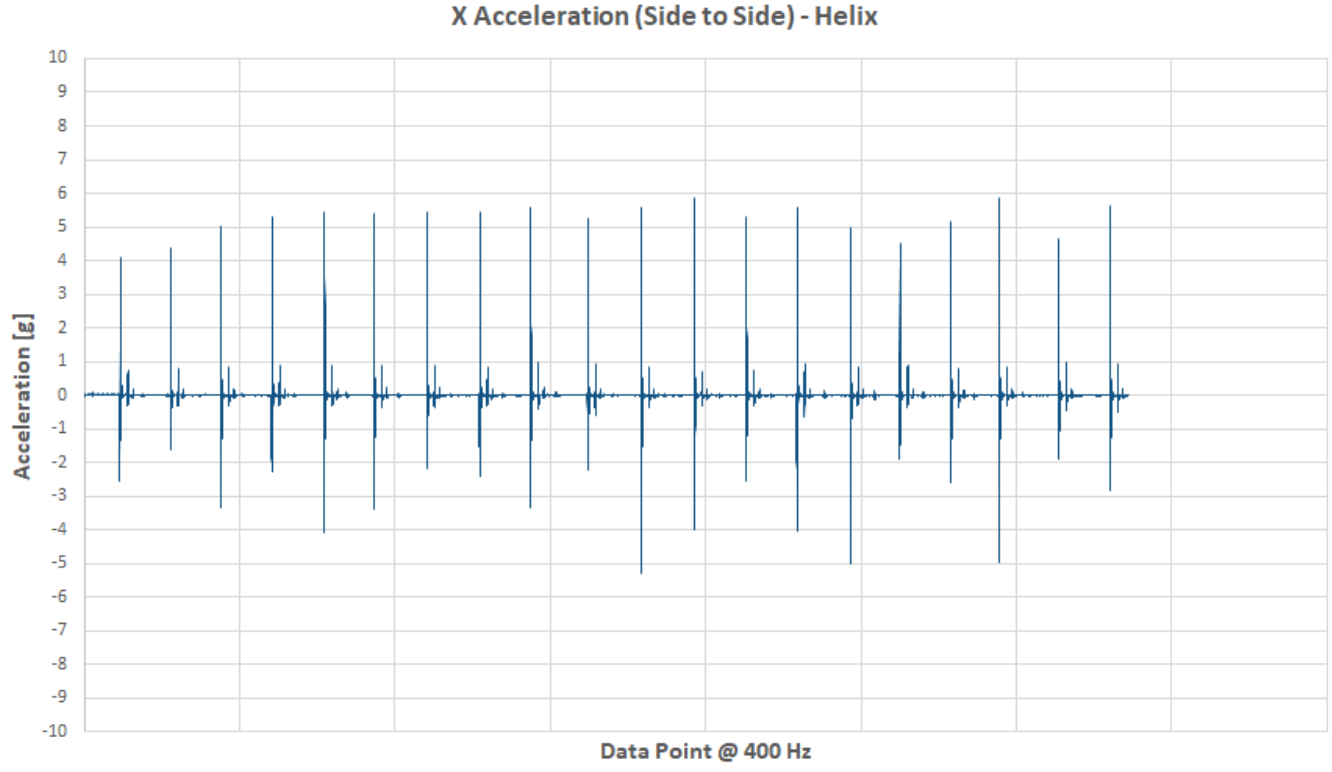


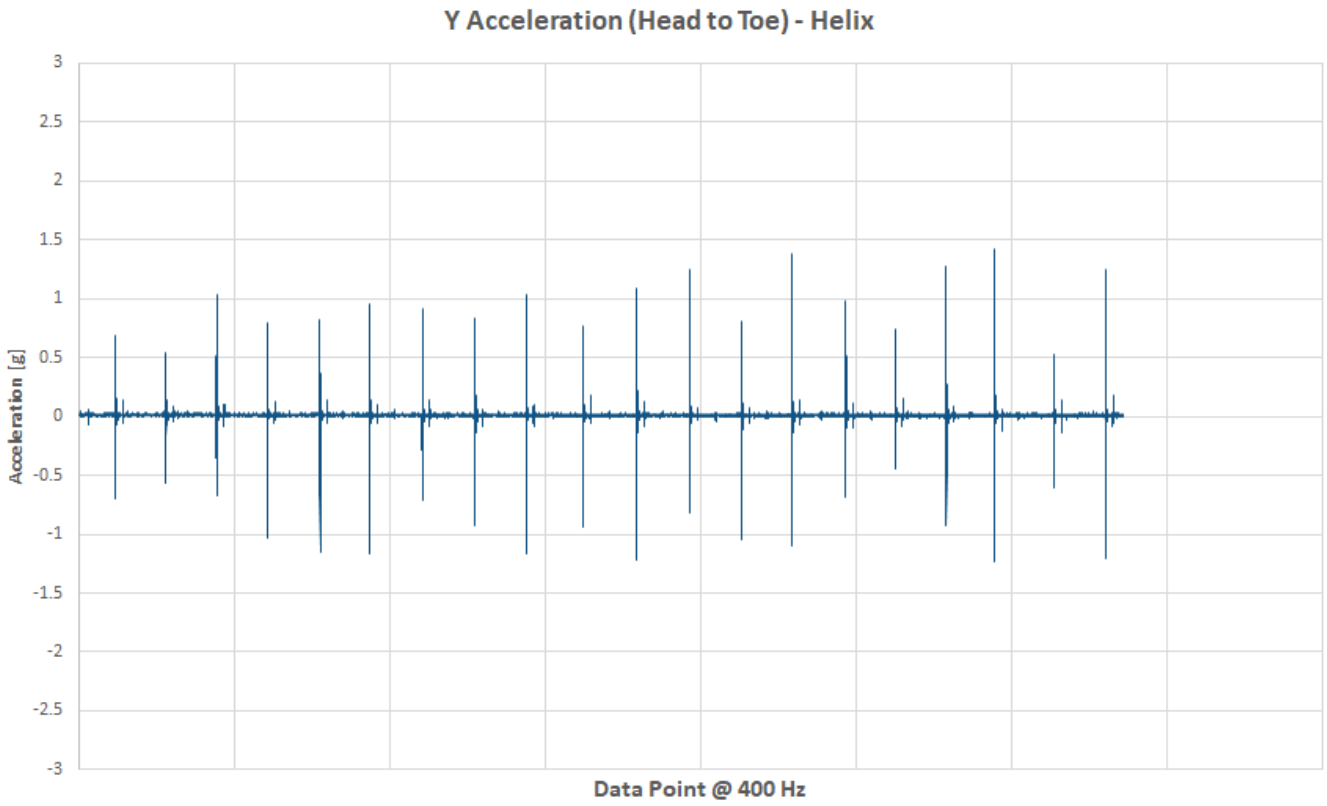

Y Acceleration (Head to Toe) - Endy (V2)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

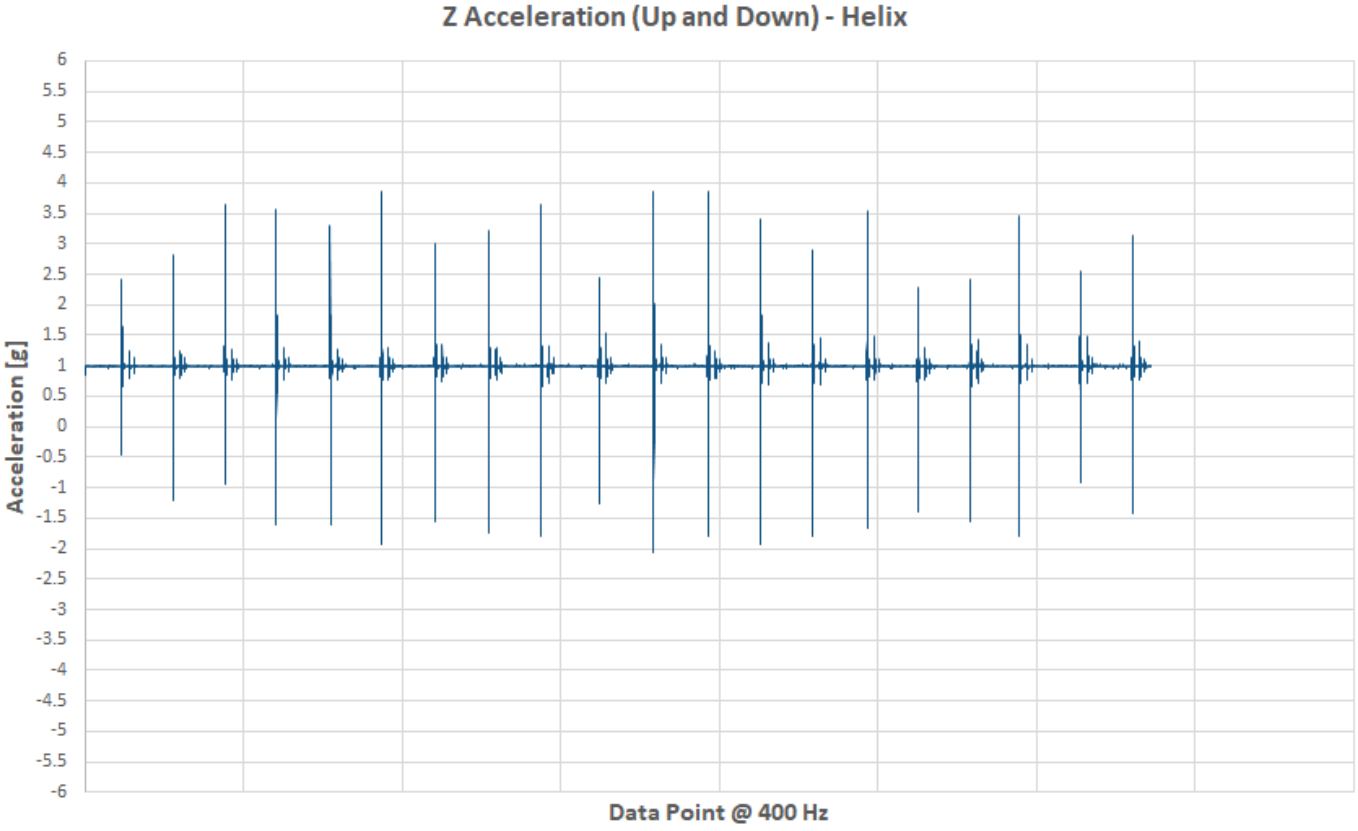

Z Acceleration (Up and Down) - Endy (V2)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – HELIX

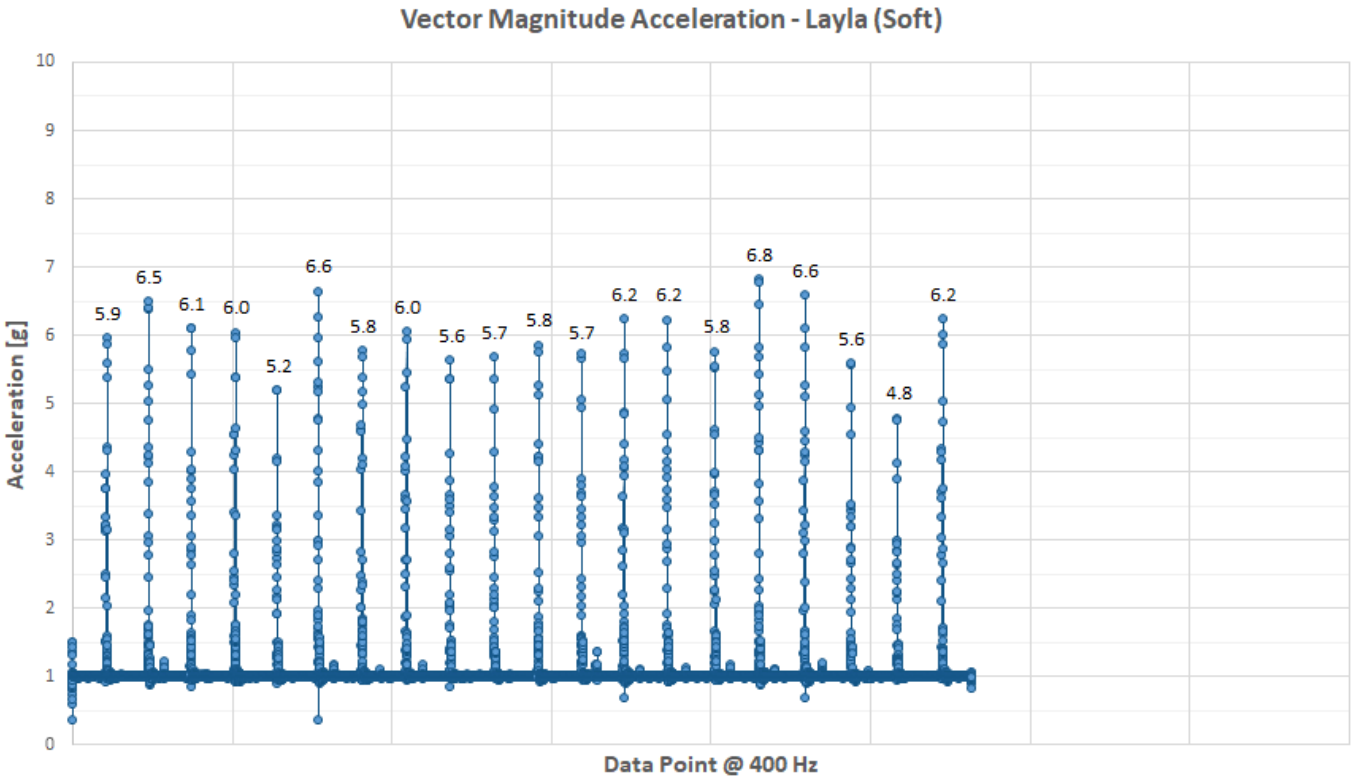

Vector Magnitude Acceleration - Helix
Acceleration [g]
Data Point @ 400 Hz
4.2
5.2
5.1
5.4
5.6
5.5
5.5
5.5
5.7
5.3
5.8
6.0
5.4
5.9
5.7
4.8
5.2
6.1
4.8
5.7

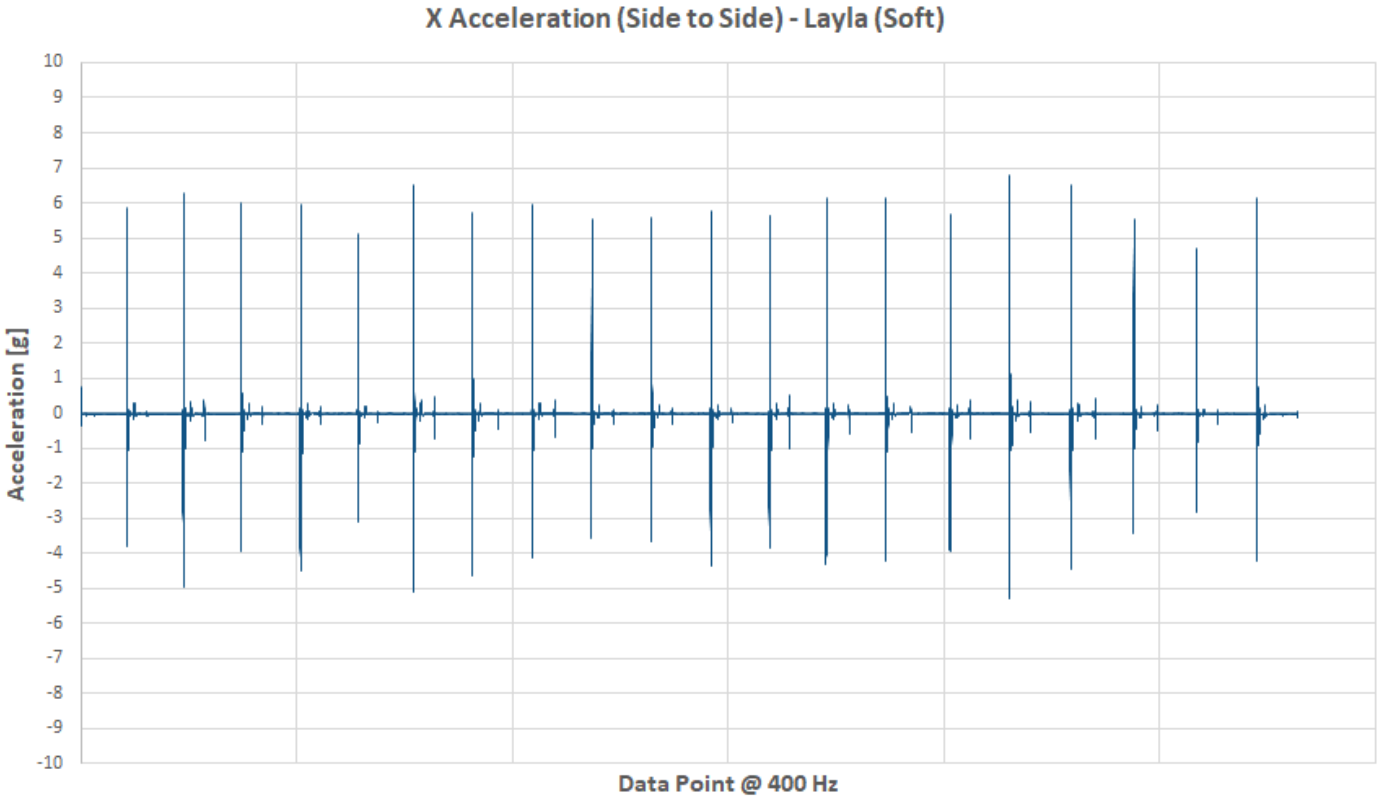

X Acceleration (Side to Side) - Helix
Acceleration [g]
Data Point @ 400 Hz

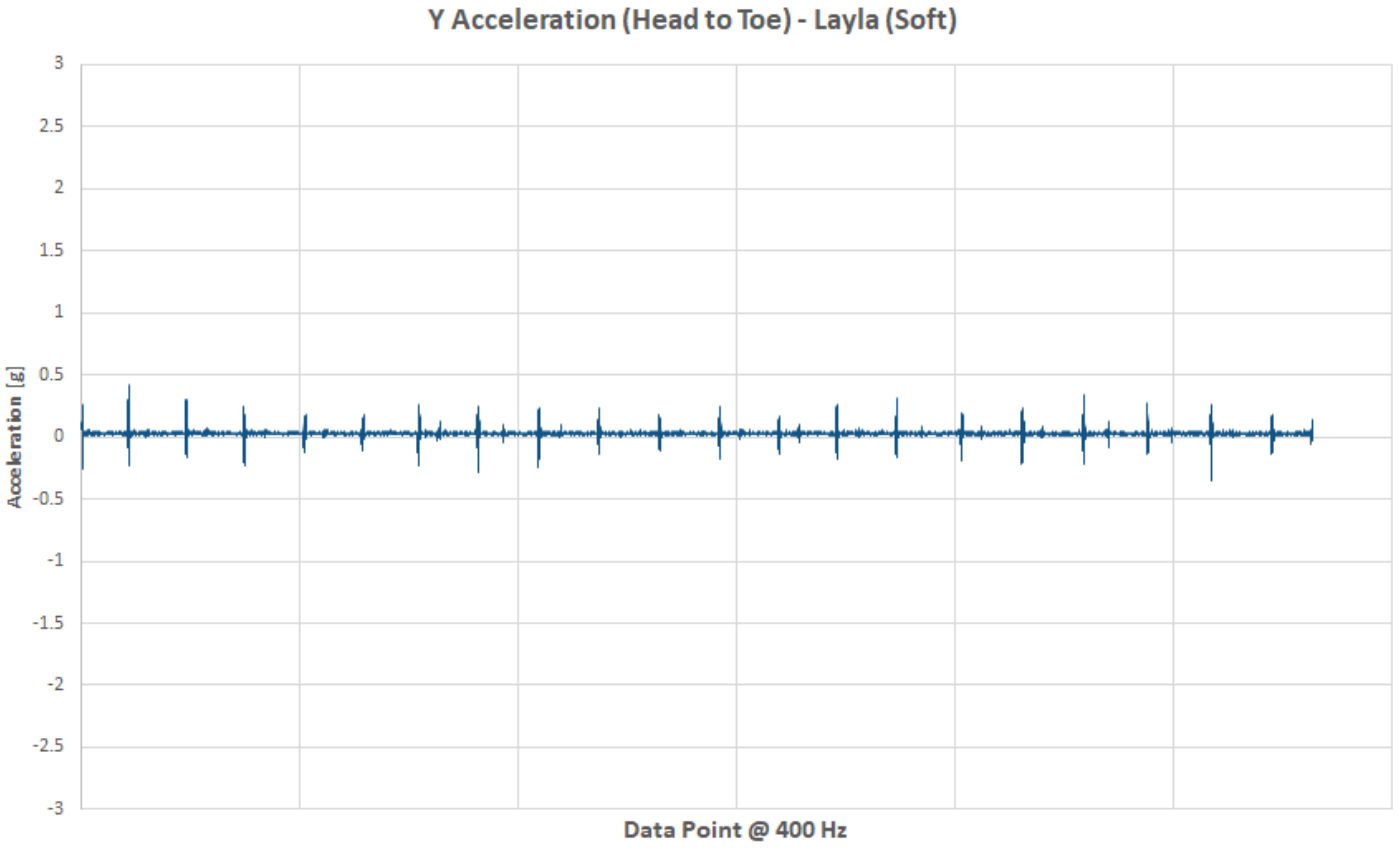

Y Acceleration (Head to Toe) - Helix
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

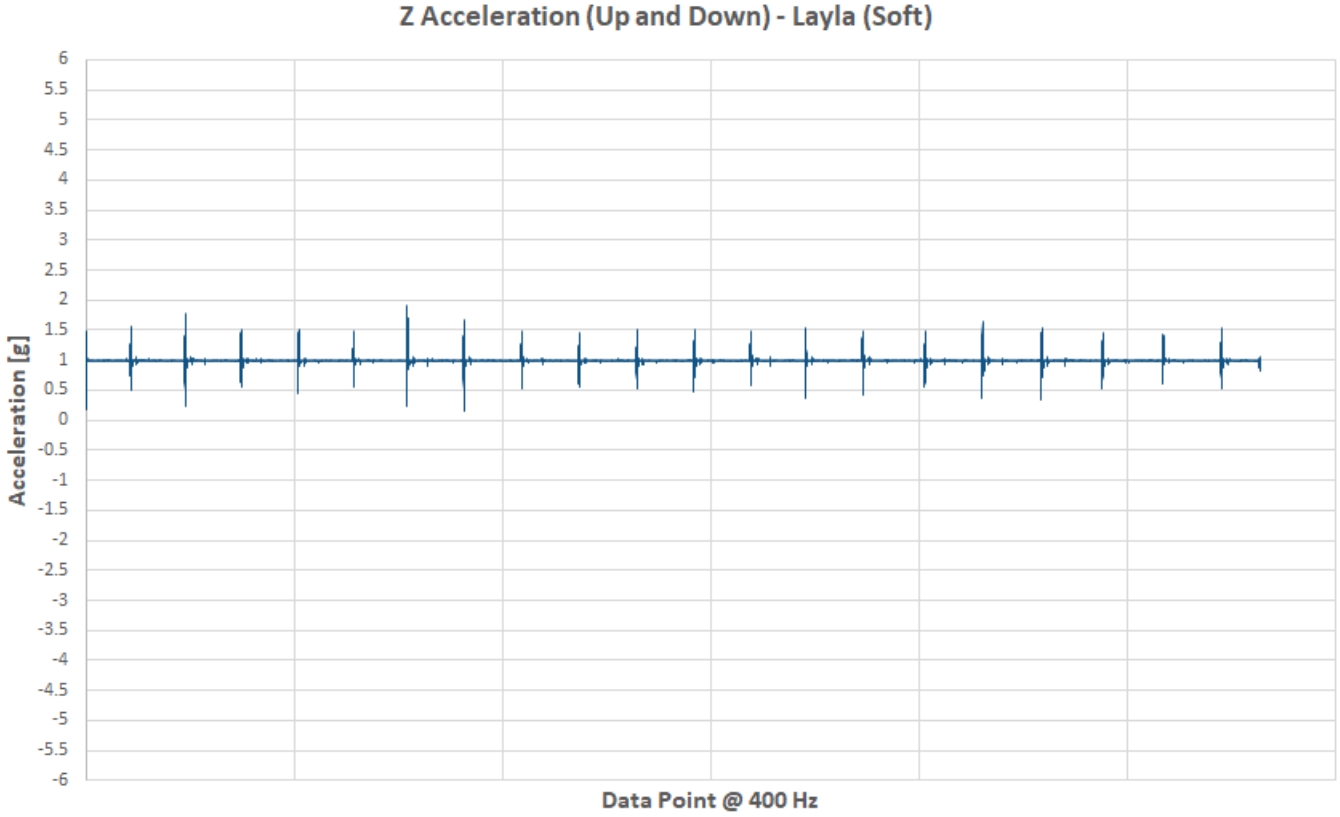

Z Acceleration (Up and Down) - Helix
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – LAYLA (SOFT)

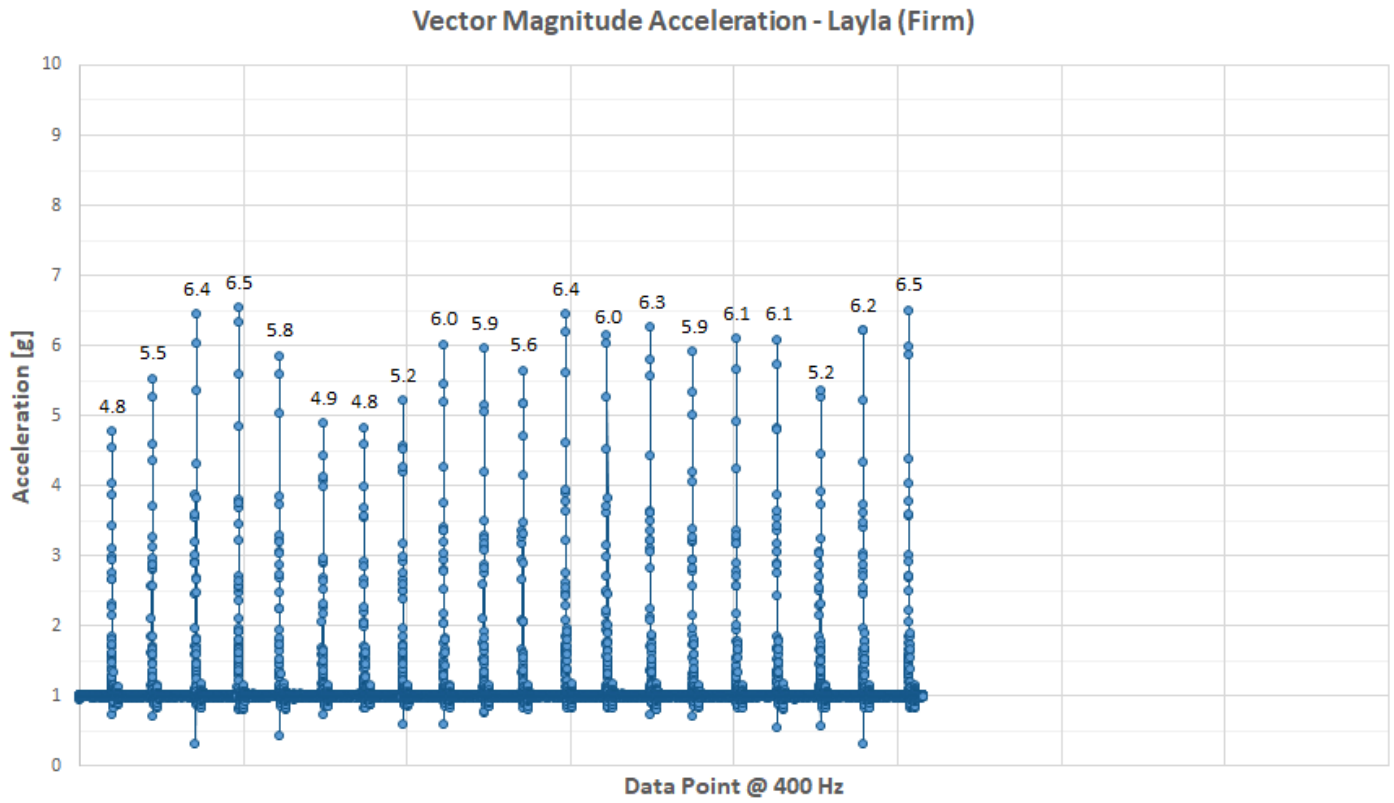


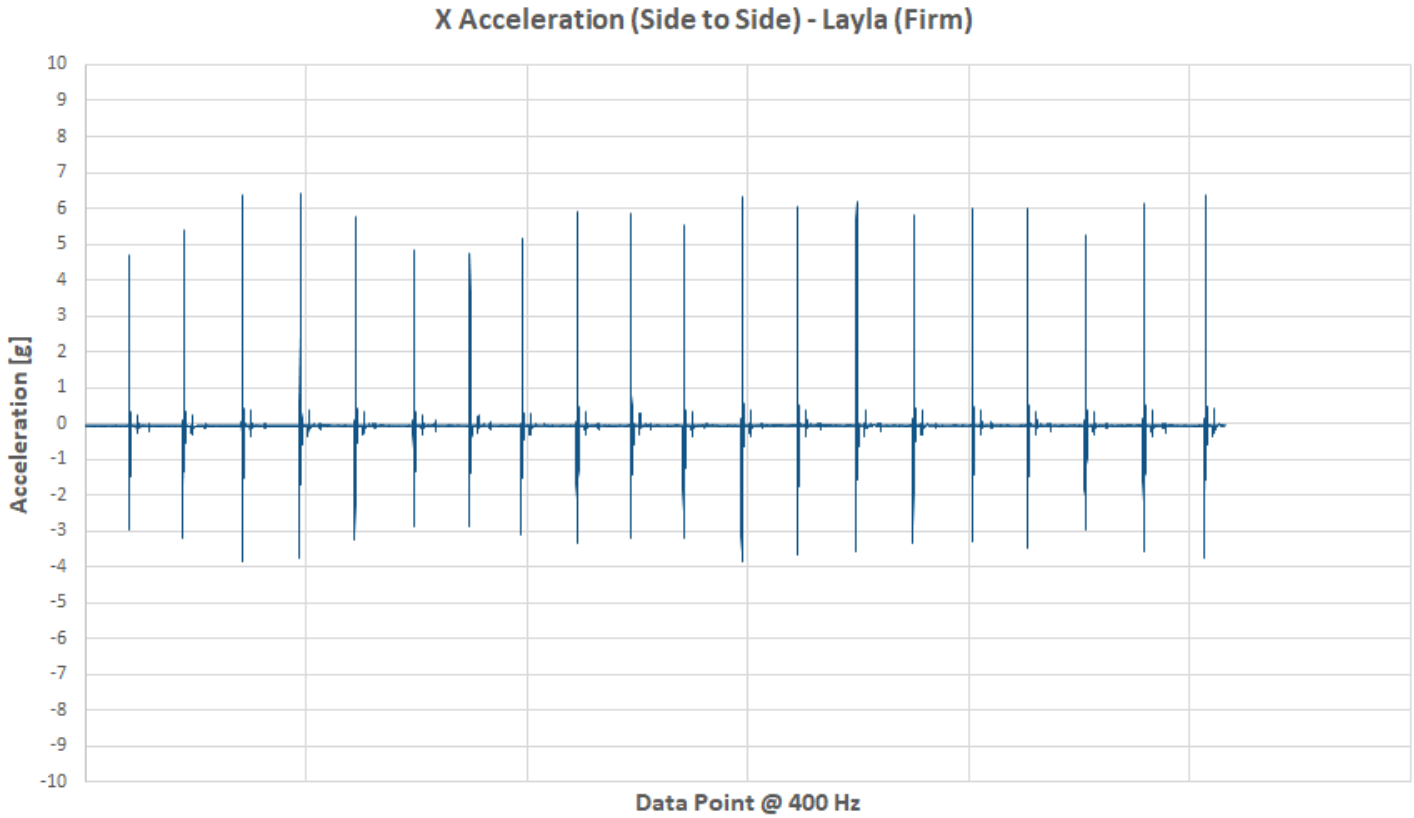


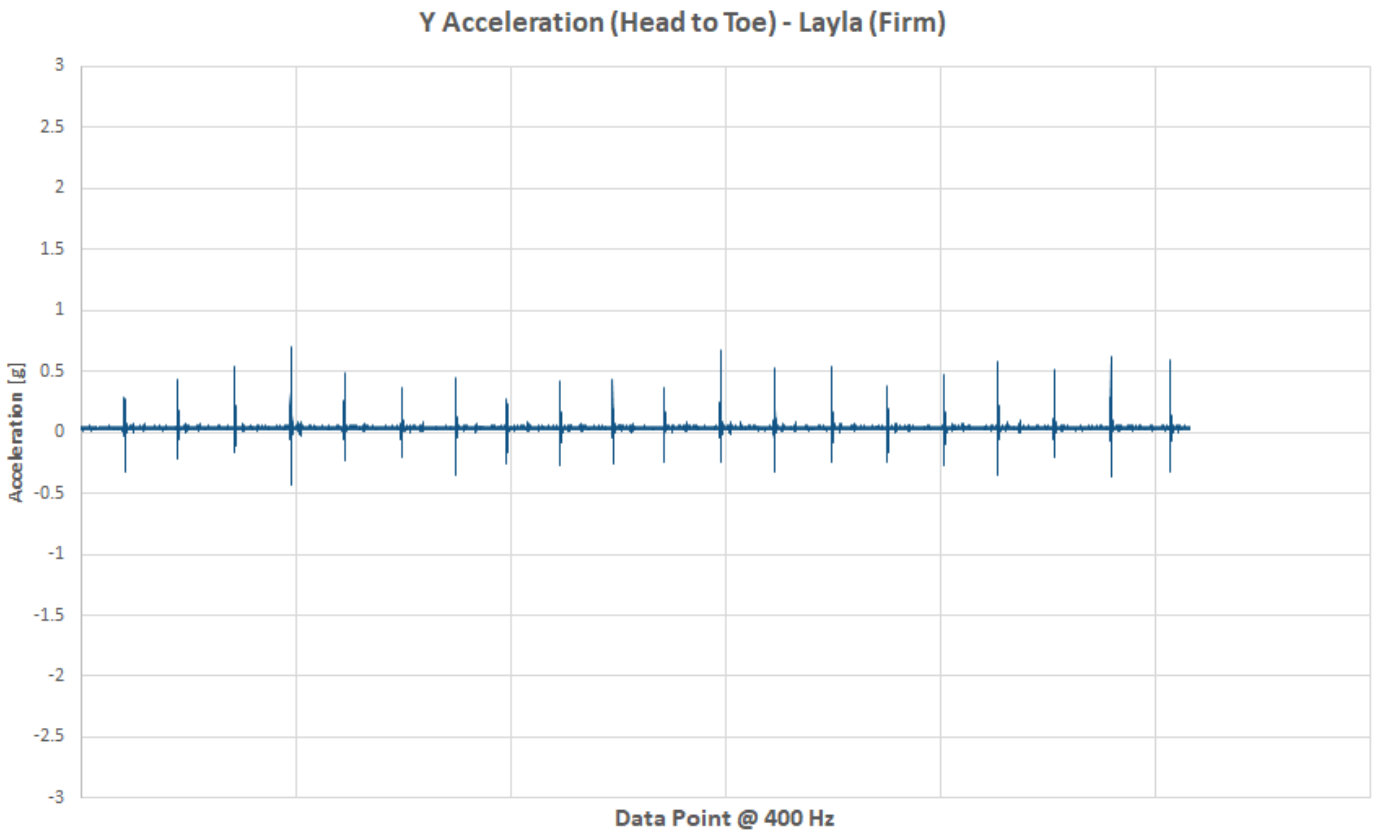

Y Acceleration (Head to Toe) - Layla (Soft)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

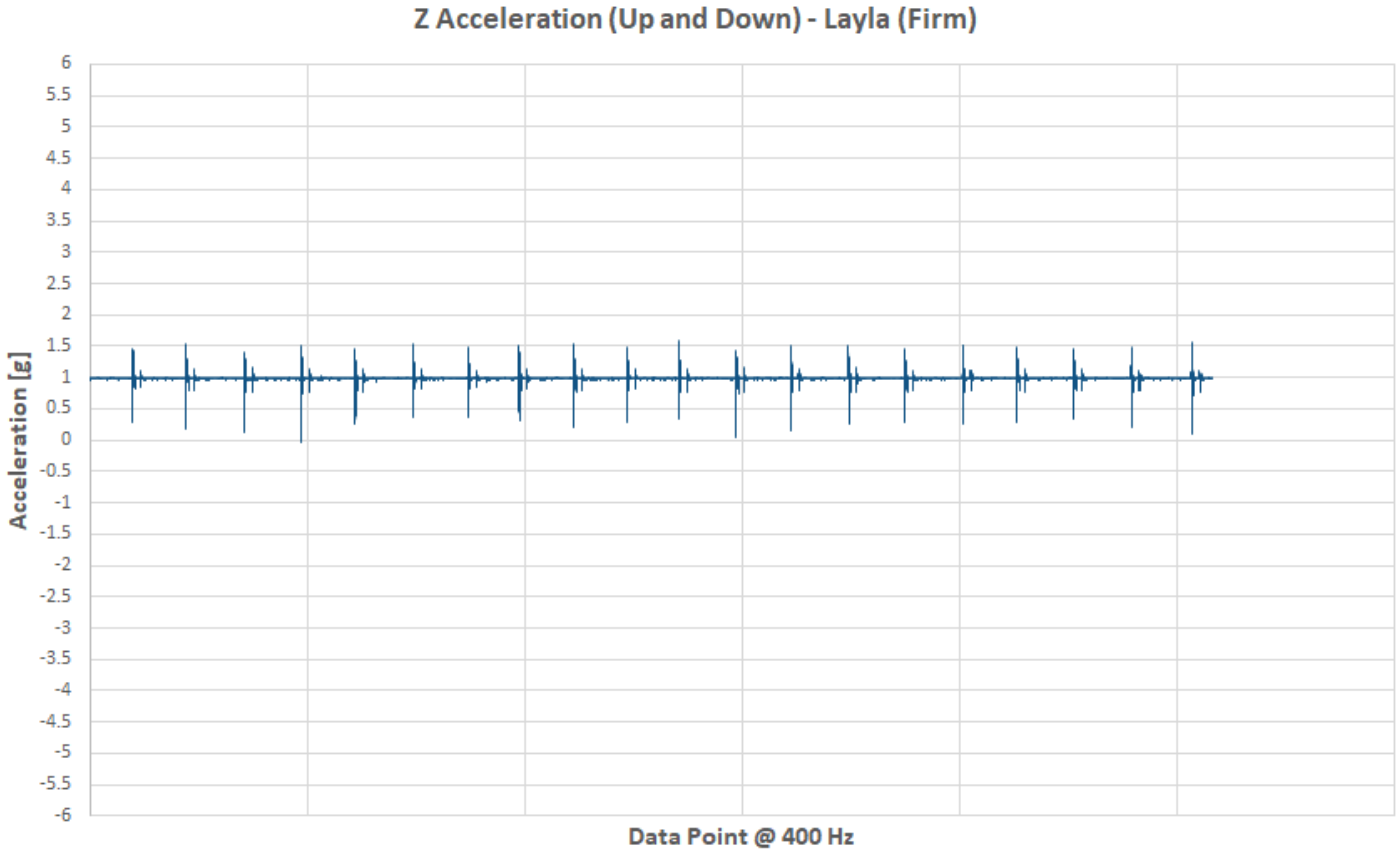

Z Acceleration (Up and Down) - Layla (Soft)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – LAYLA (FIRM)

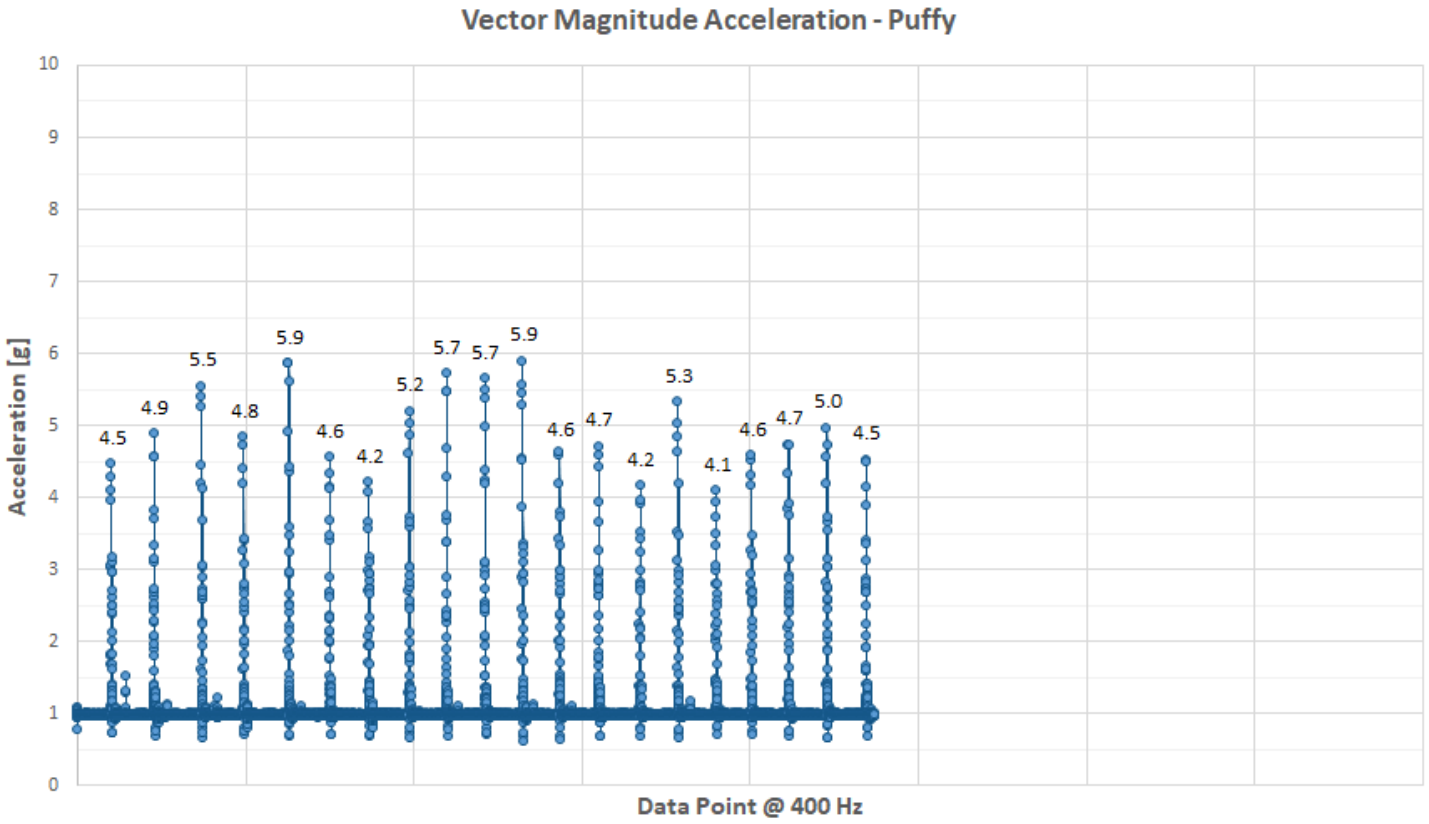


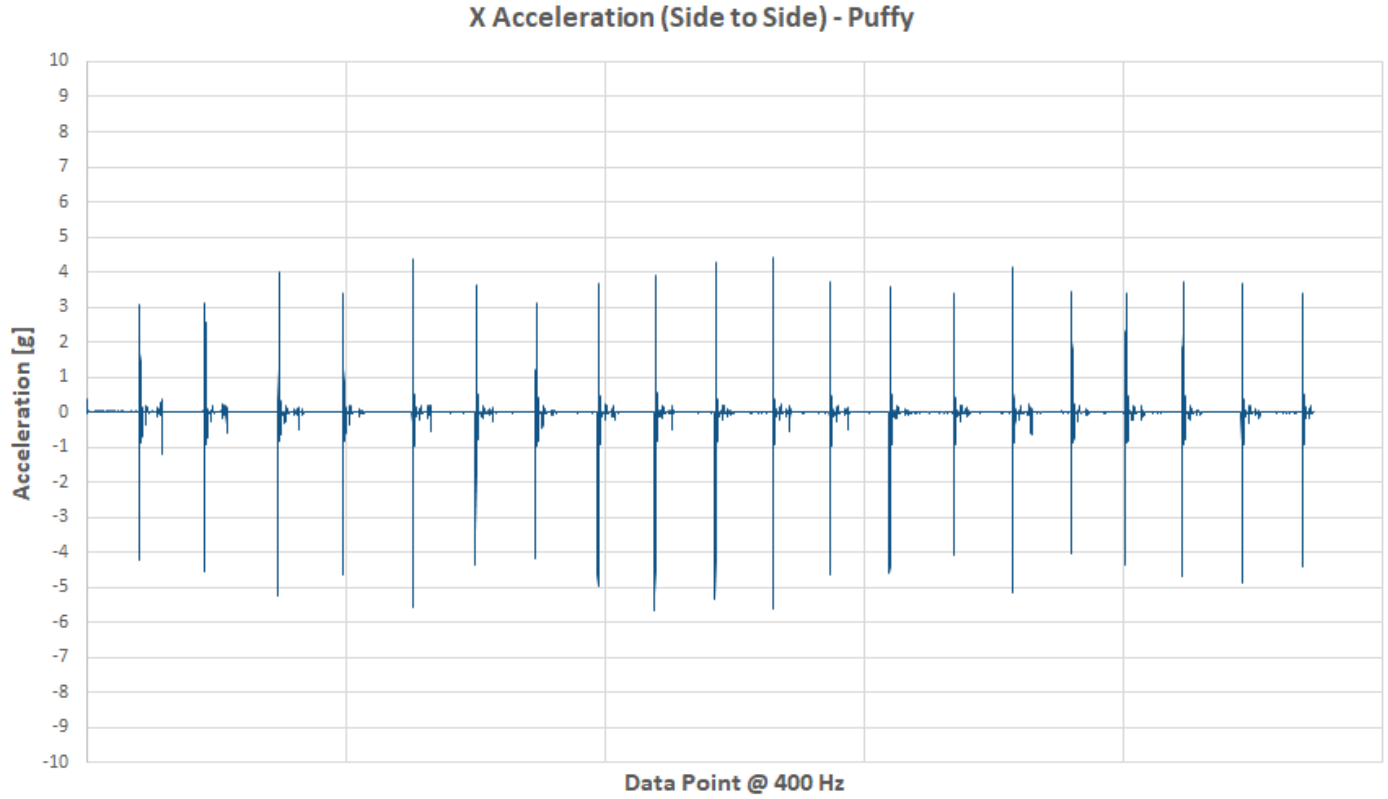


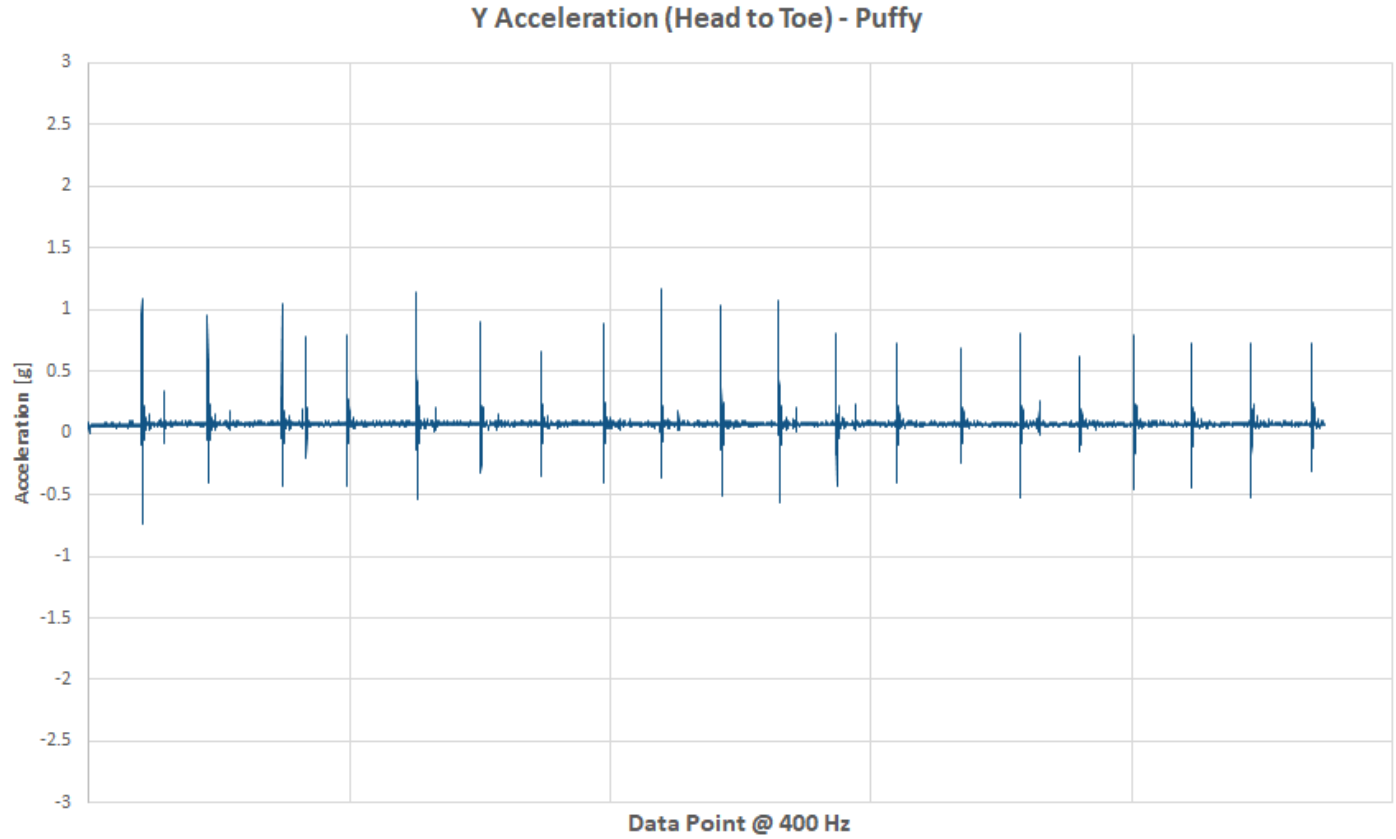

Y Acceleration (Head to Toe) - Layla (Firm)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

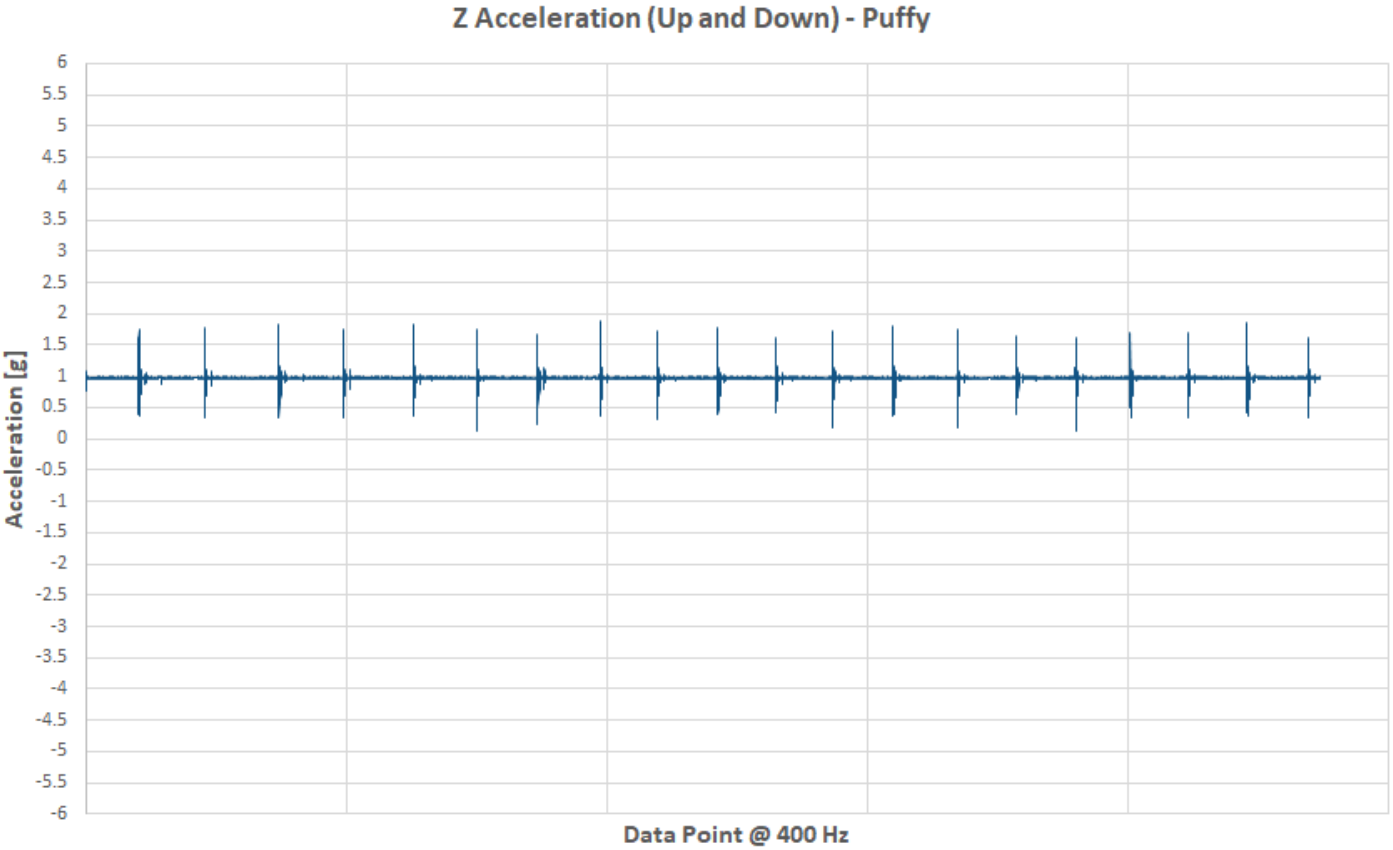

Z Acceleration (Up and Down) - Layla (Firm)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – PUFFY

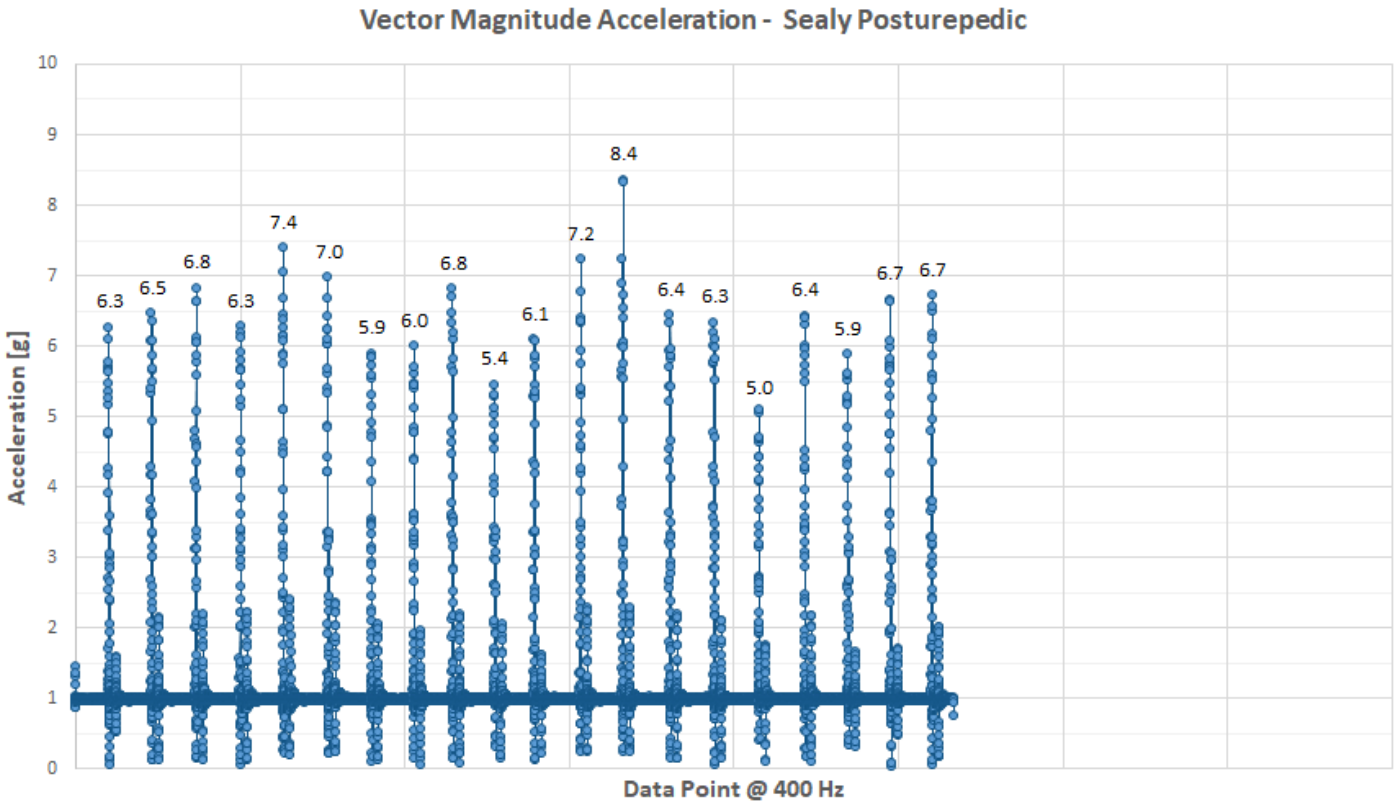

Vector Magnitude Acceleration - Puffy
Acceleration [g]
Data Point @ 400 Hz
4.5
4.9
5.5
4.8
5.9
4.6
4.2
5.2
5.7
5.7
5.9
4.6
4.7
4.2
5.3
4.1
4.6
4.7
5.0
4.5

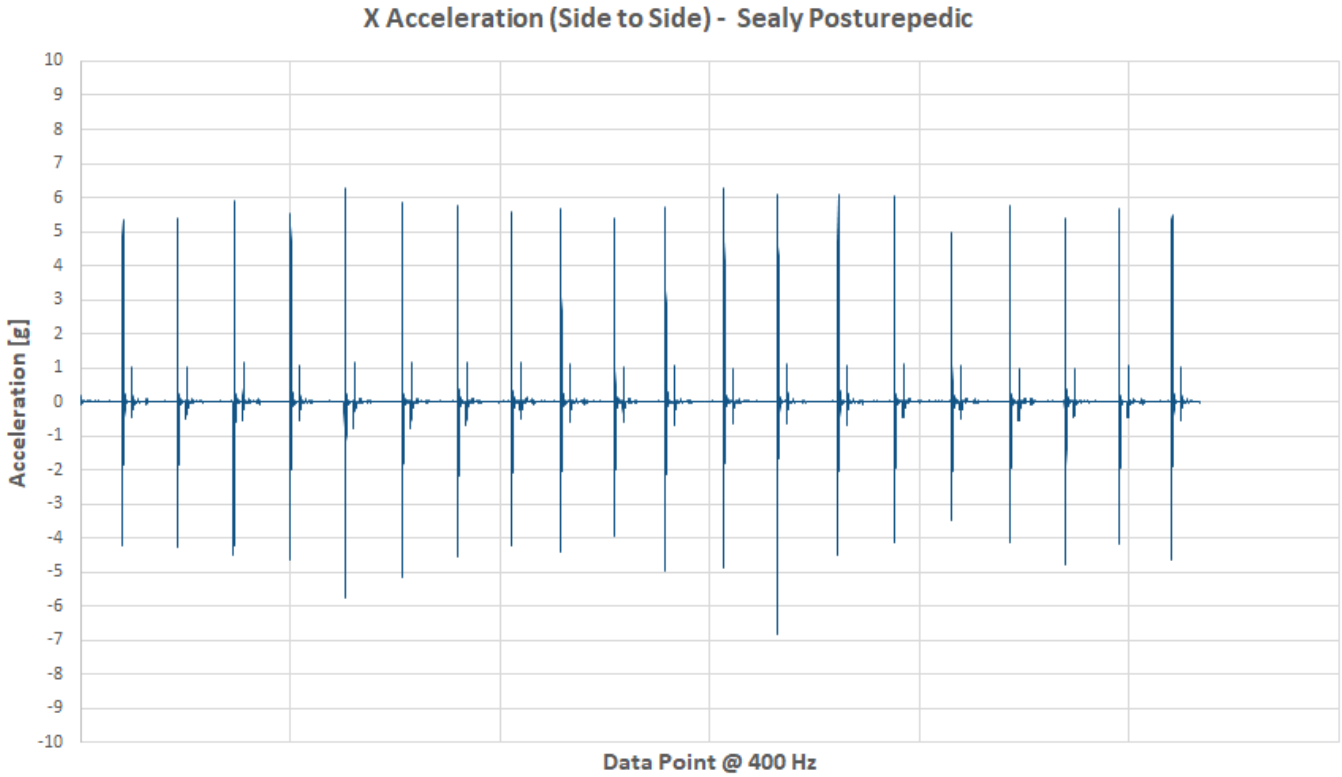

X Acceleration (Side to Side) - Puffy
Acceleration [g]
Data Point @ 400 Hz

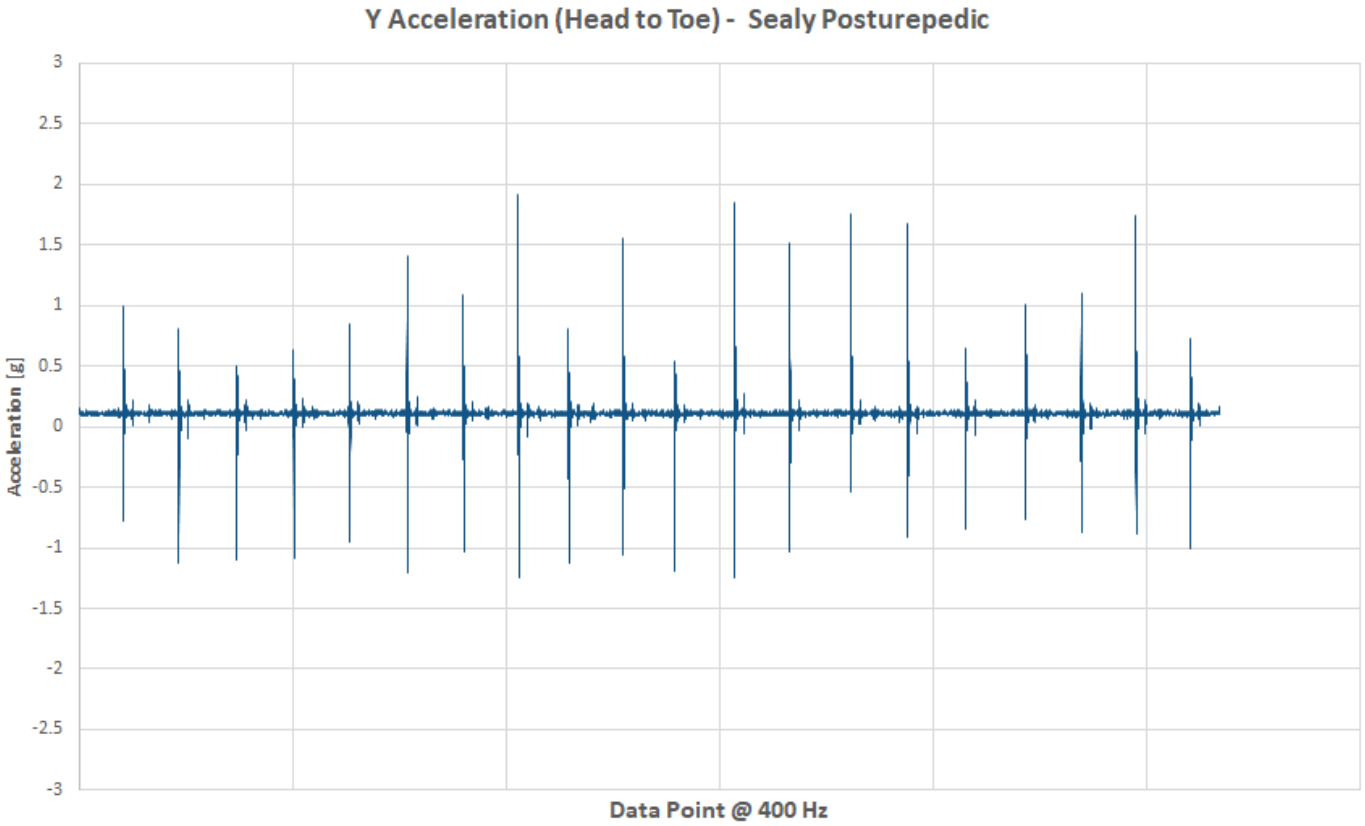

Y Acceleration (Head to Toe) - Puffy
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

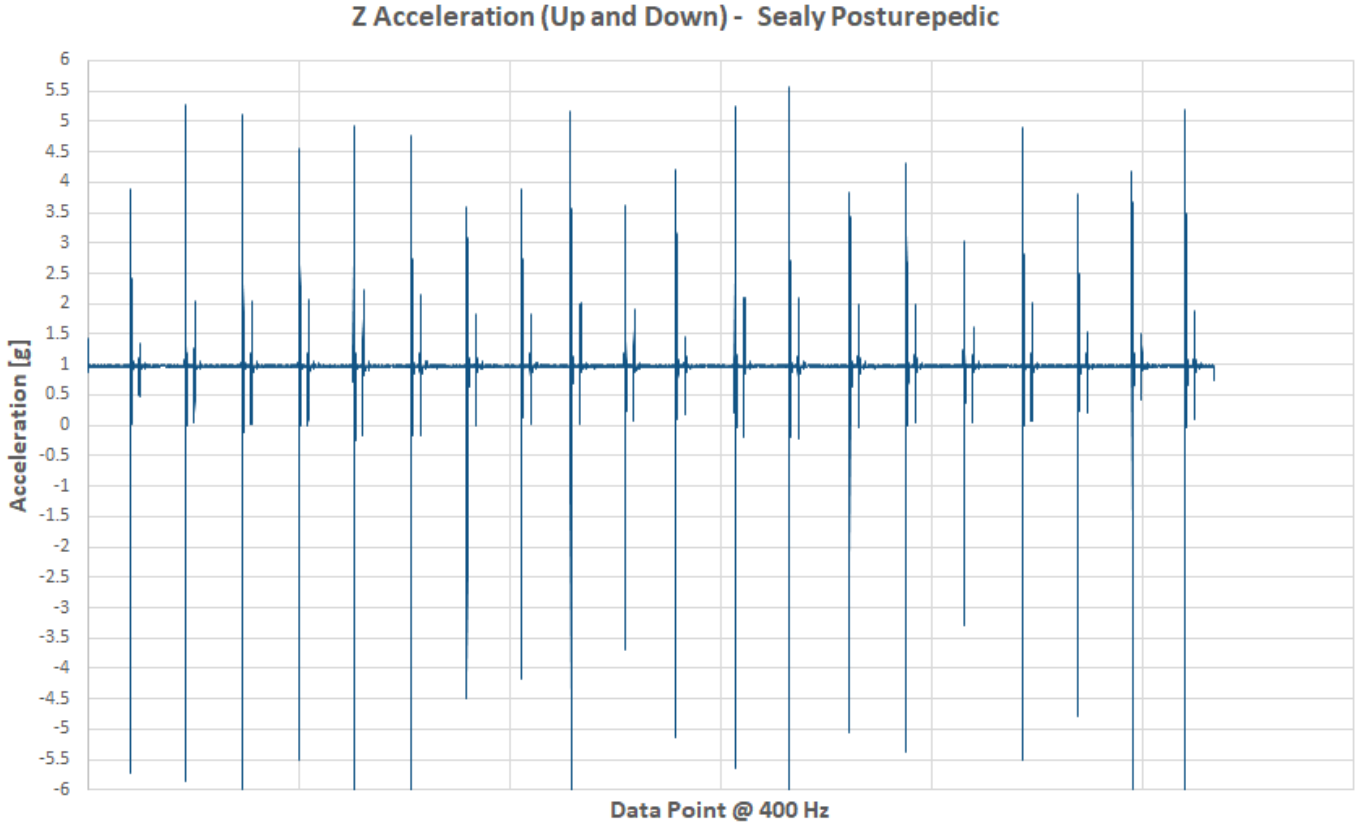

Z Acceleration (Up and Down) - Puffy
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – SEALY POSTUREPEDIC

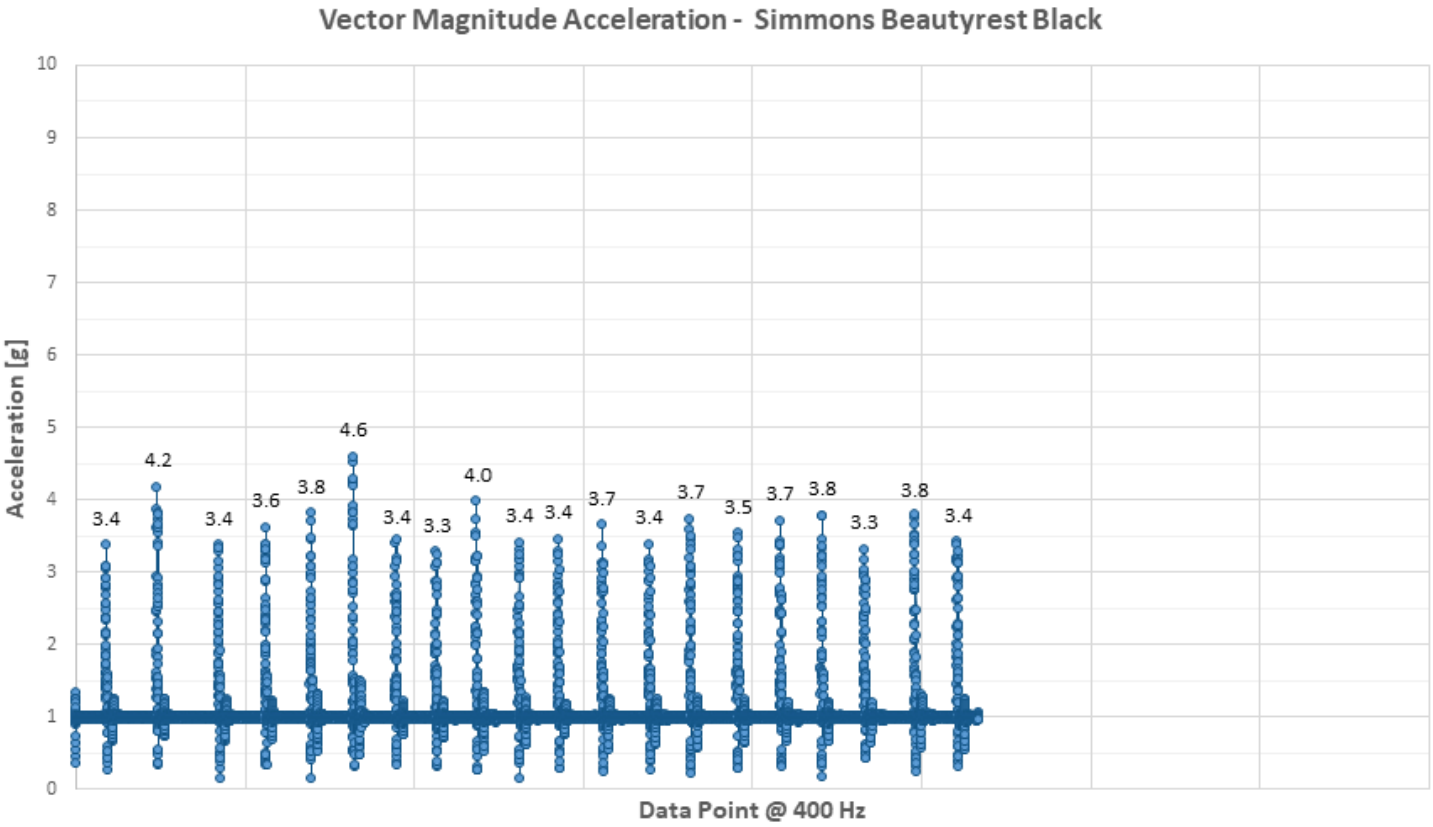


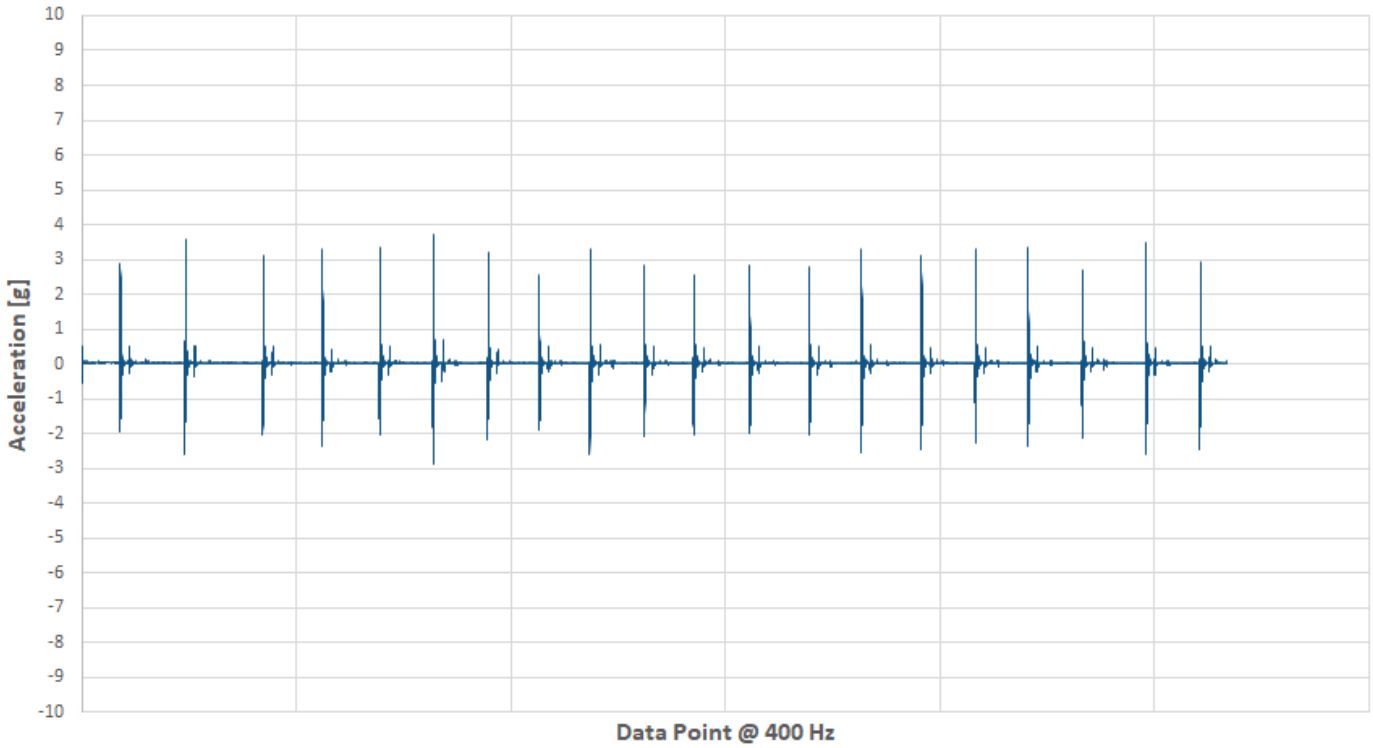


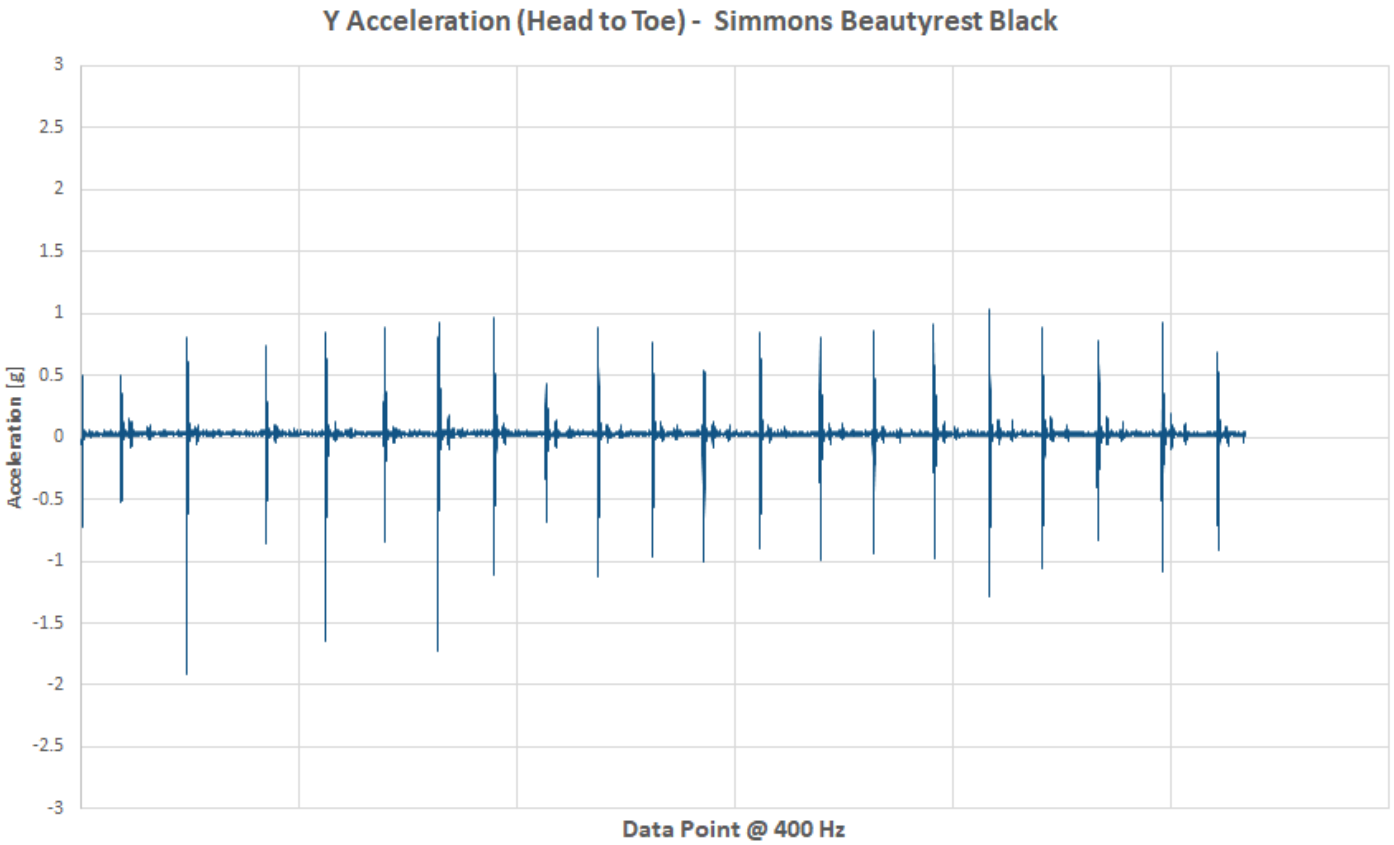

Y Acceleration (Head to Toe) - Sealy Posturepedic
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

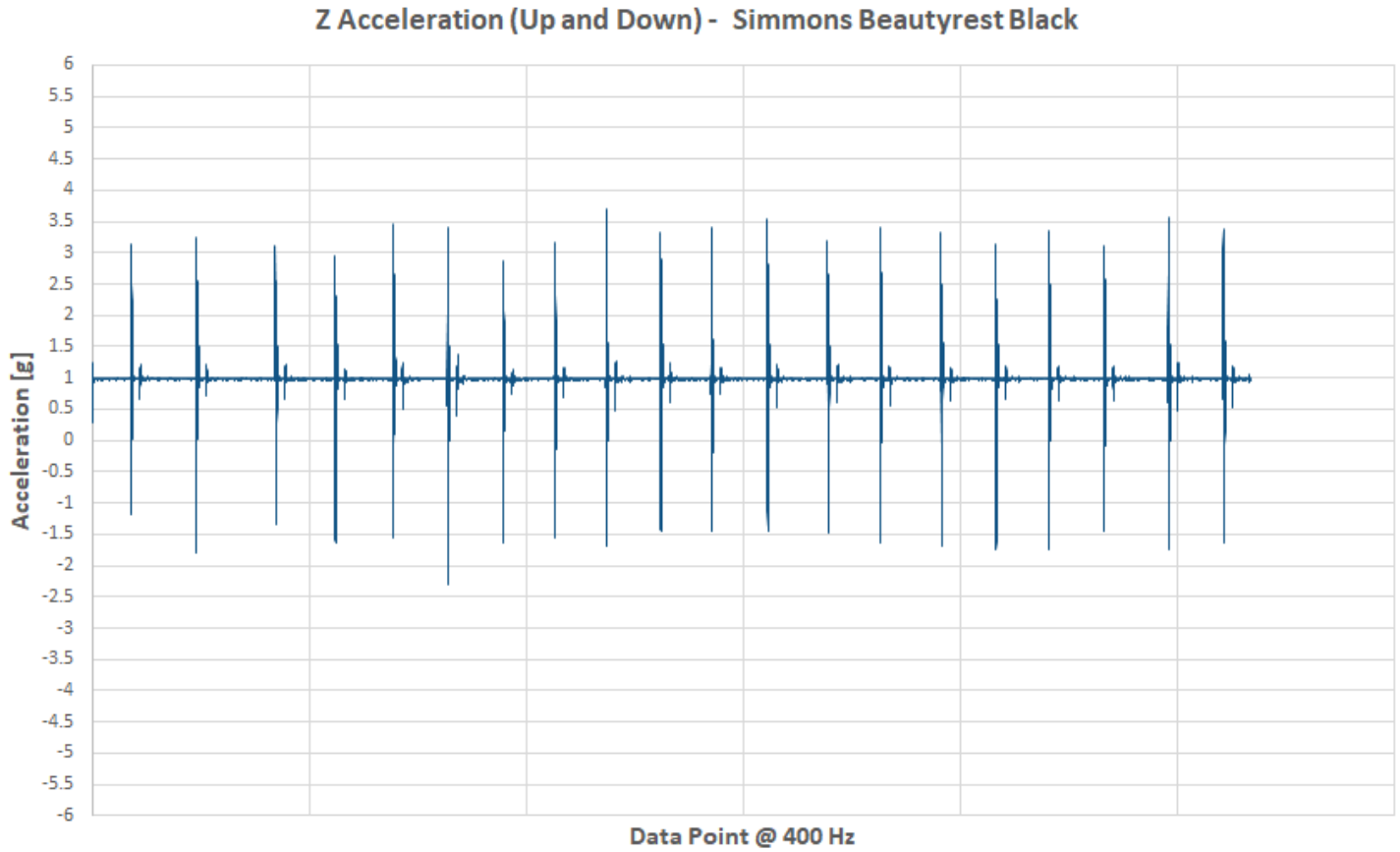

Z Acceleration (Up and Down) - Sealy Posturepedic
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – SIMMONS BEAUTYREST BLACK

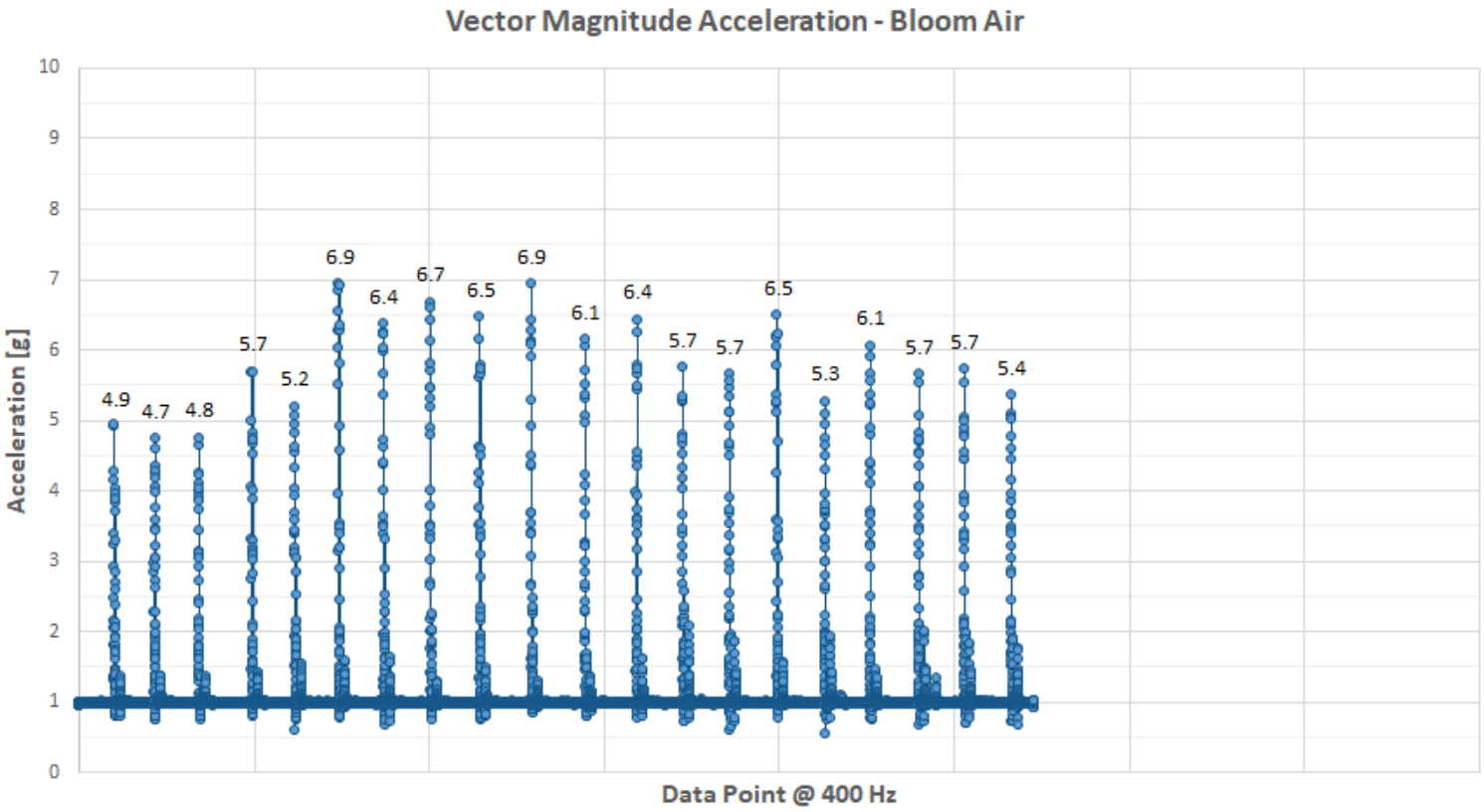


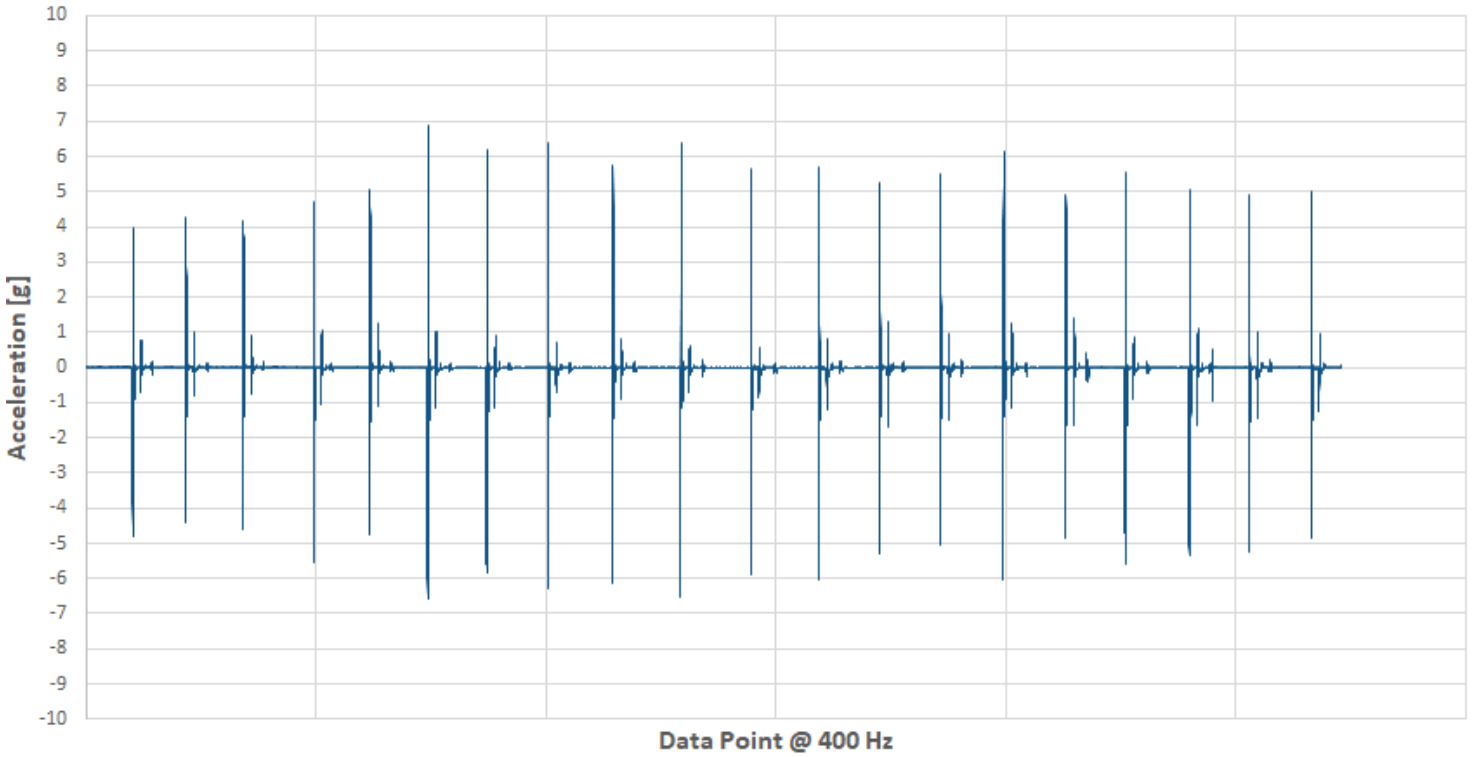


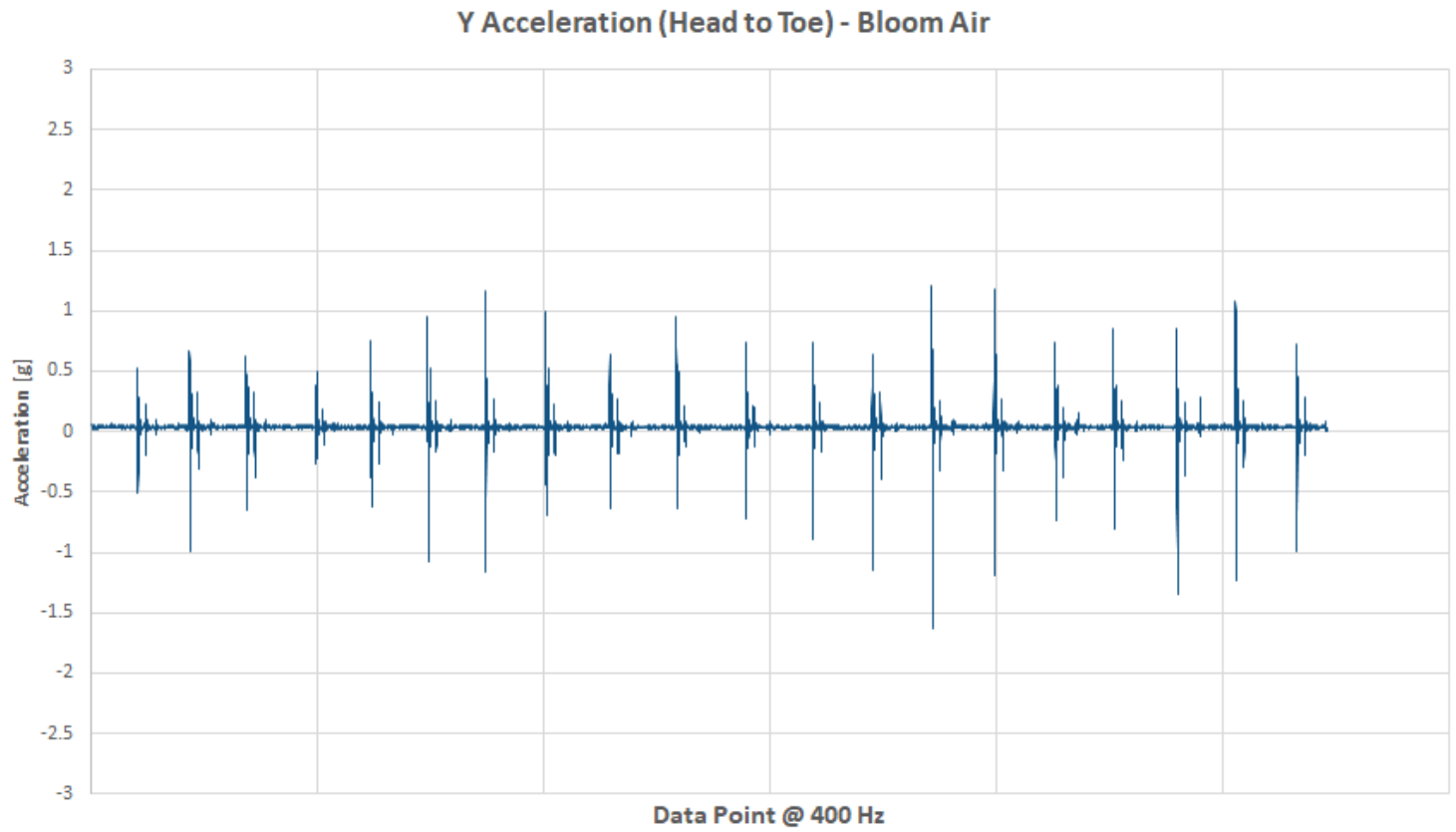

Y Acceleration (Head to Toe) - Simmons Beautyrest Black
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

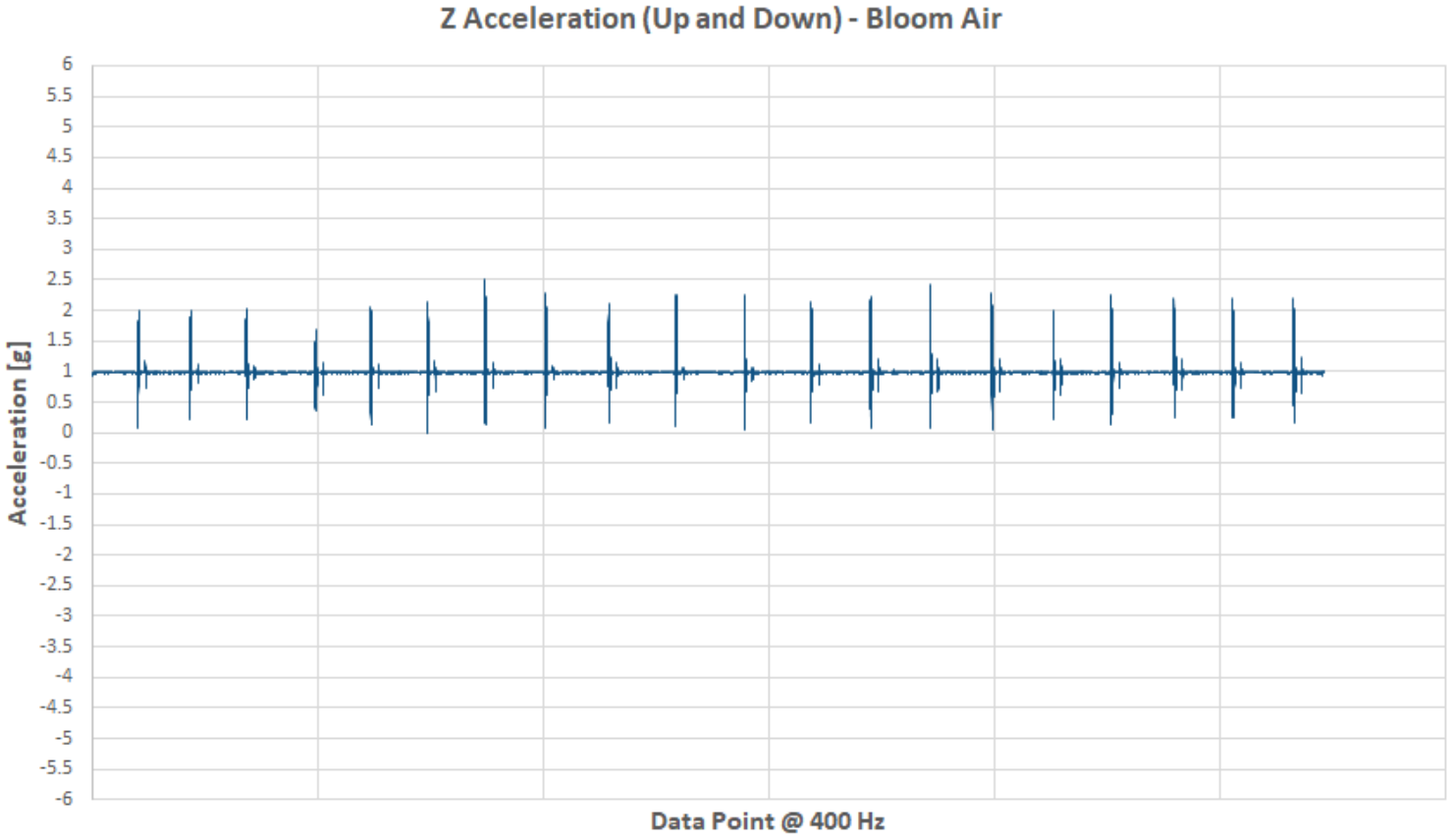

Z Acceleration (Up and Down) - Simmons Beautyrest Black
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – BLOOM AIR

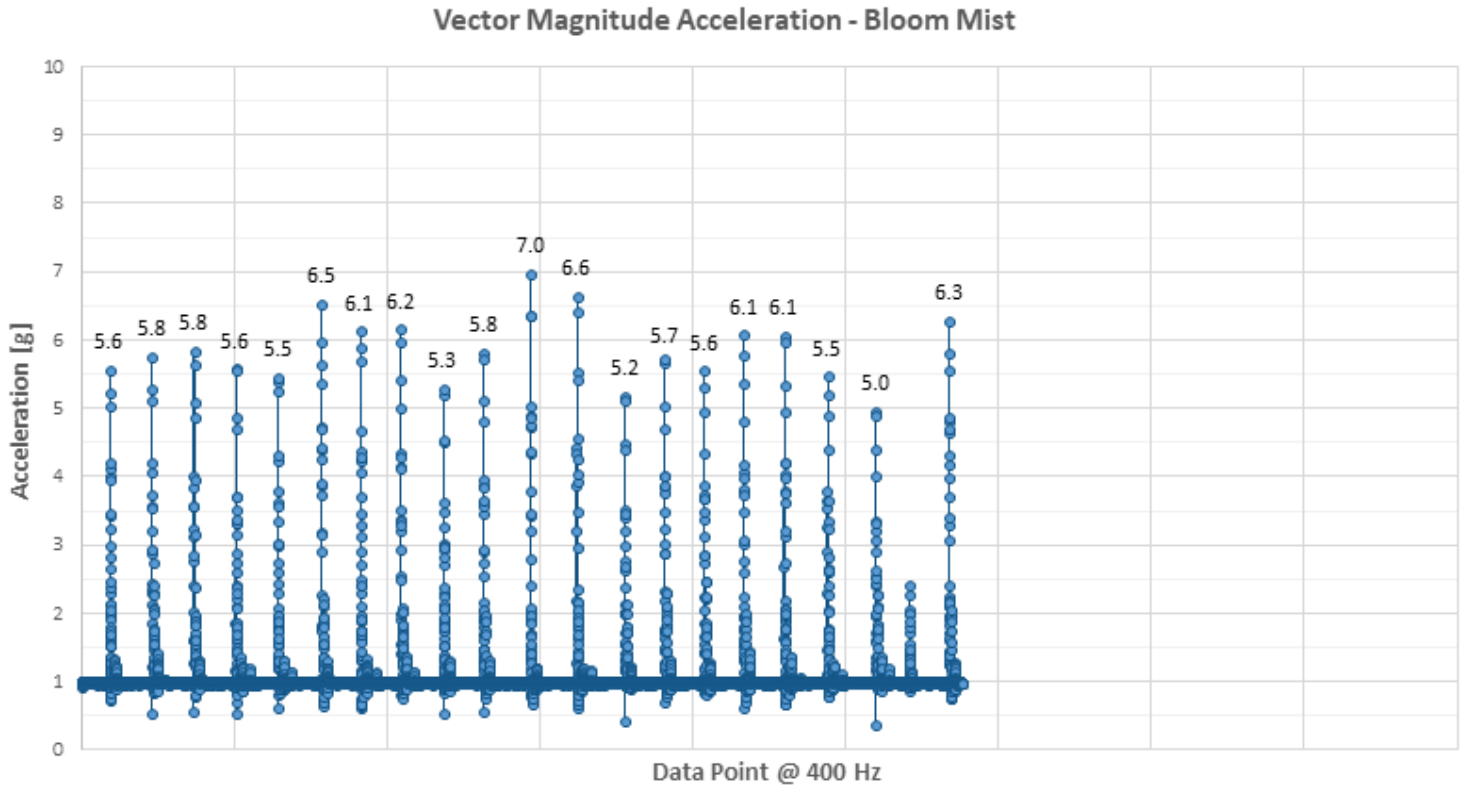


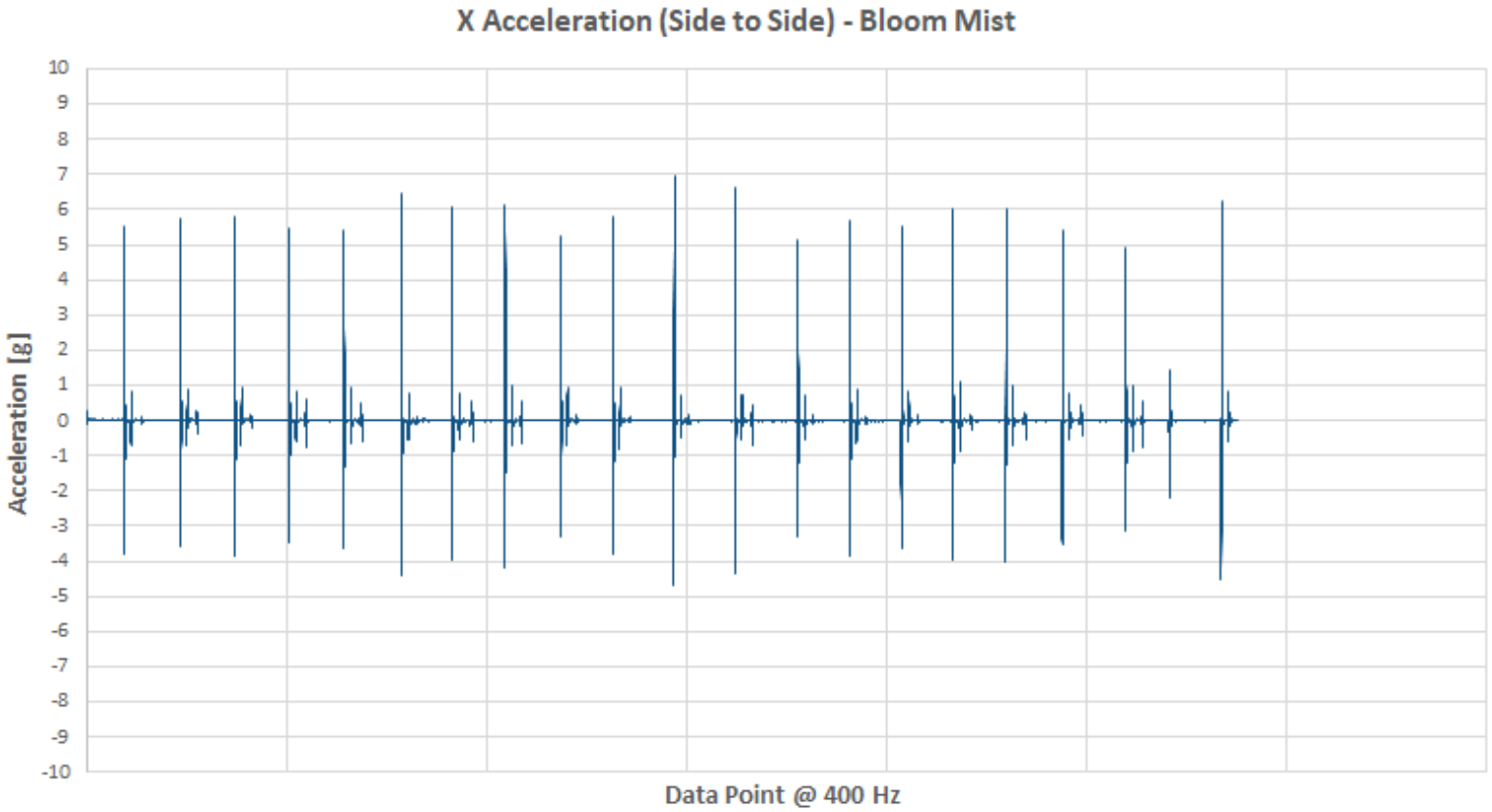


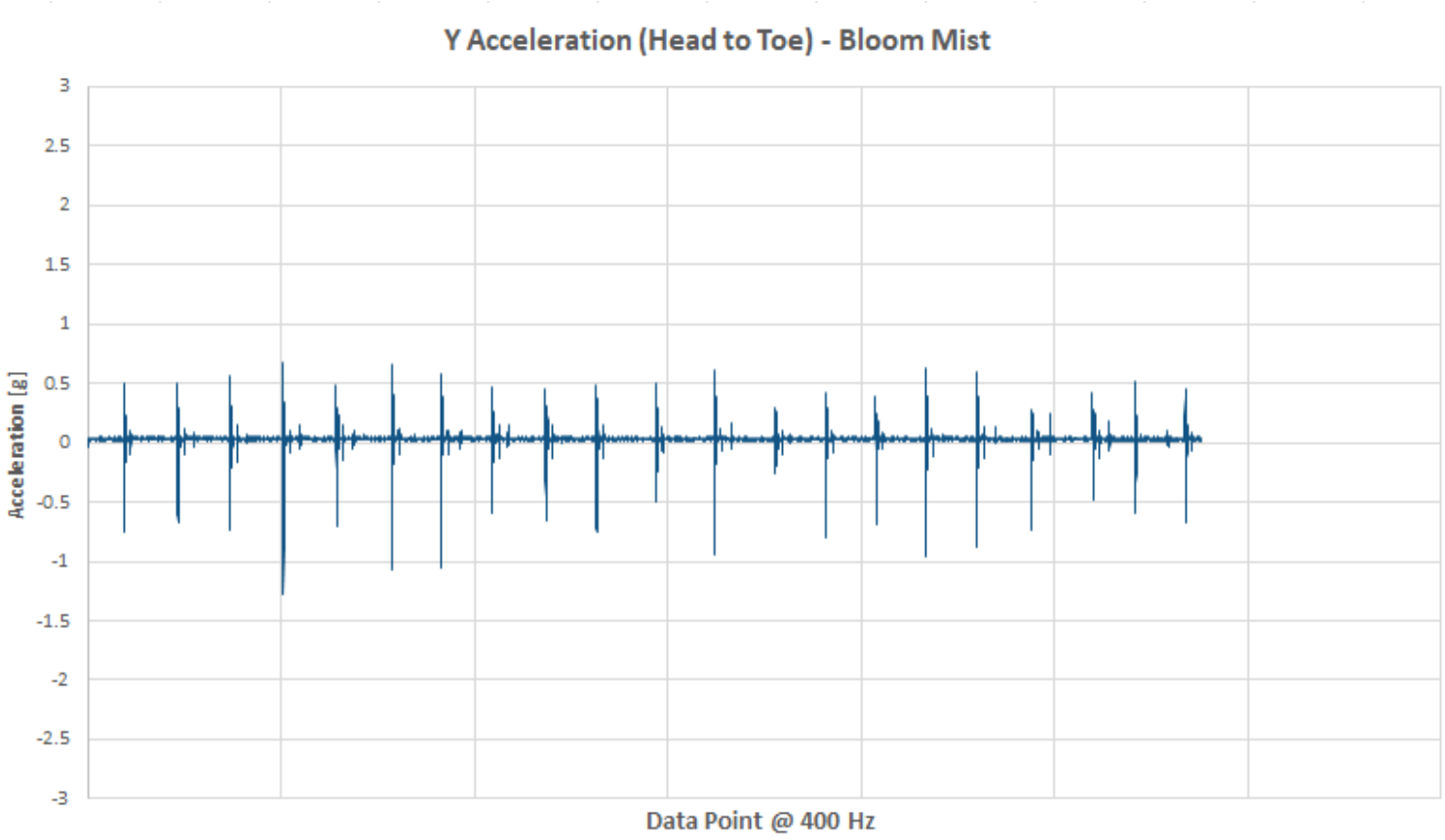

Y Acceleration (Head to Toe) - Bloom Air
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

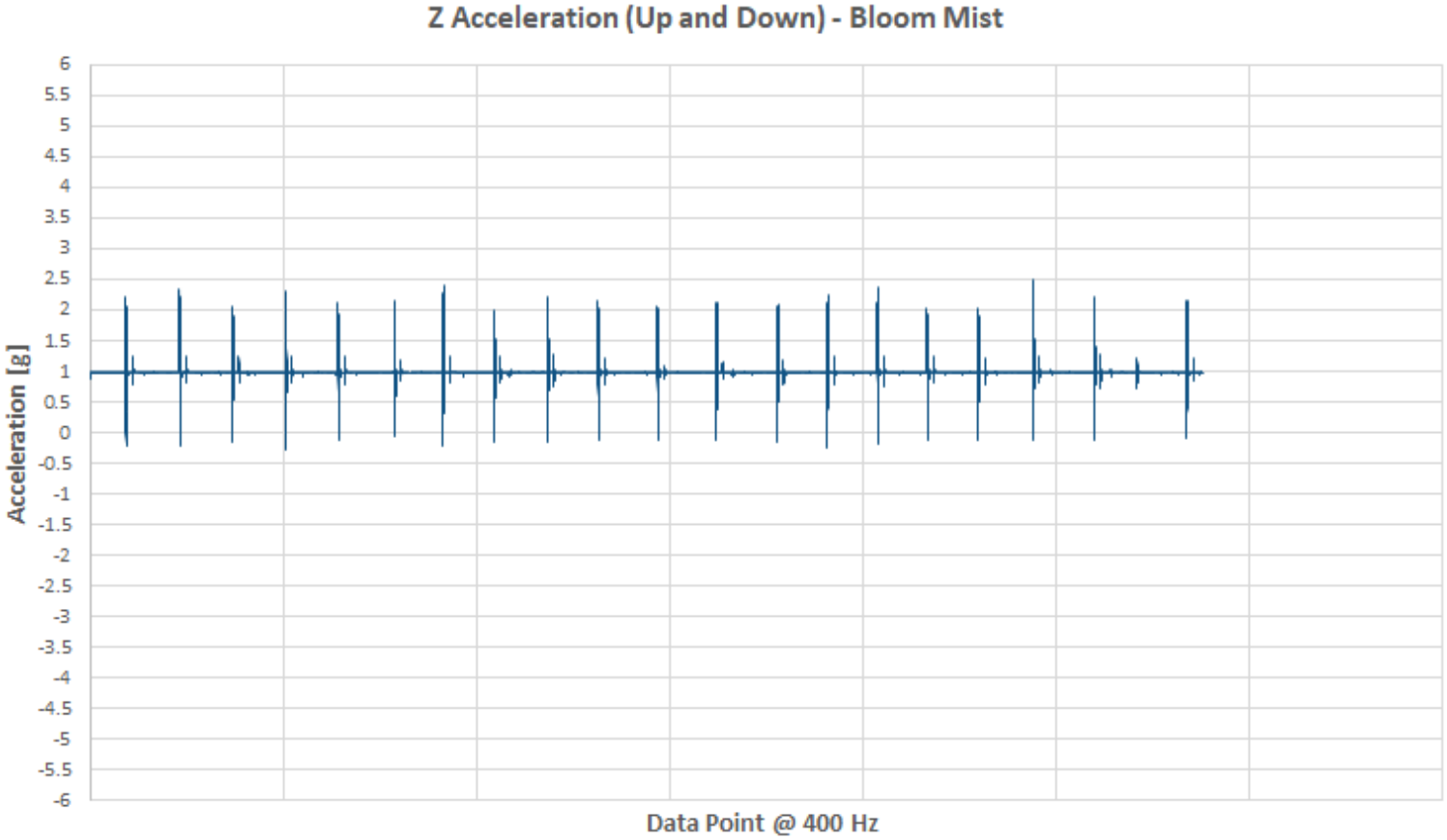

Z Acceleration (Up and Down) - Bloom Air
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – BLOOM MIST

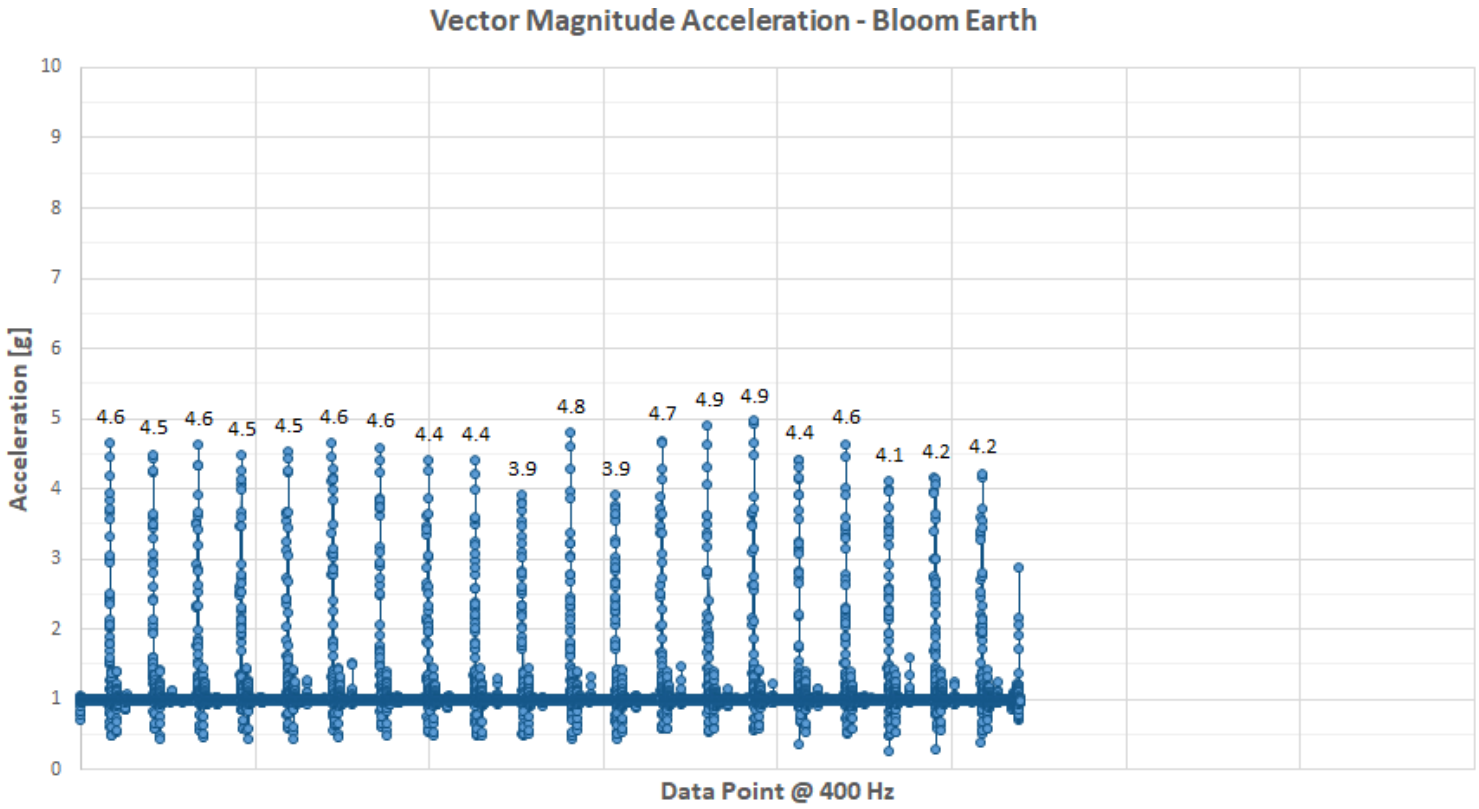


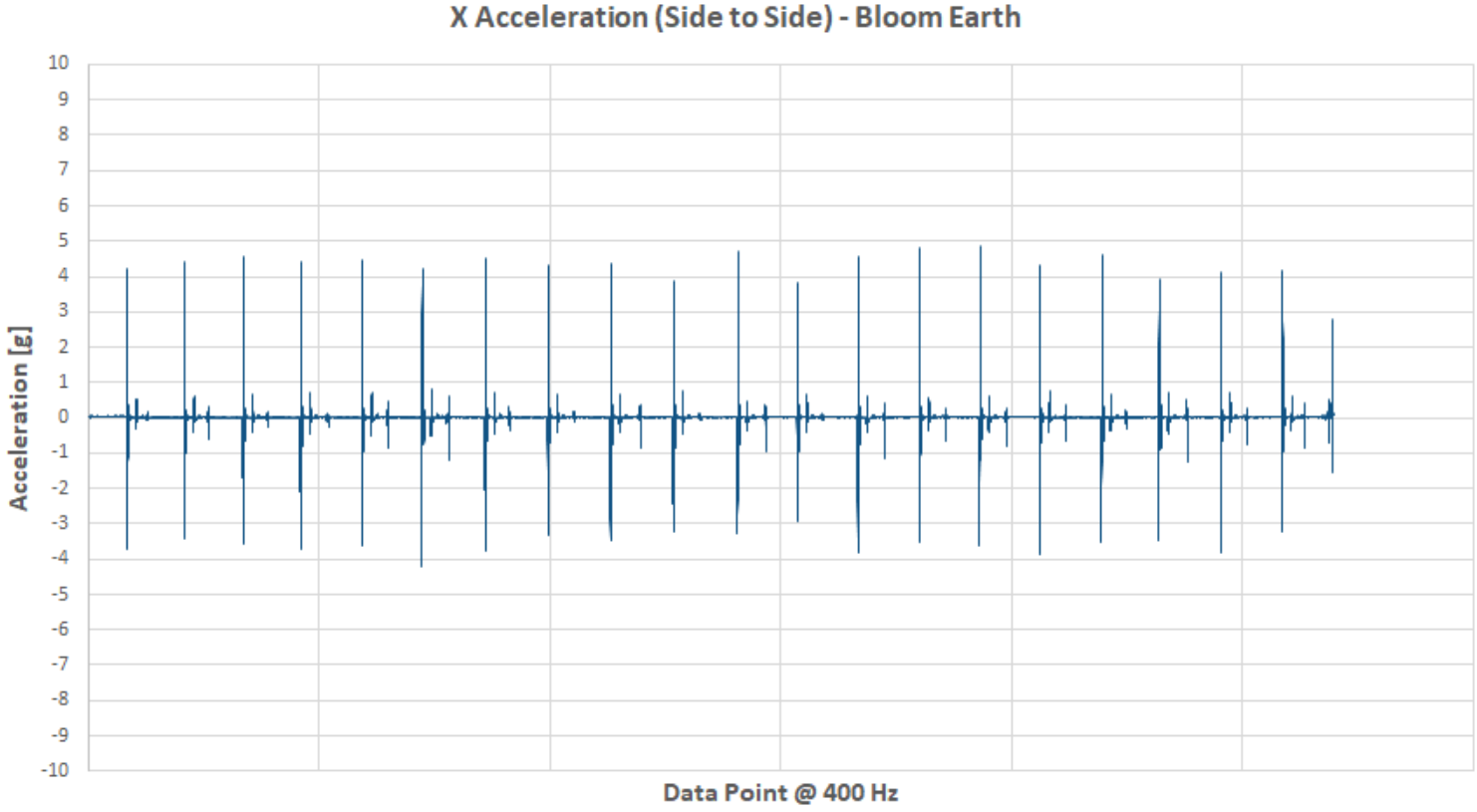


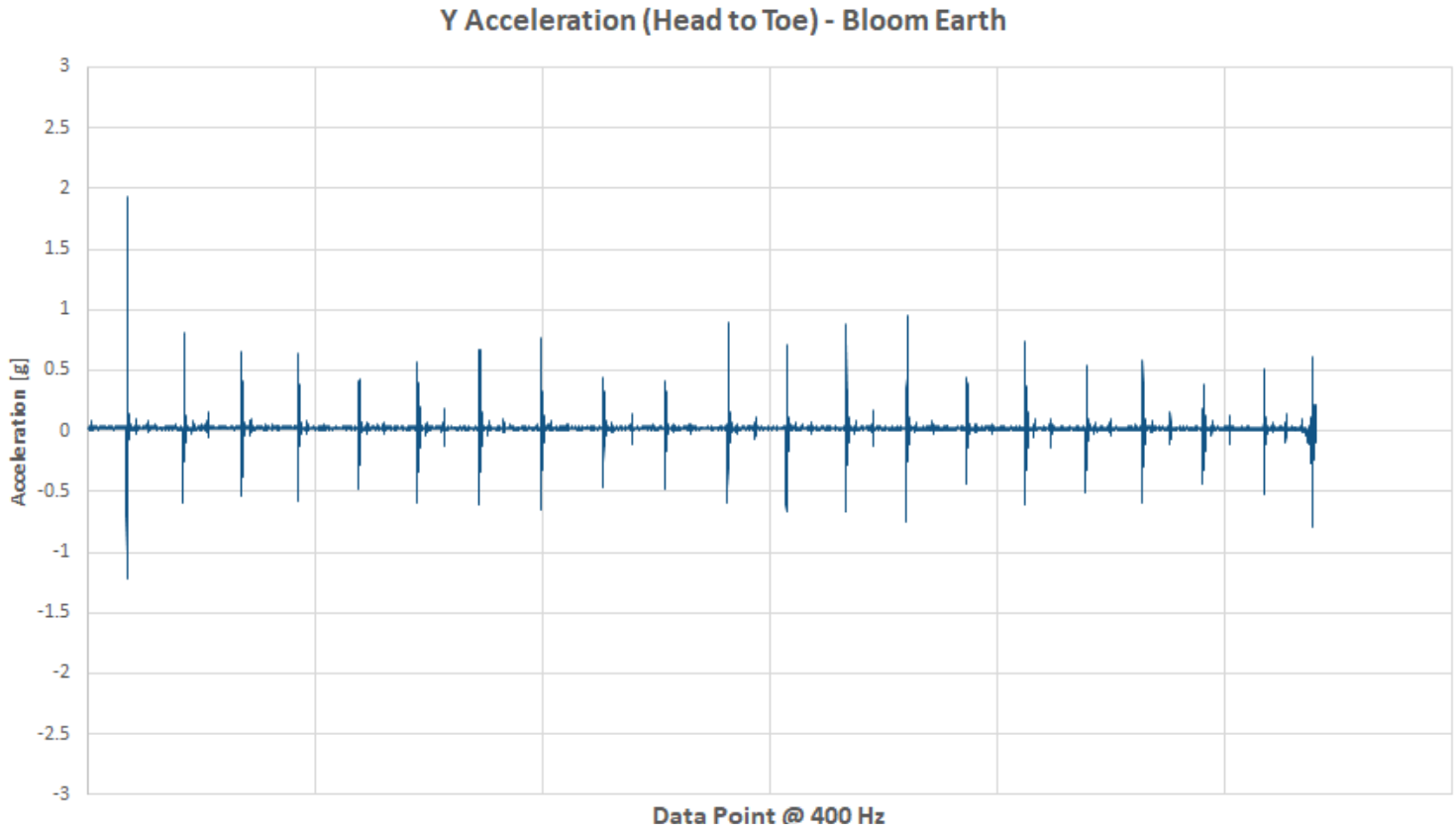

Y Acceleration (Head to Toe) - Bloom Mist
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

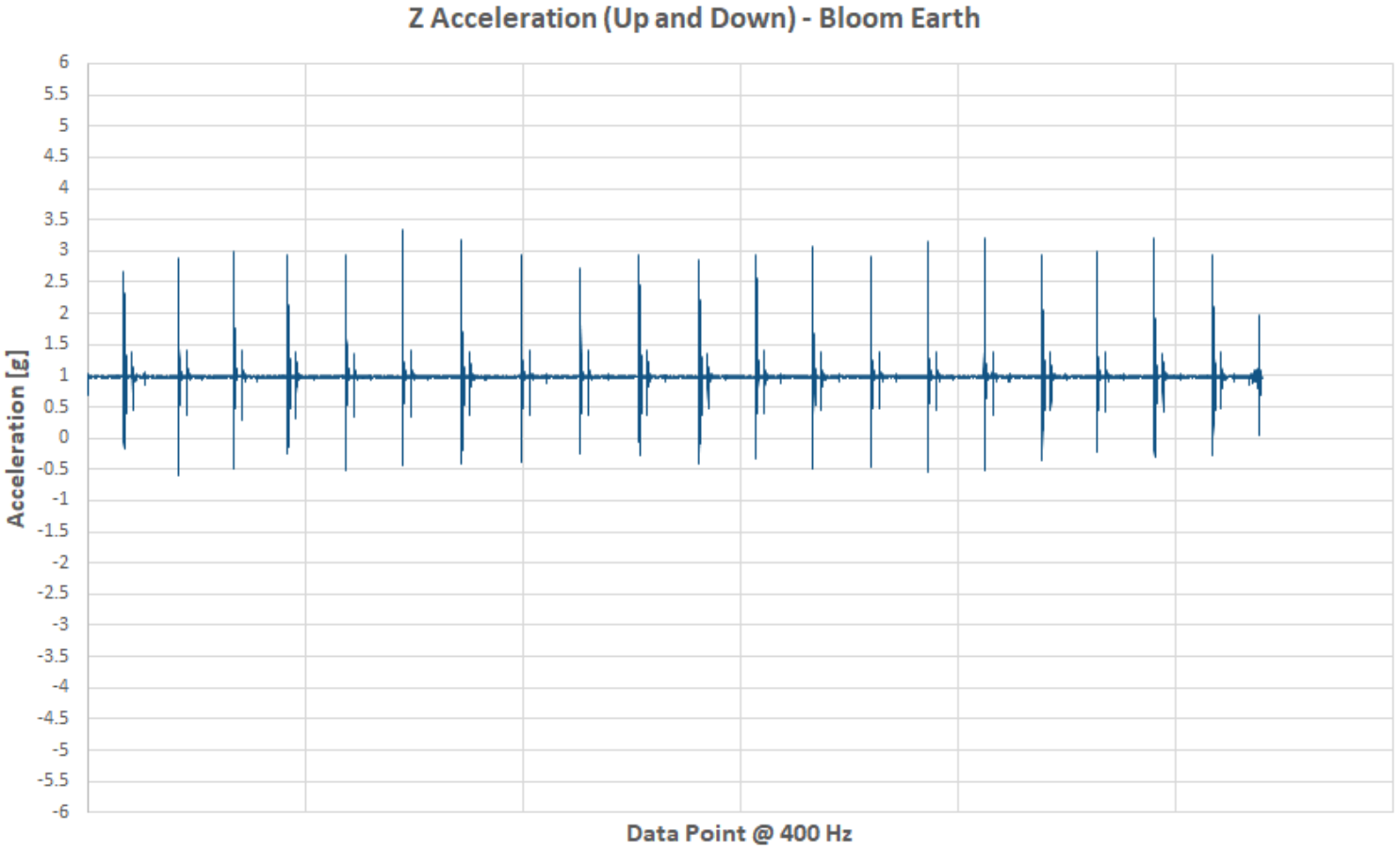

Z Acceleration (Up and Down) - Bloom Mist
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – BLOOM EARTH

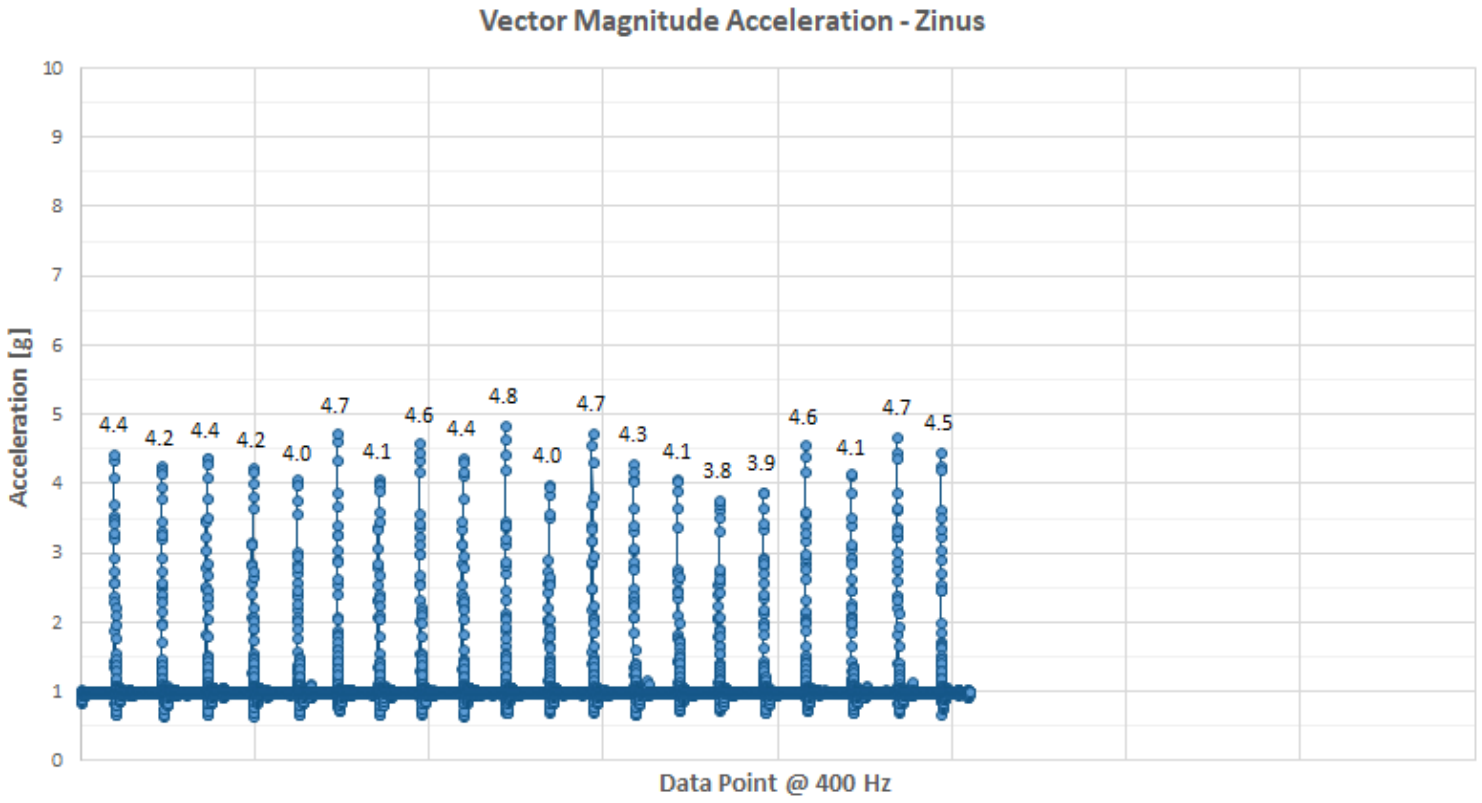


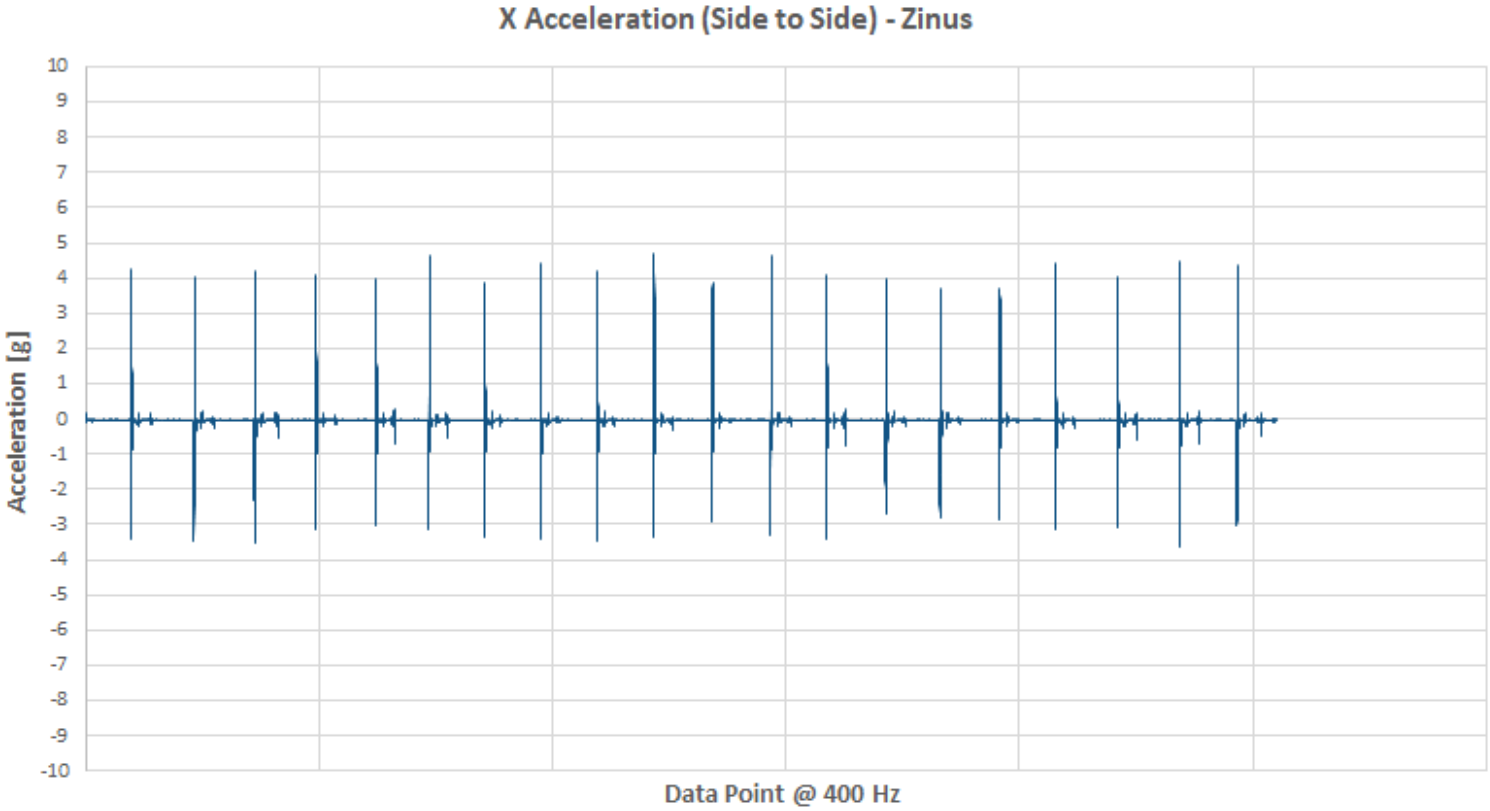



Y Acceleration (Head to Toe) - Bloom Earth
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

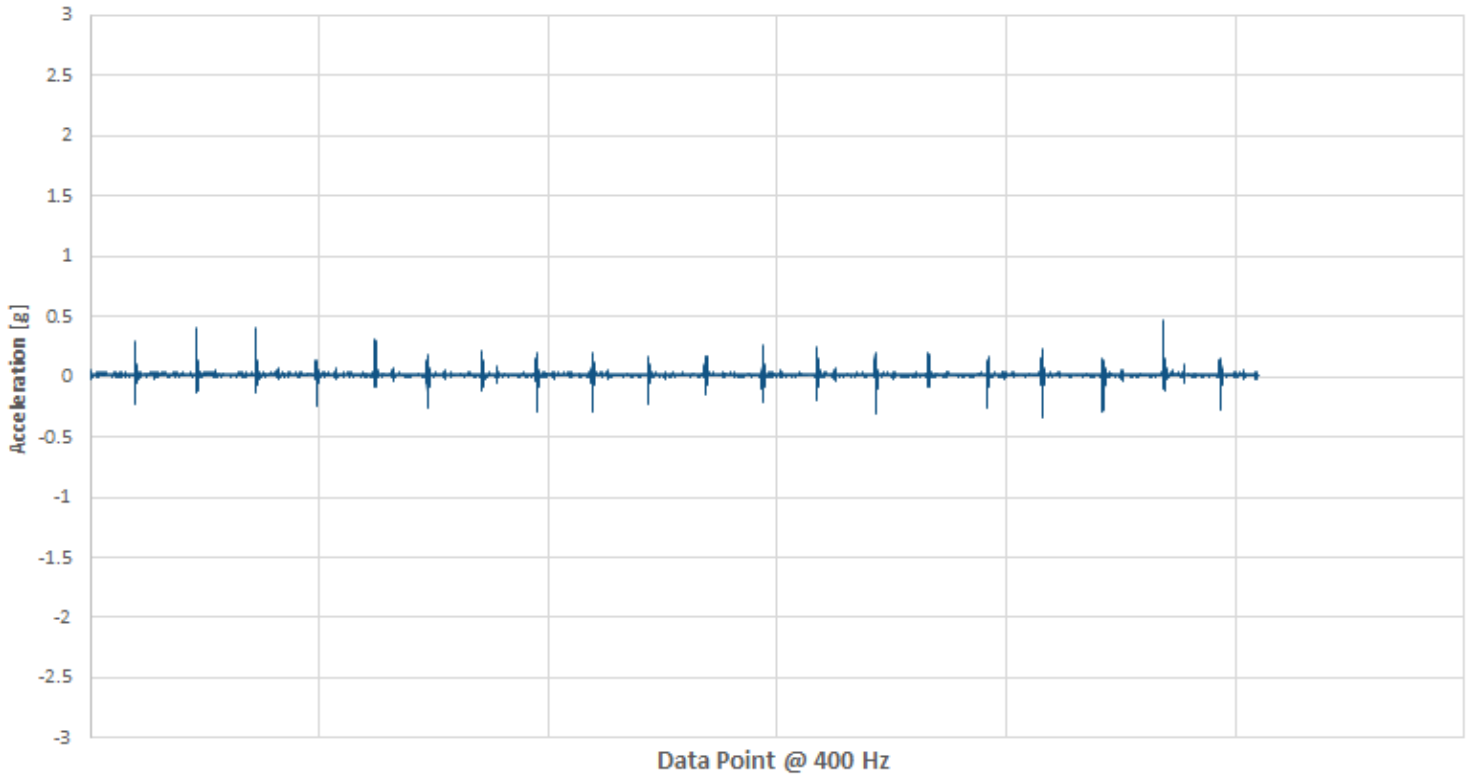

Z Acceleration (Up and Down) - Bloom Earth
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – ZINUS

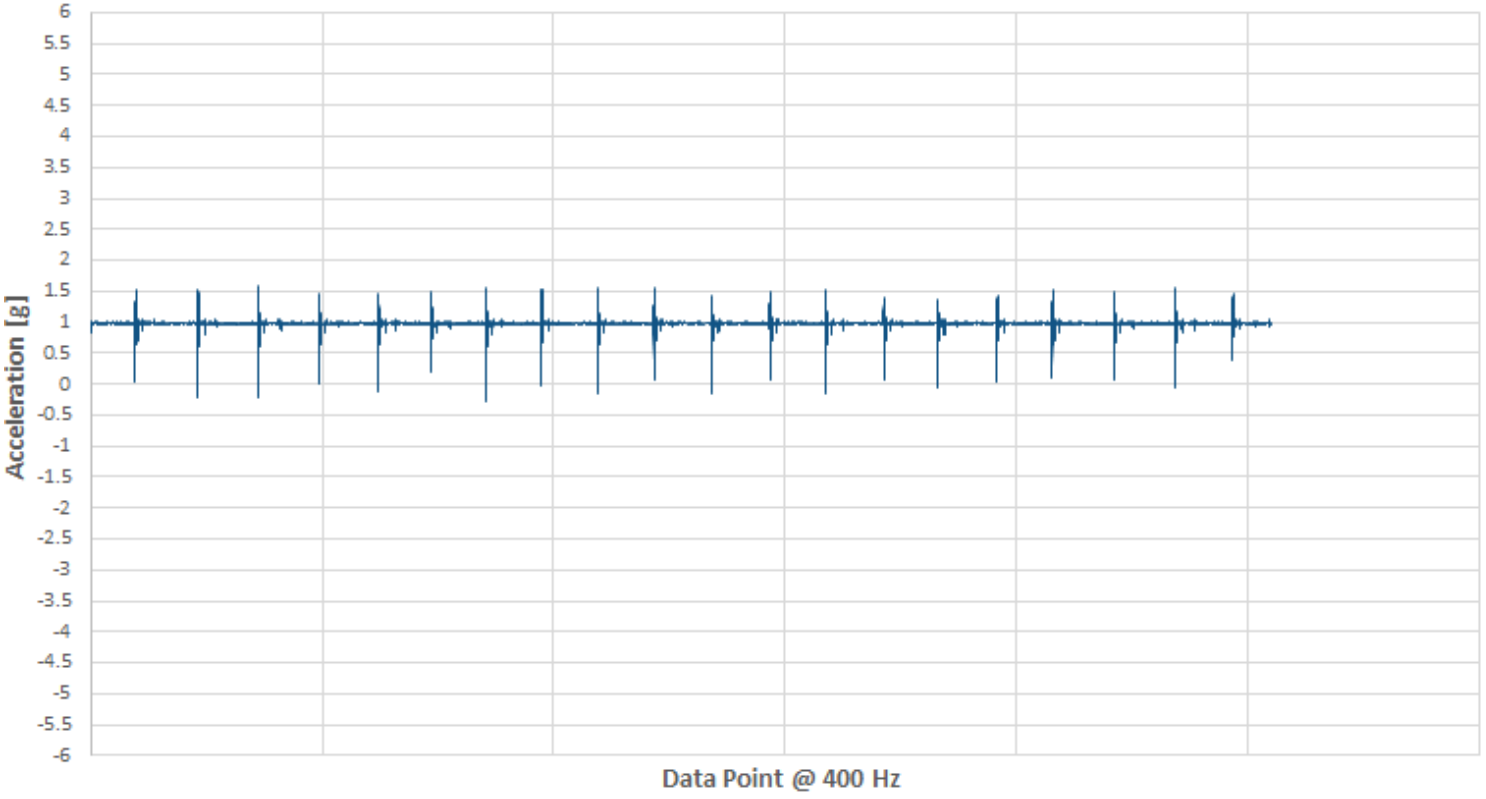

Vector Magnitude Acceleration - Zinus
Acceleration [g]
Data Point @ 400 Hz
4.4
4.2
4.4
4.2
4.0
4.7
4.1
4.6
4.4
4.8
4.0
4.7
4.3
4.1
3.8
3.9
4.6
4.1
4.7
4.5


X Acceleration (Side to Side) - Zinus
Acceleration [g]
Data Point @ 400 Hz

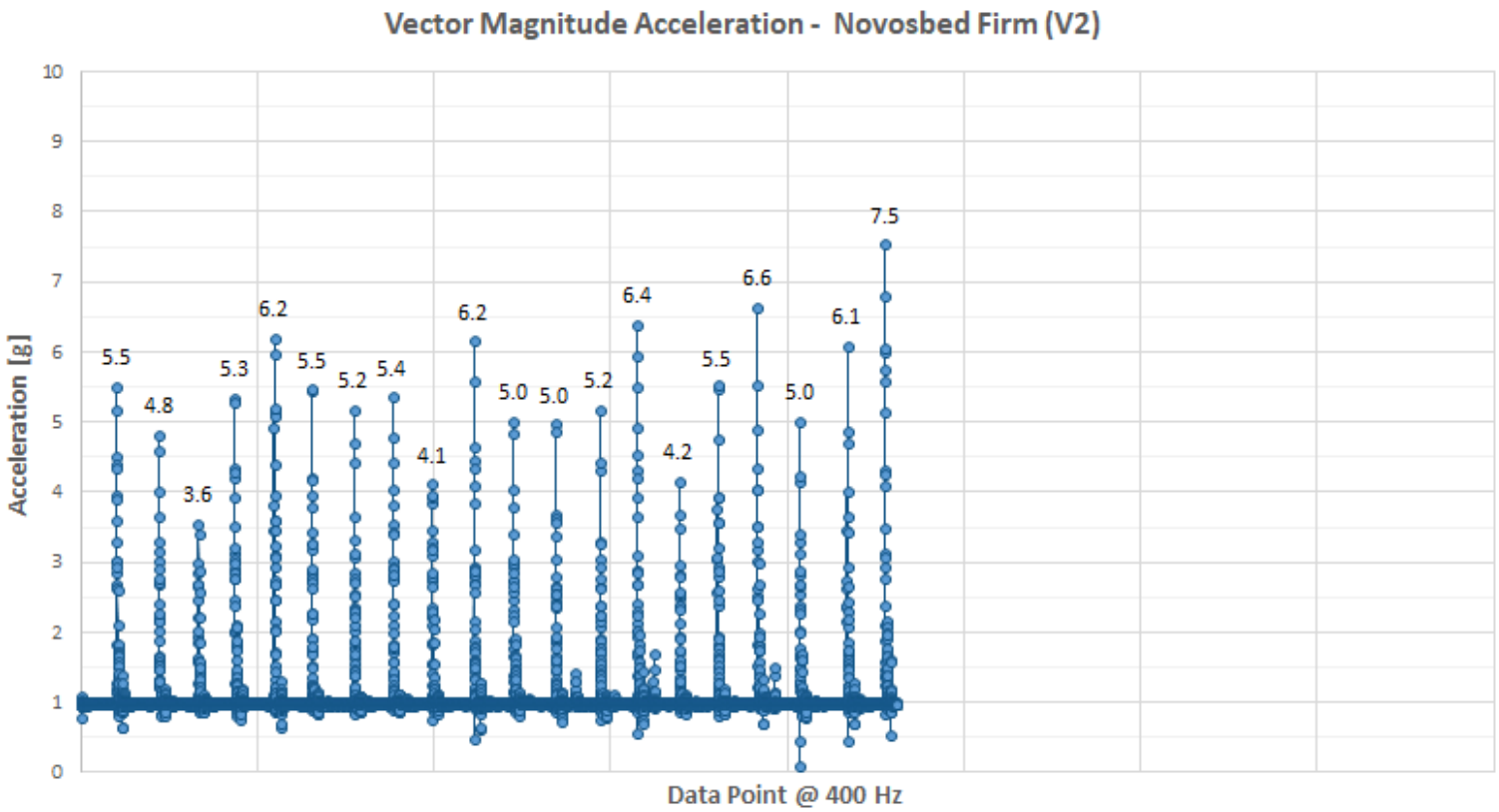
Y Acceleration (Head to Toe) - Zinus

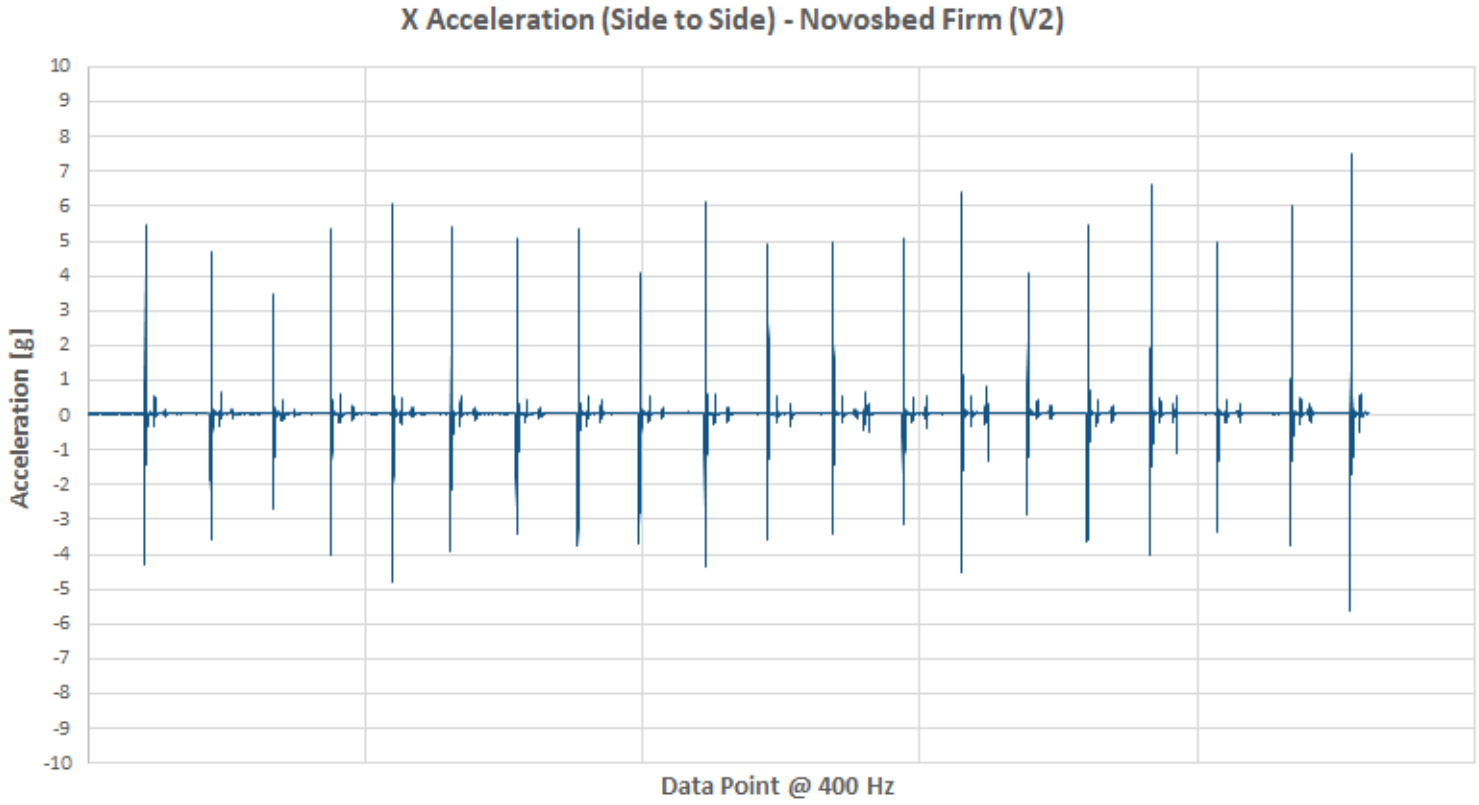


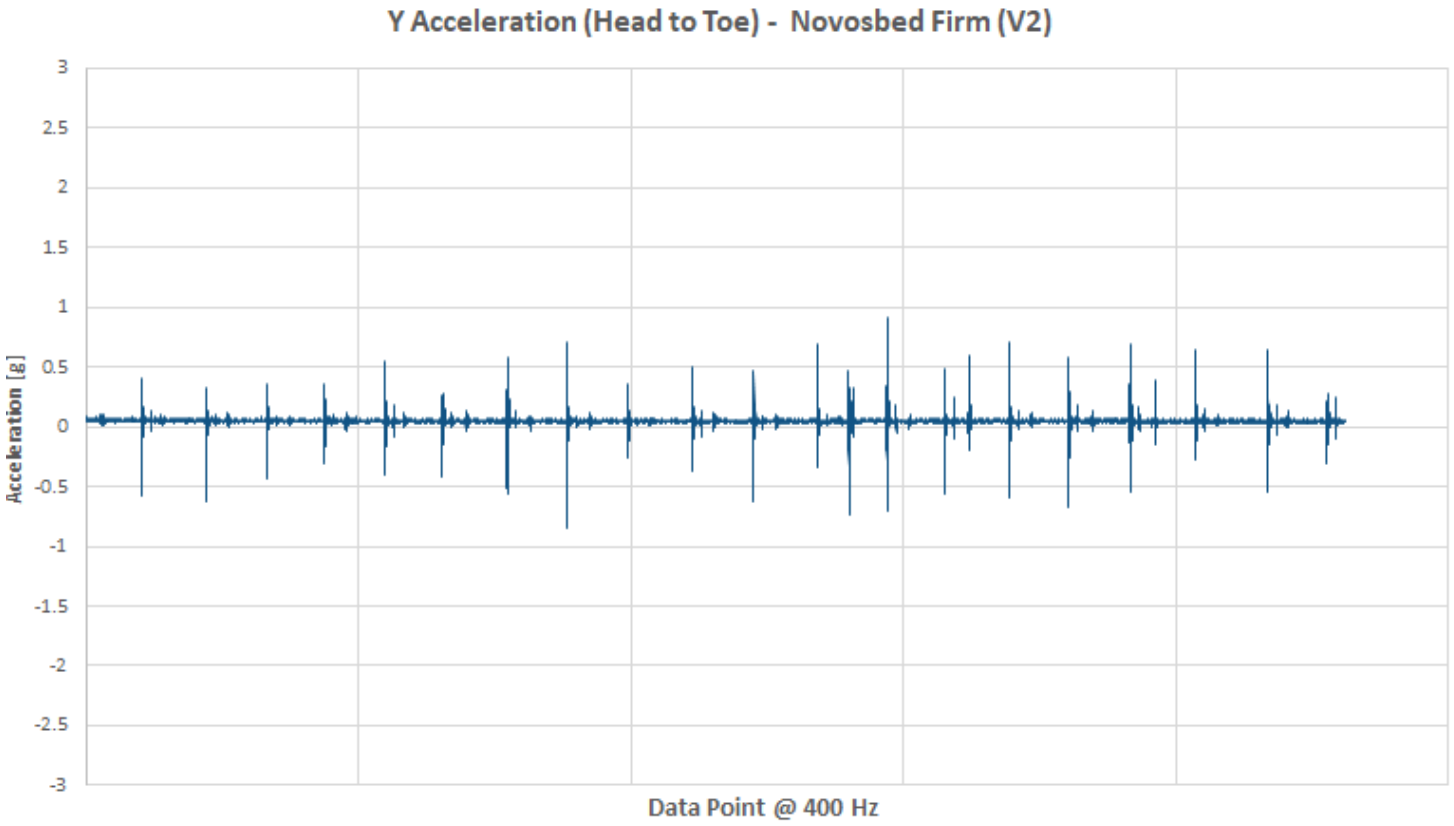
Z Acceleration (Up and Down) - Zinus

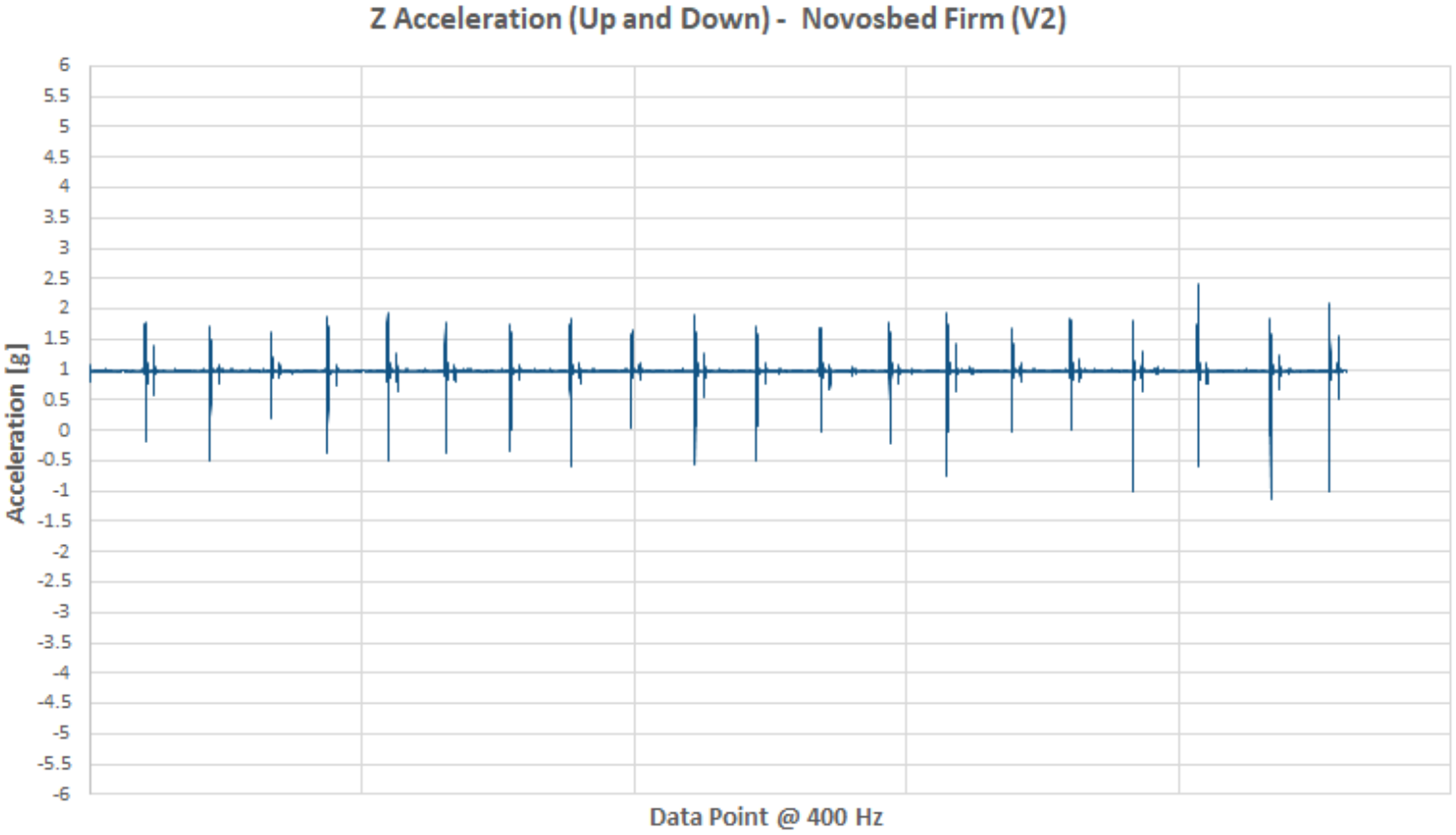


TEST 3 – NOVOSBED FIRM (V2)

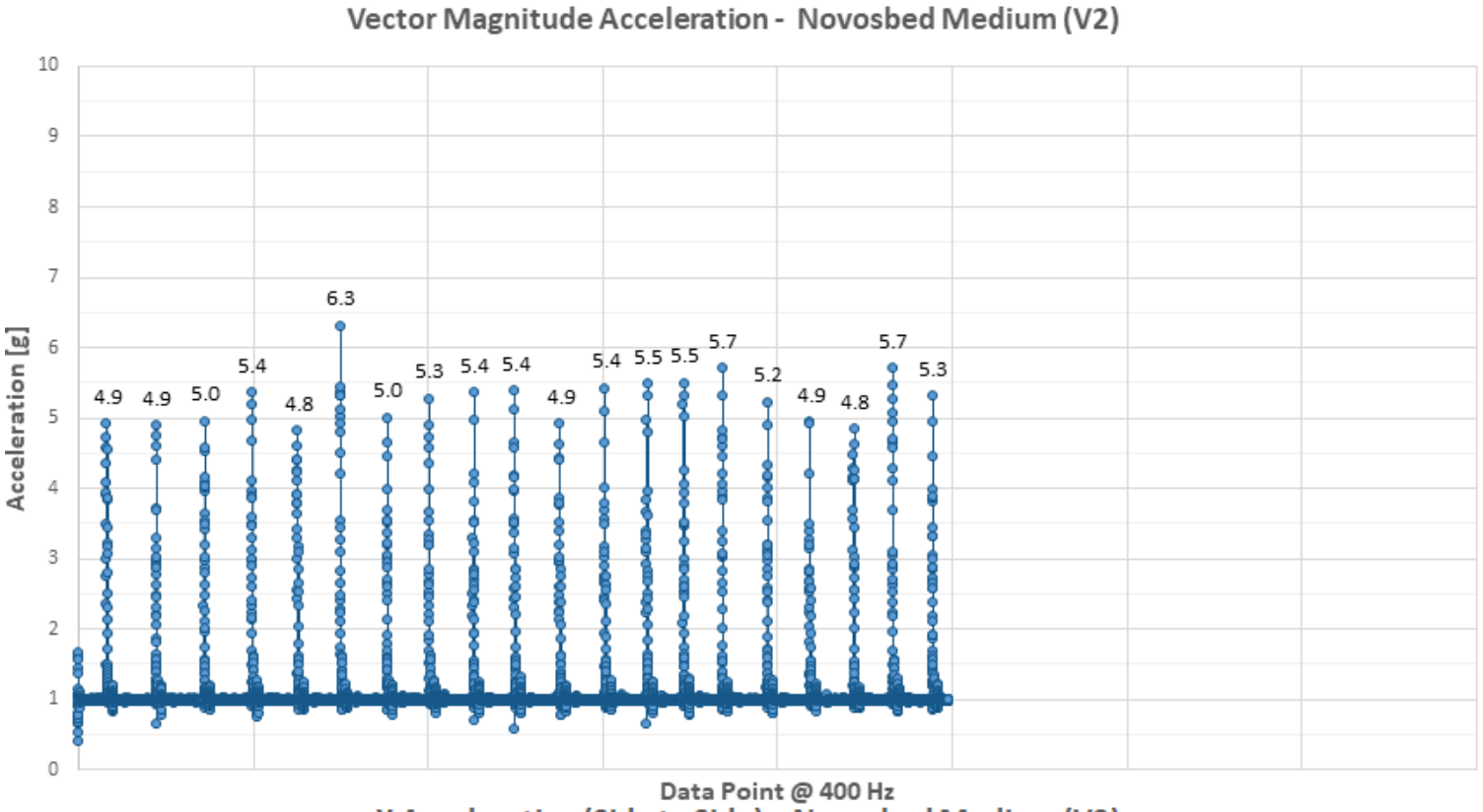


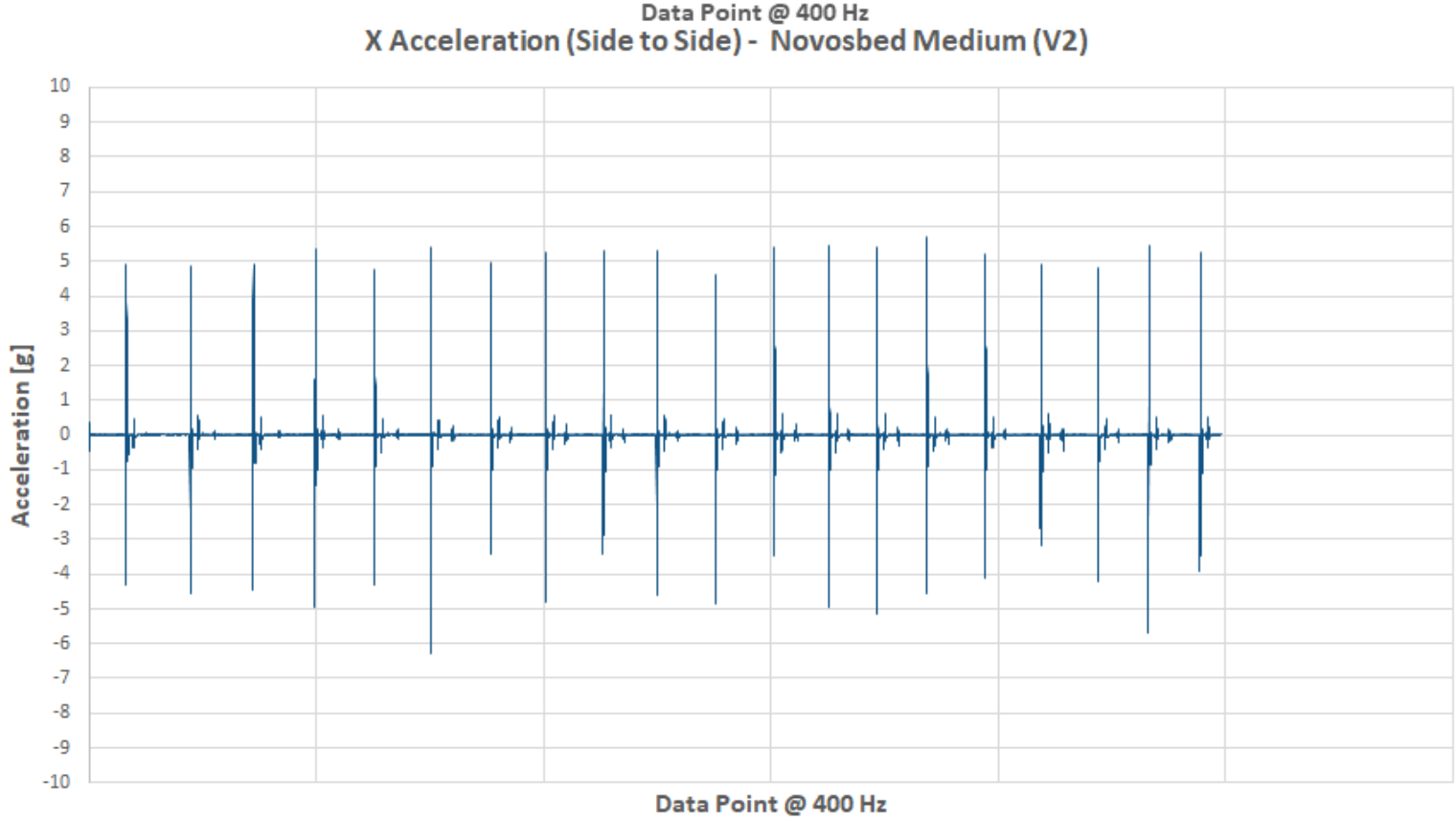


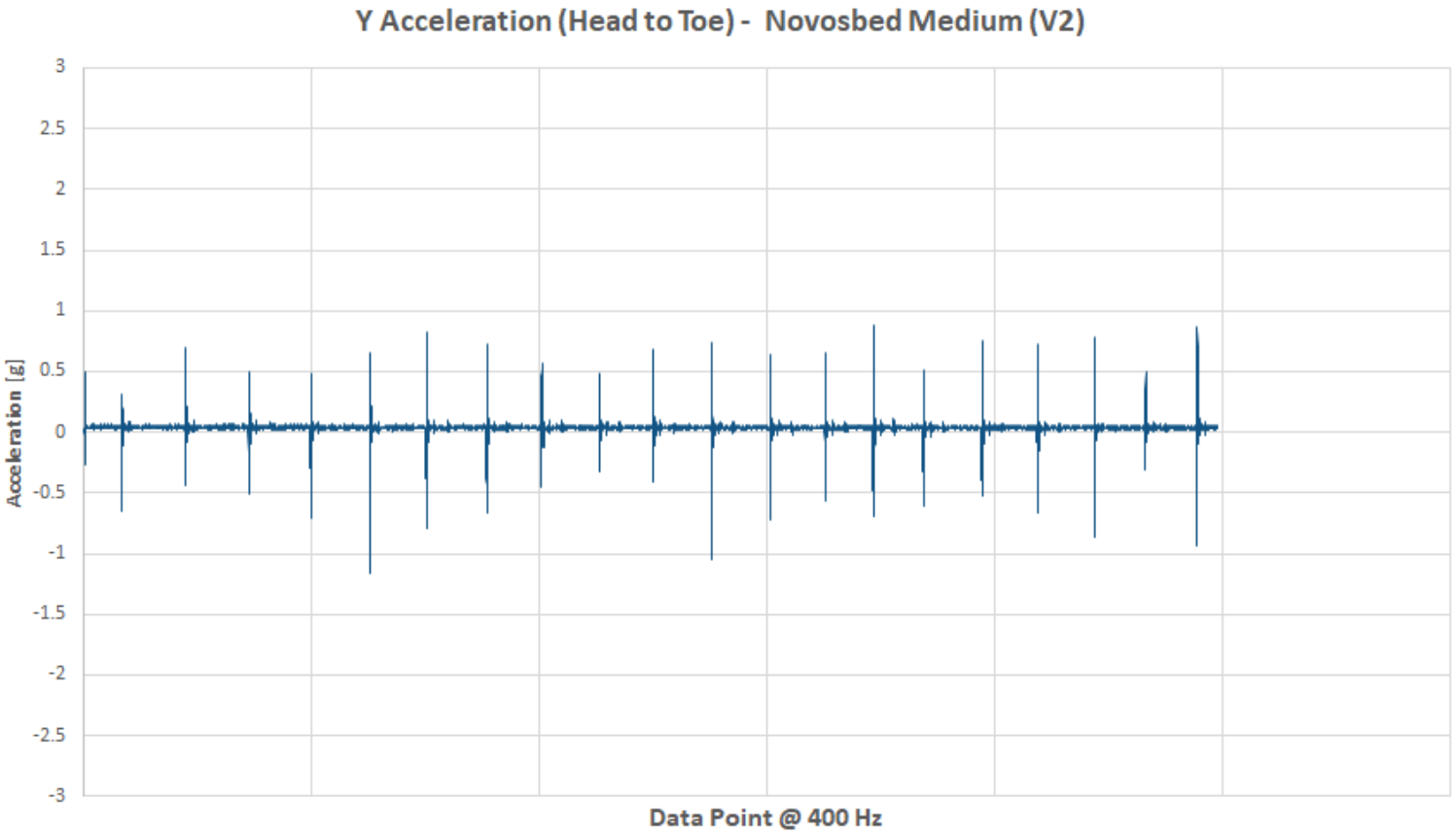

Y Acceleration (Head to Toe) - Novosbed Firm (V2)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

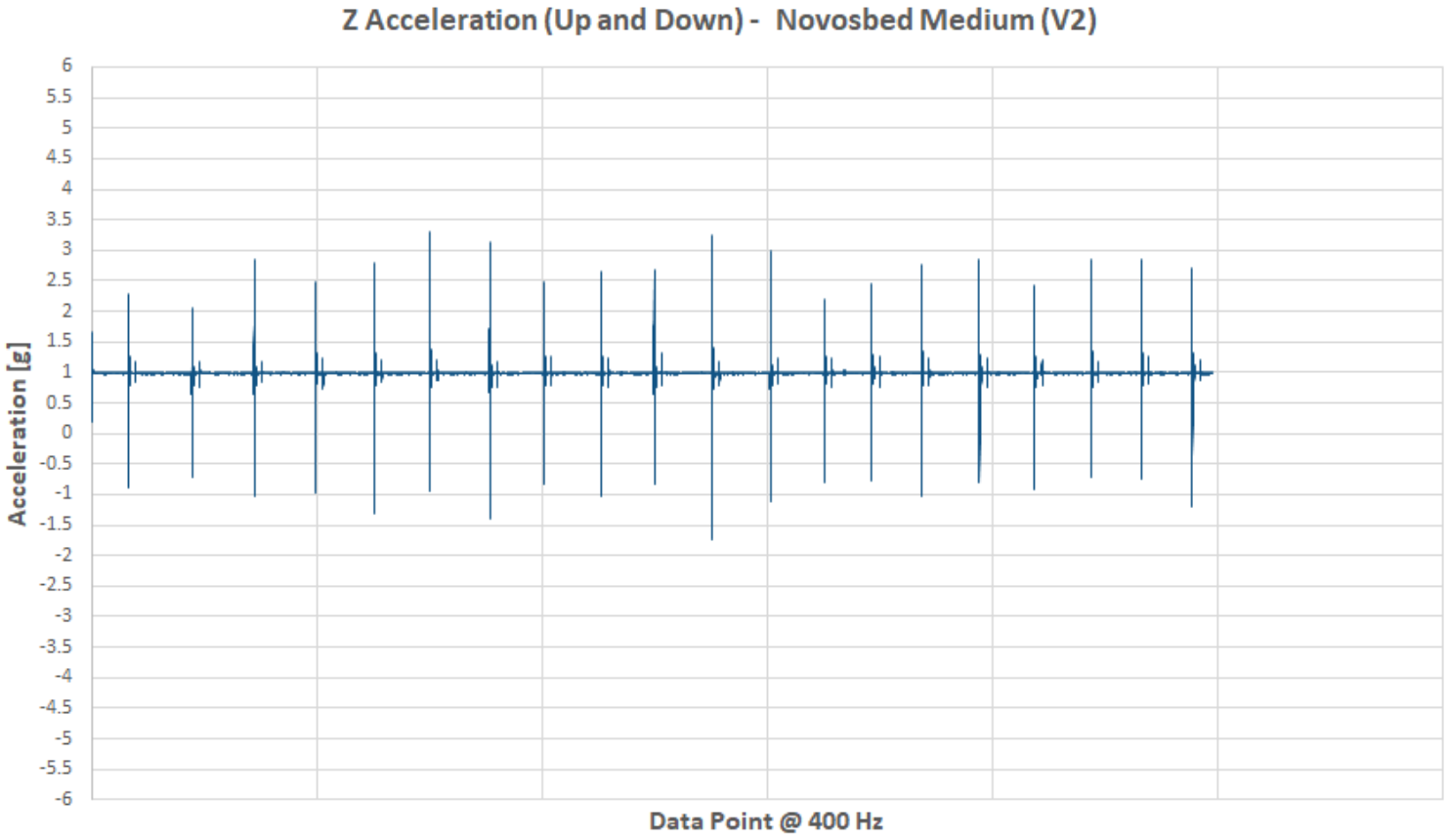

Z Acceleration (Up and Down) - Novosbed Firm (V2)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – NOVOSBED MEDIUM (V2)

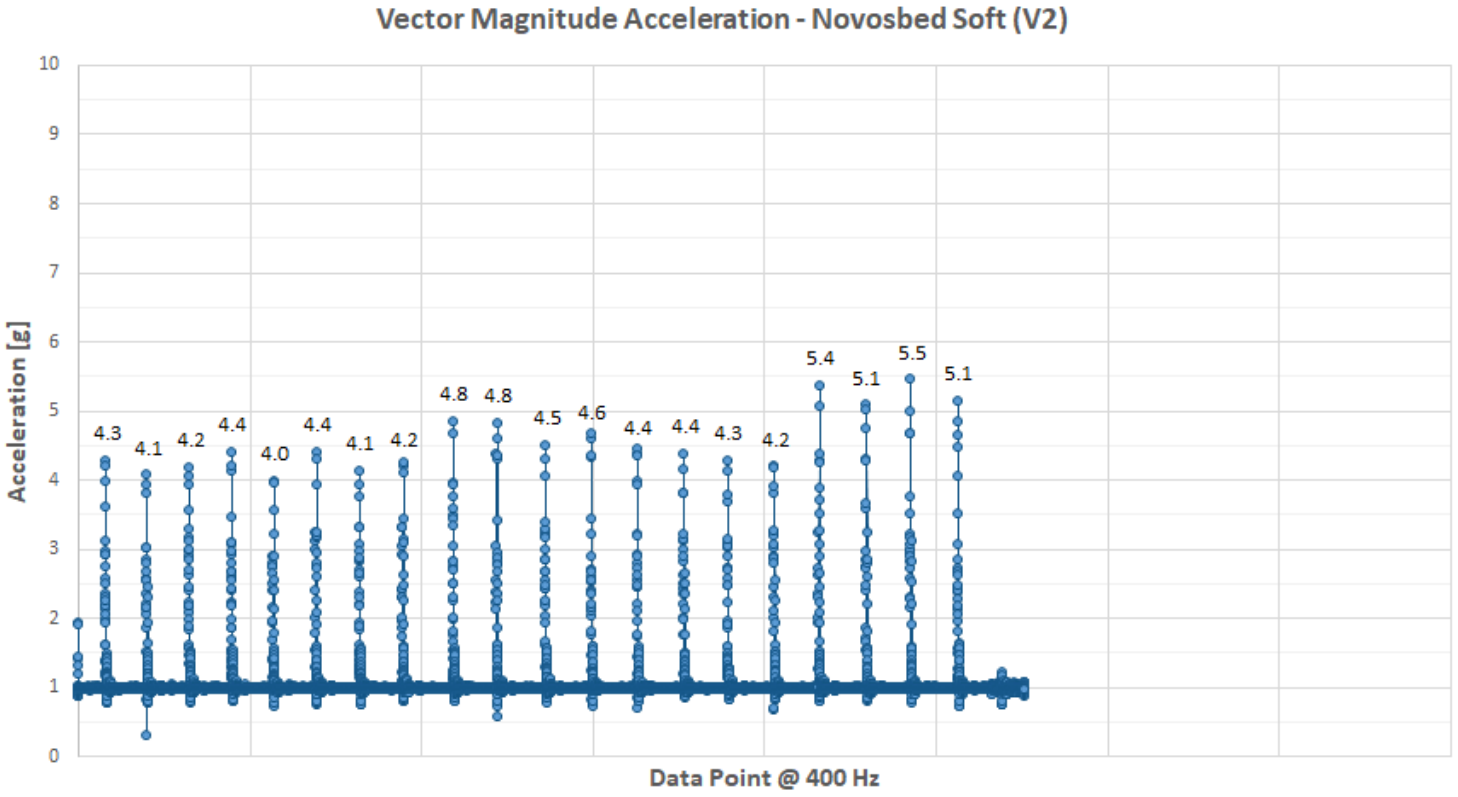


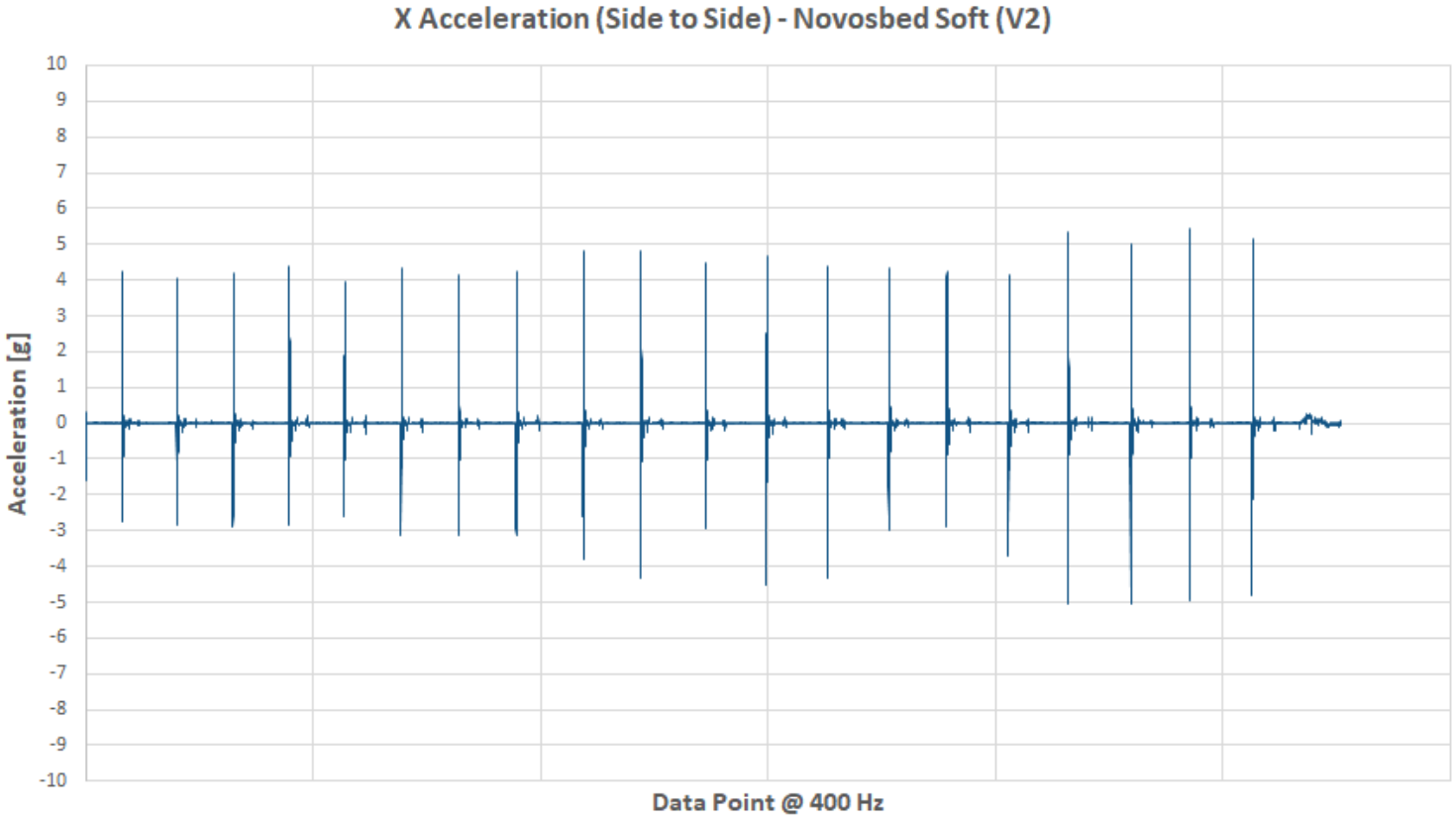


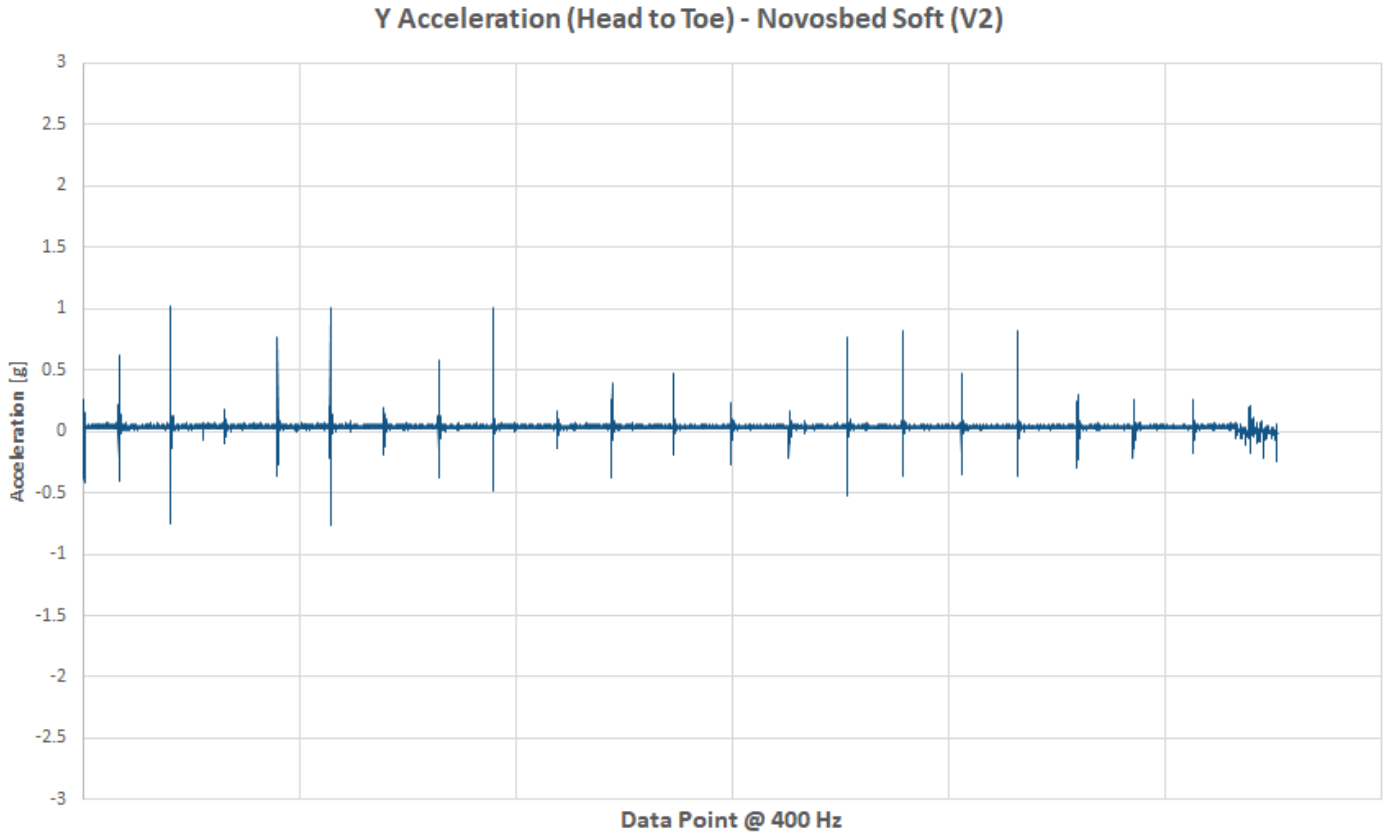

Y Acceleration (Head to Toe) - Novosbed Medium (V2)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

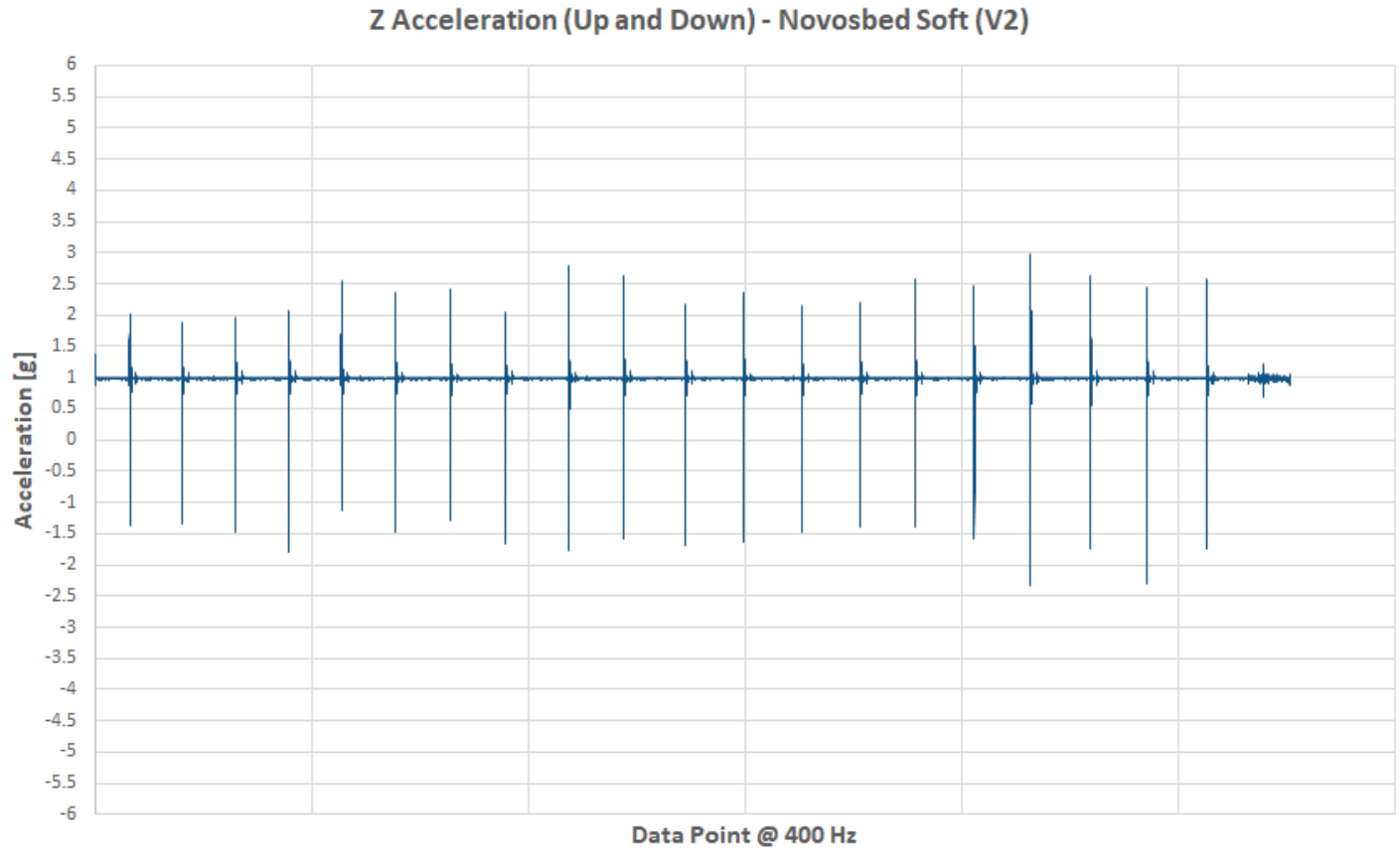

Z Acceleration (Up and Down) - Novosbed Medium (V2)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – NOVOSBED SOFT (V2)

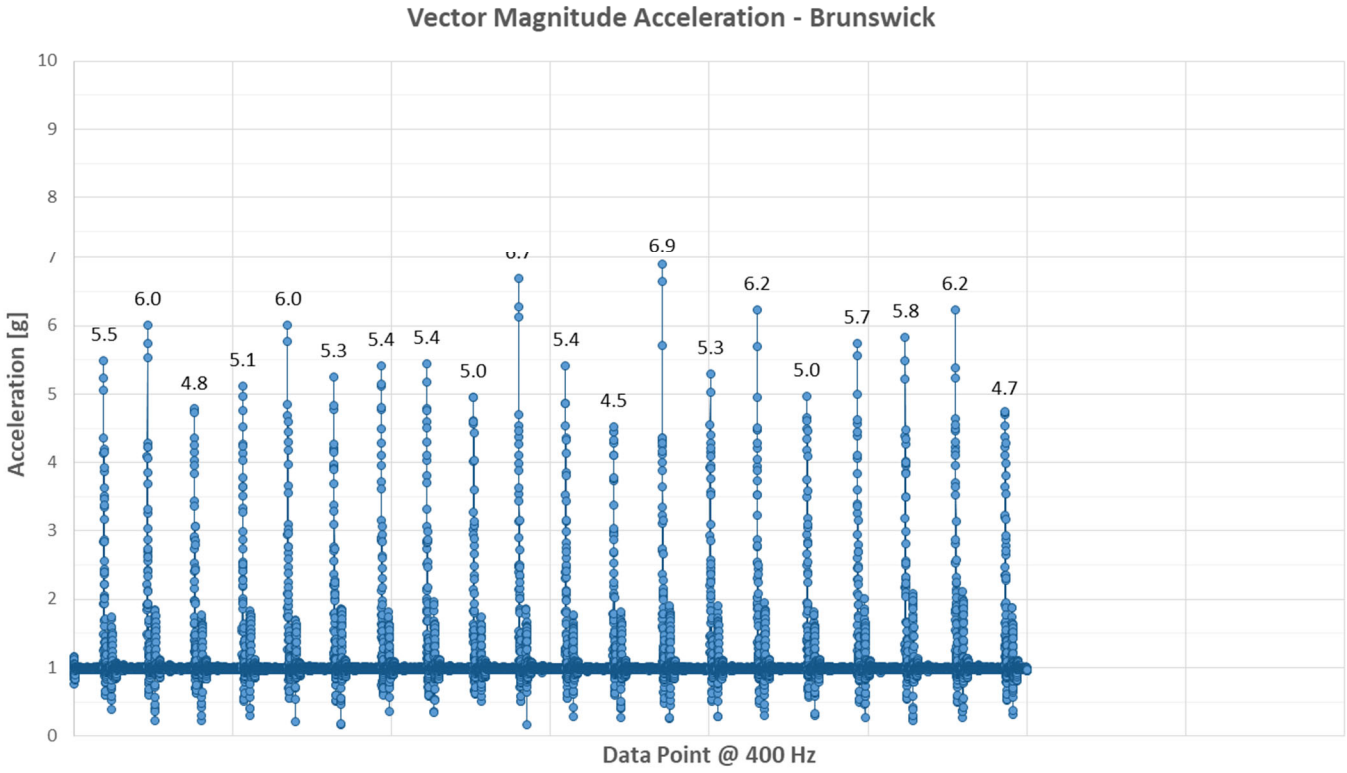


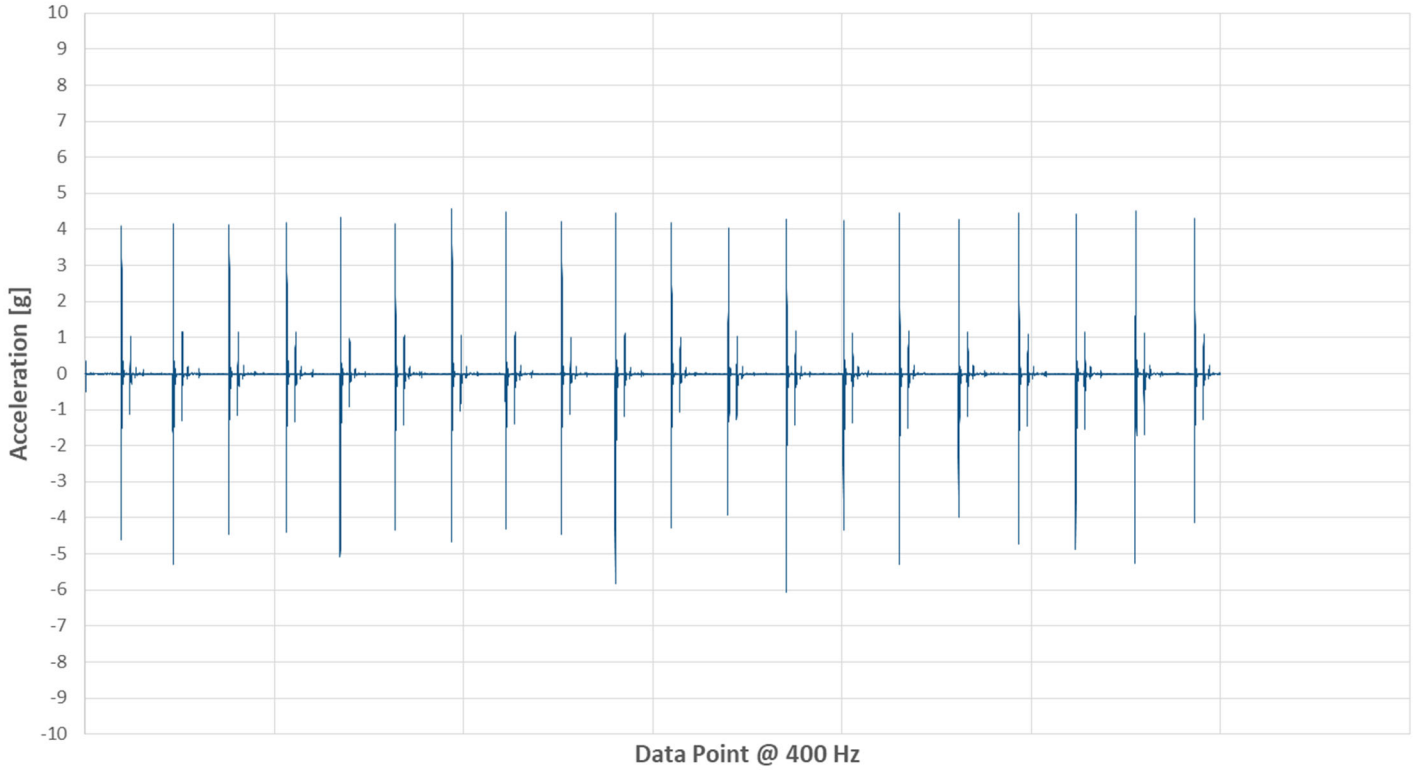


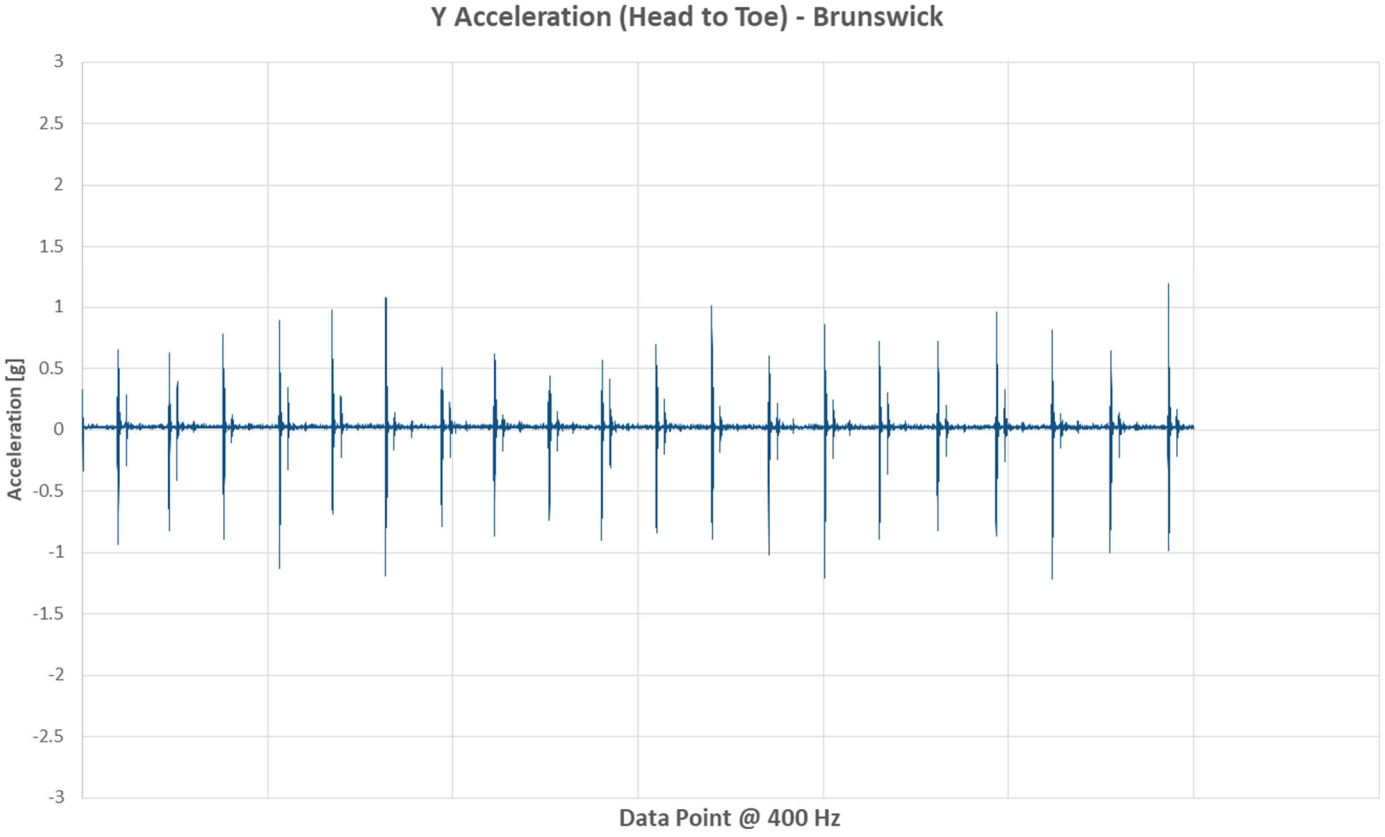

Y Acceleration (Head to Toe) - Novosbed Soft (V2)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

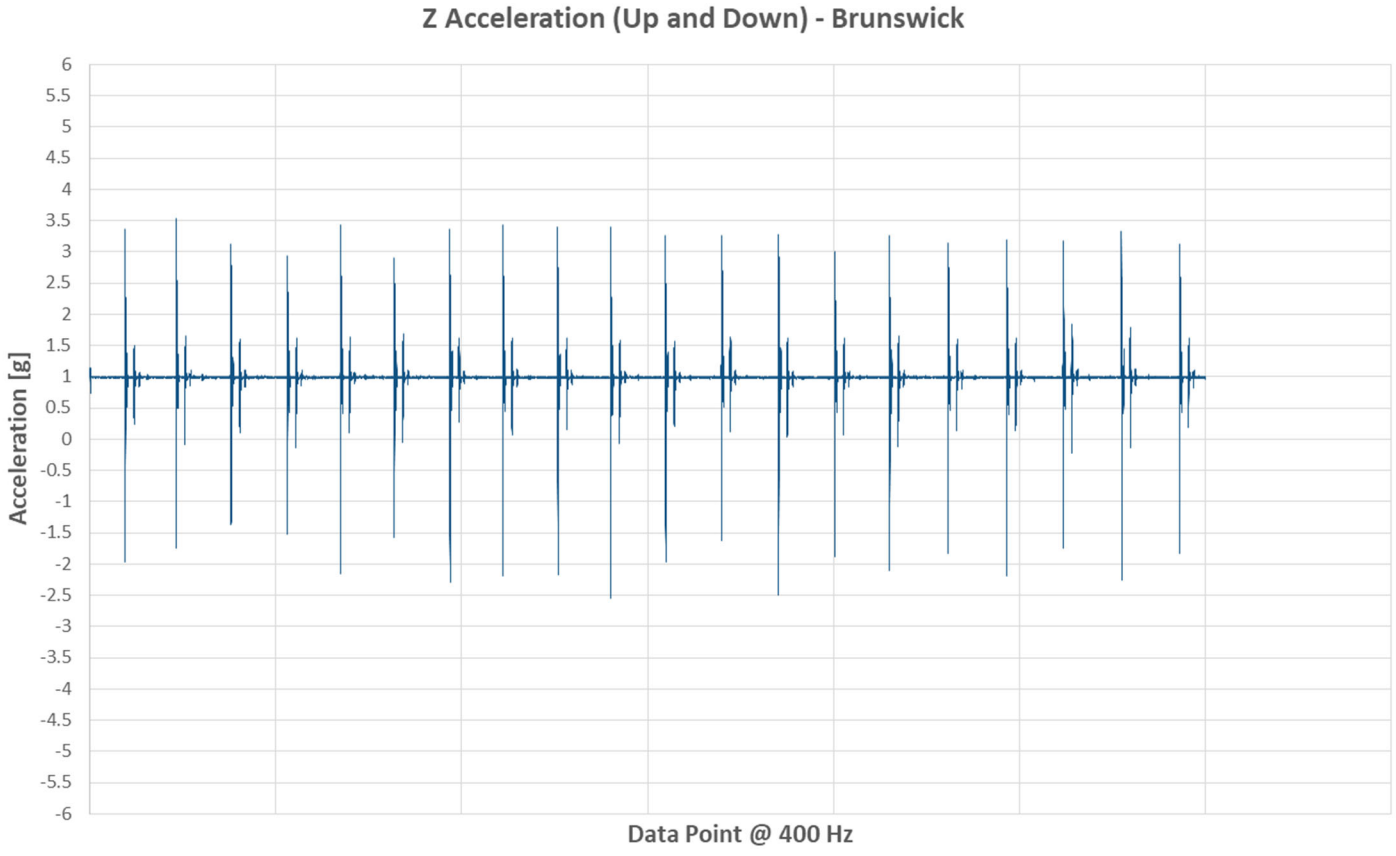

Z Acceleration (Up and Down) - Novosbed Soft (V2)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – BRUNSWICK

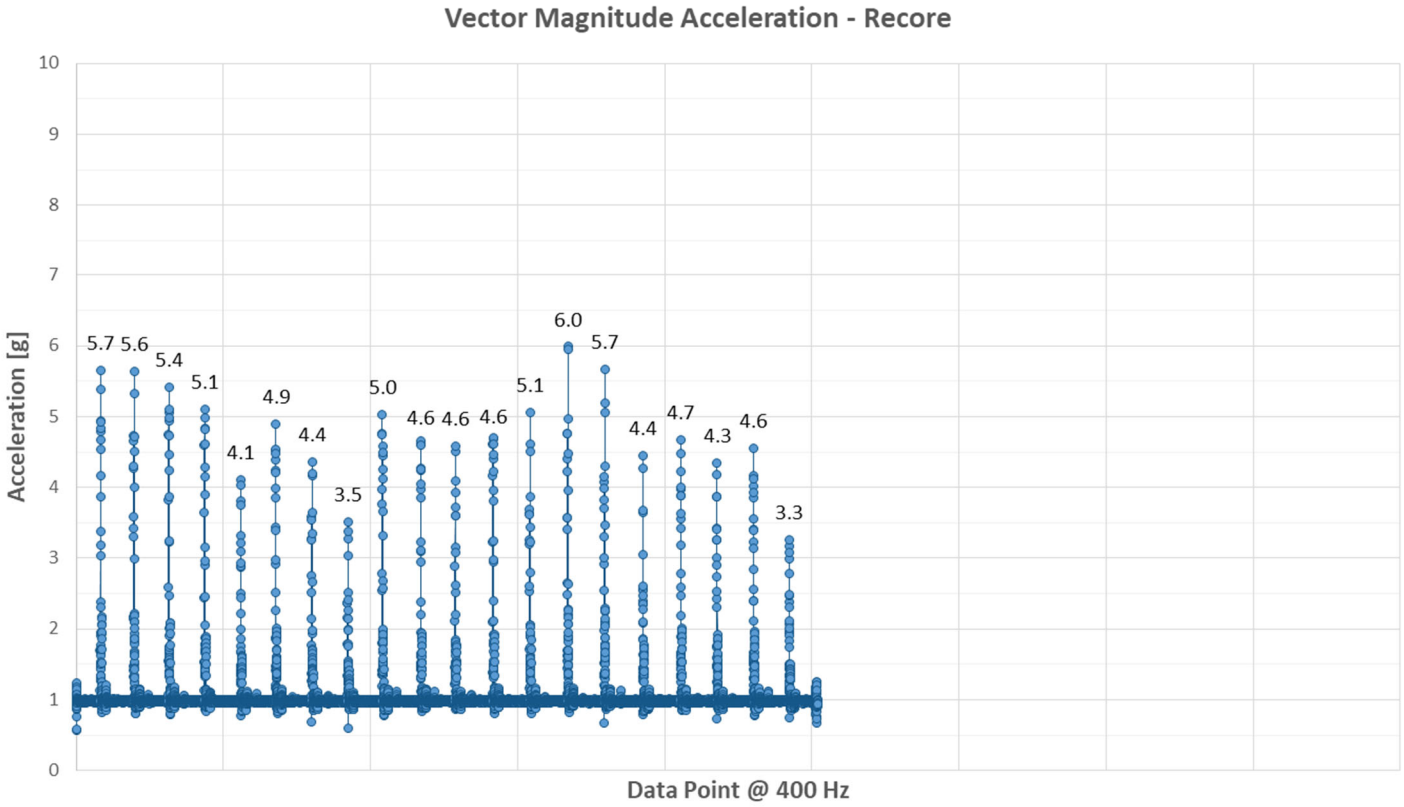


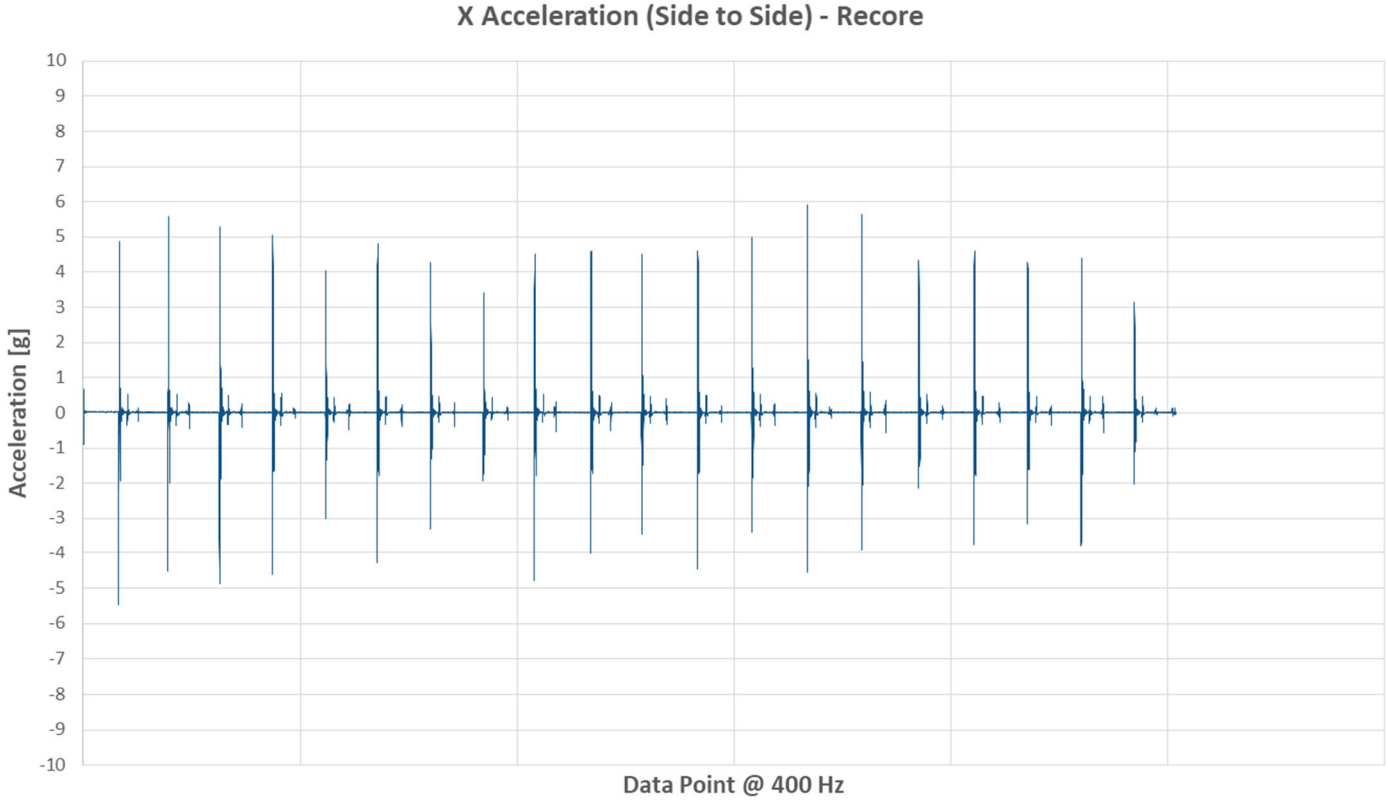


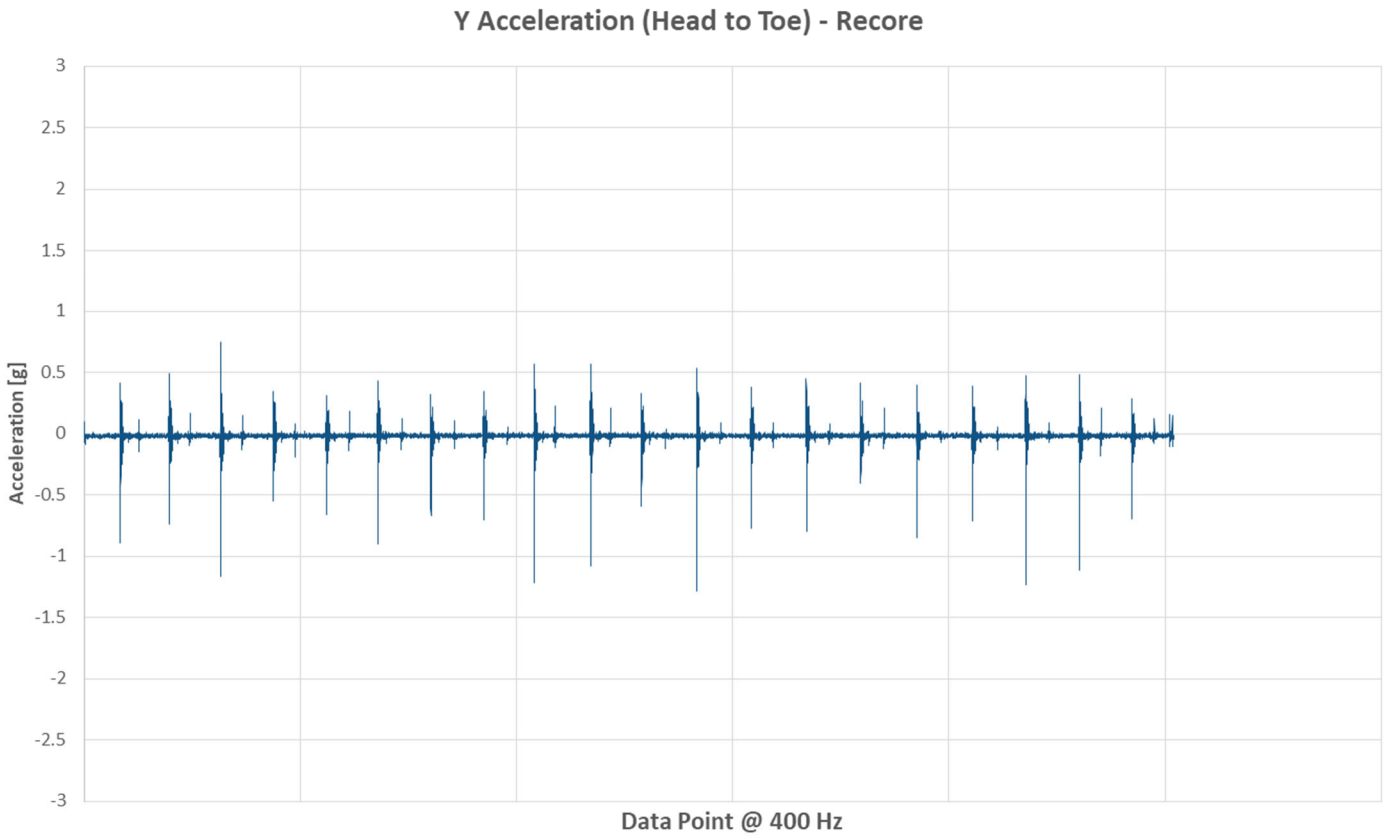

Y Acceleration (Head to Toe) - Brunswick
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

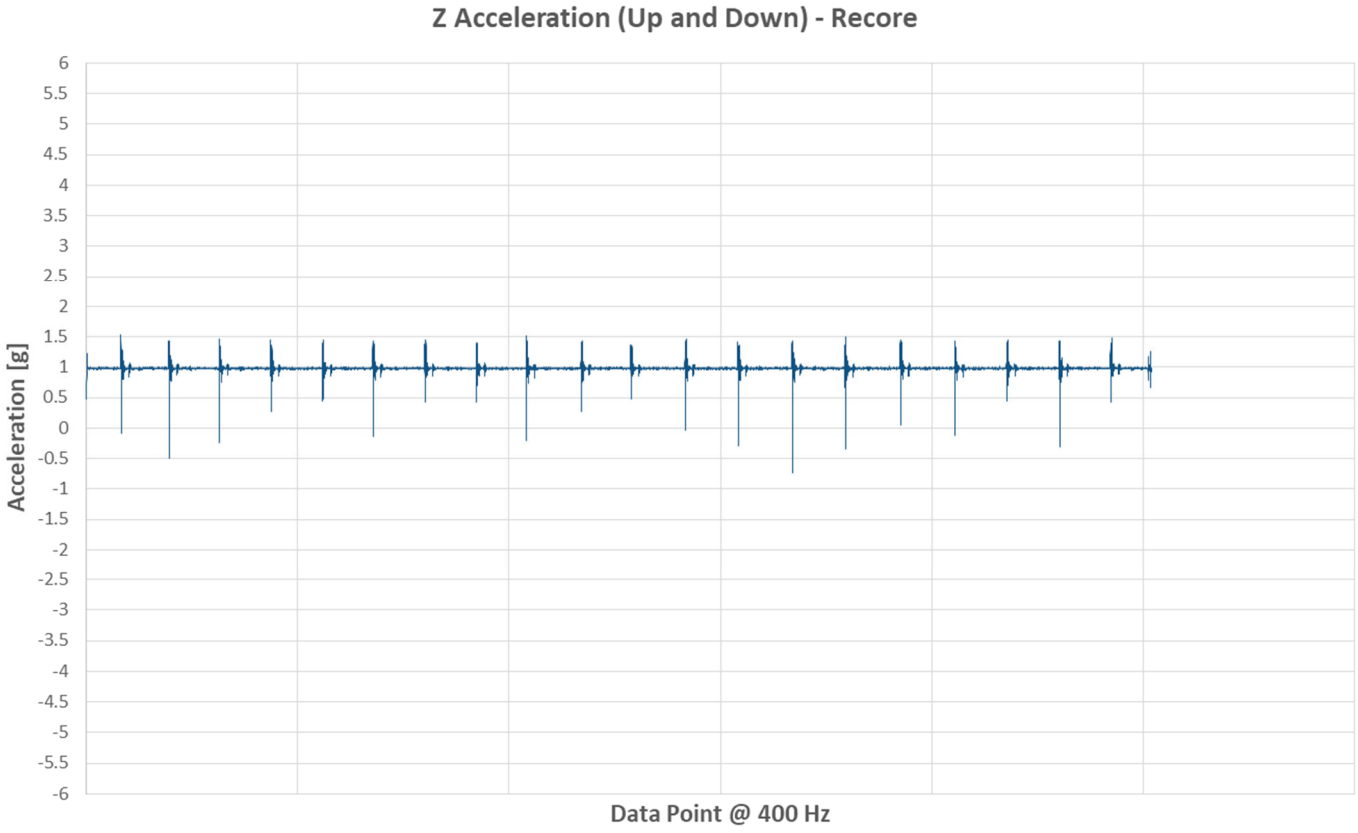

Z Acceleration (Up and Down) - Brunswick
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – RECORE

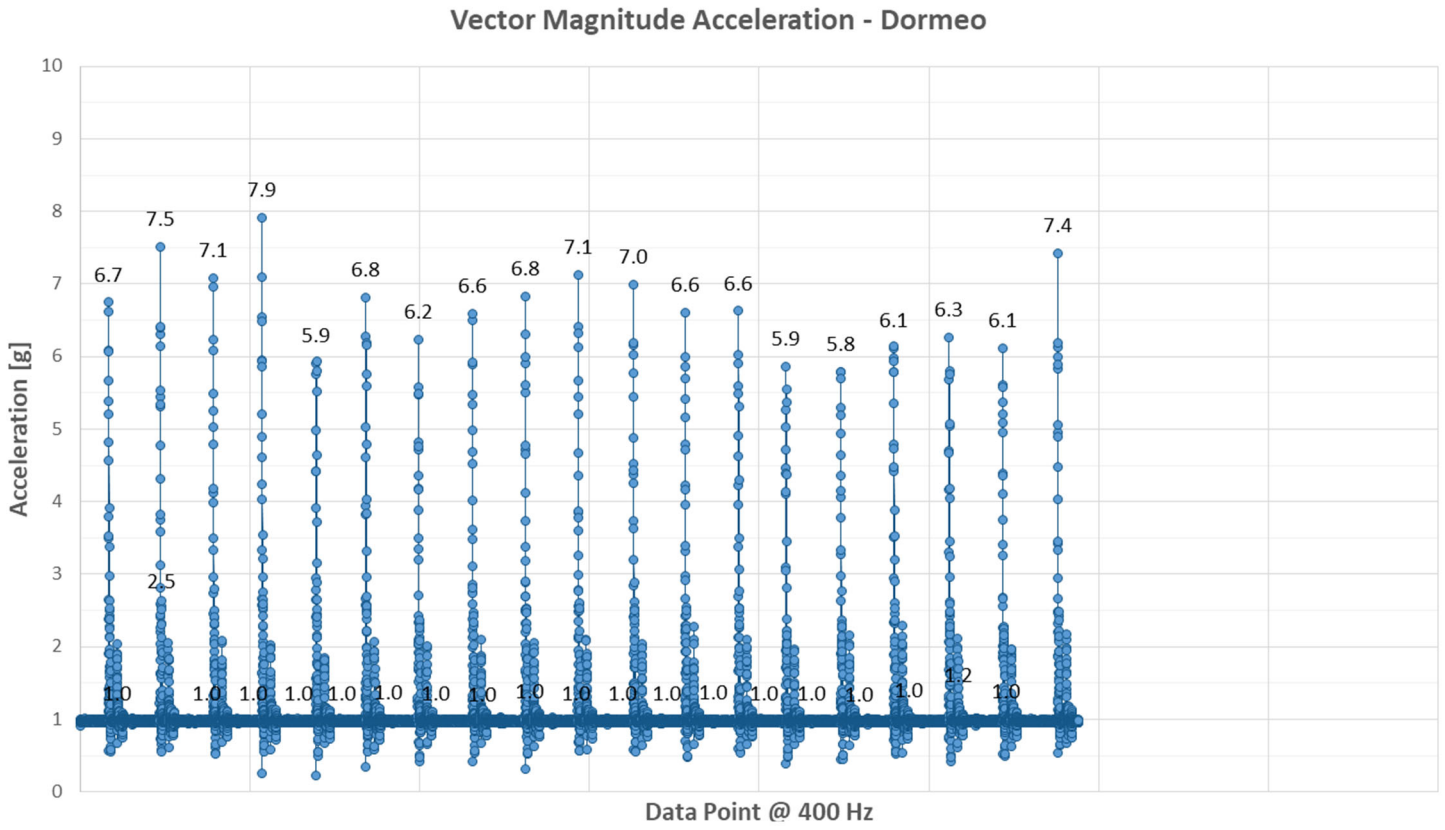


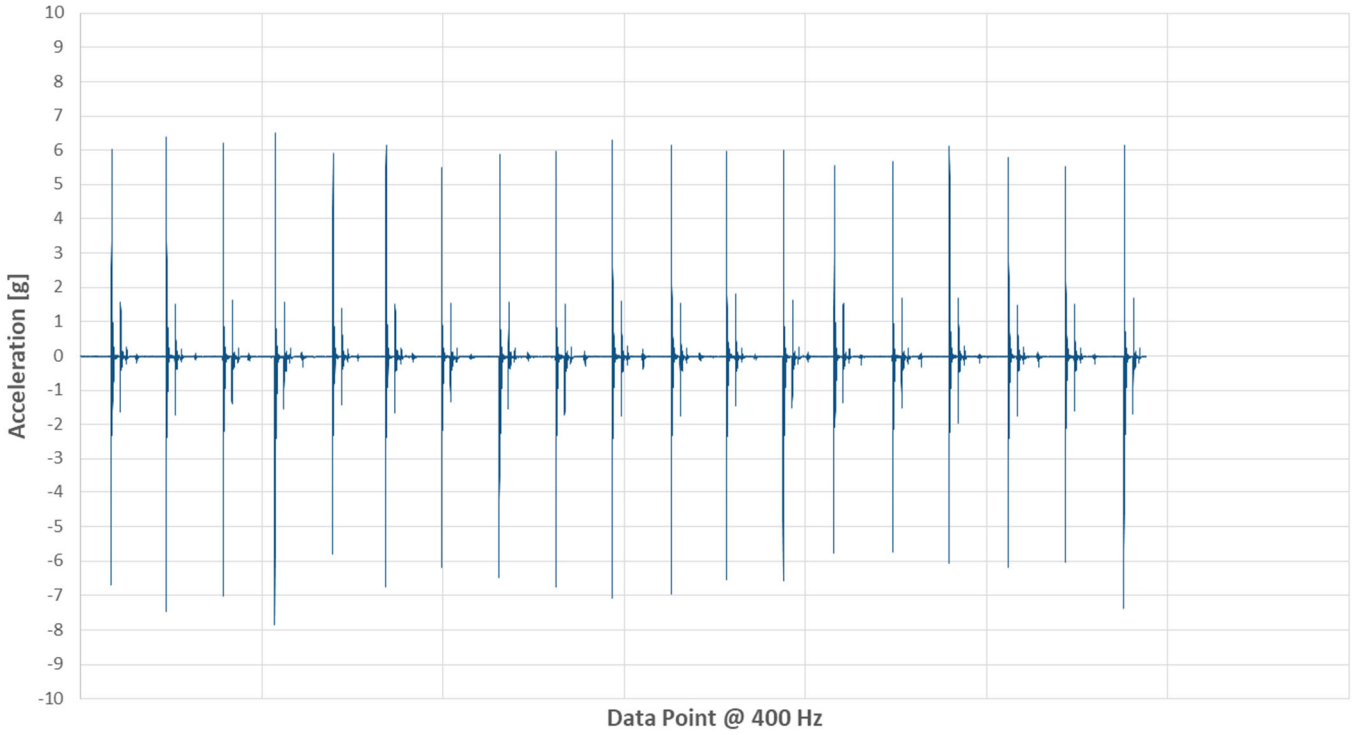


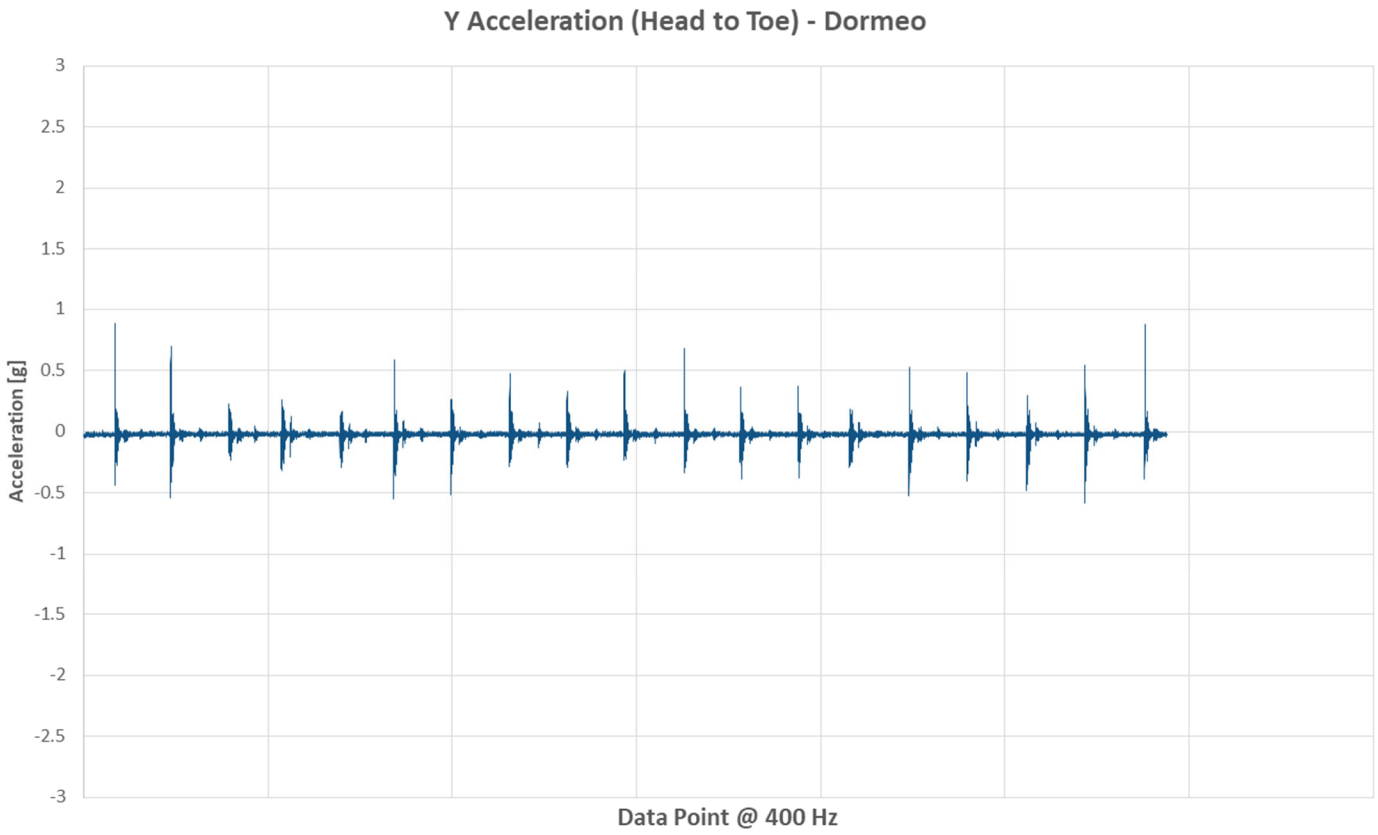

Y Acceleration (Head to Toe) - Recore
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

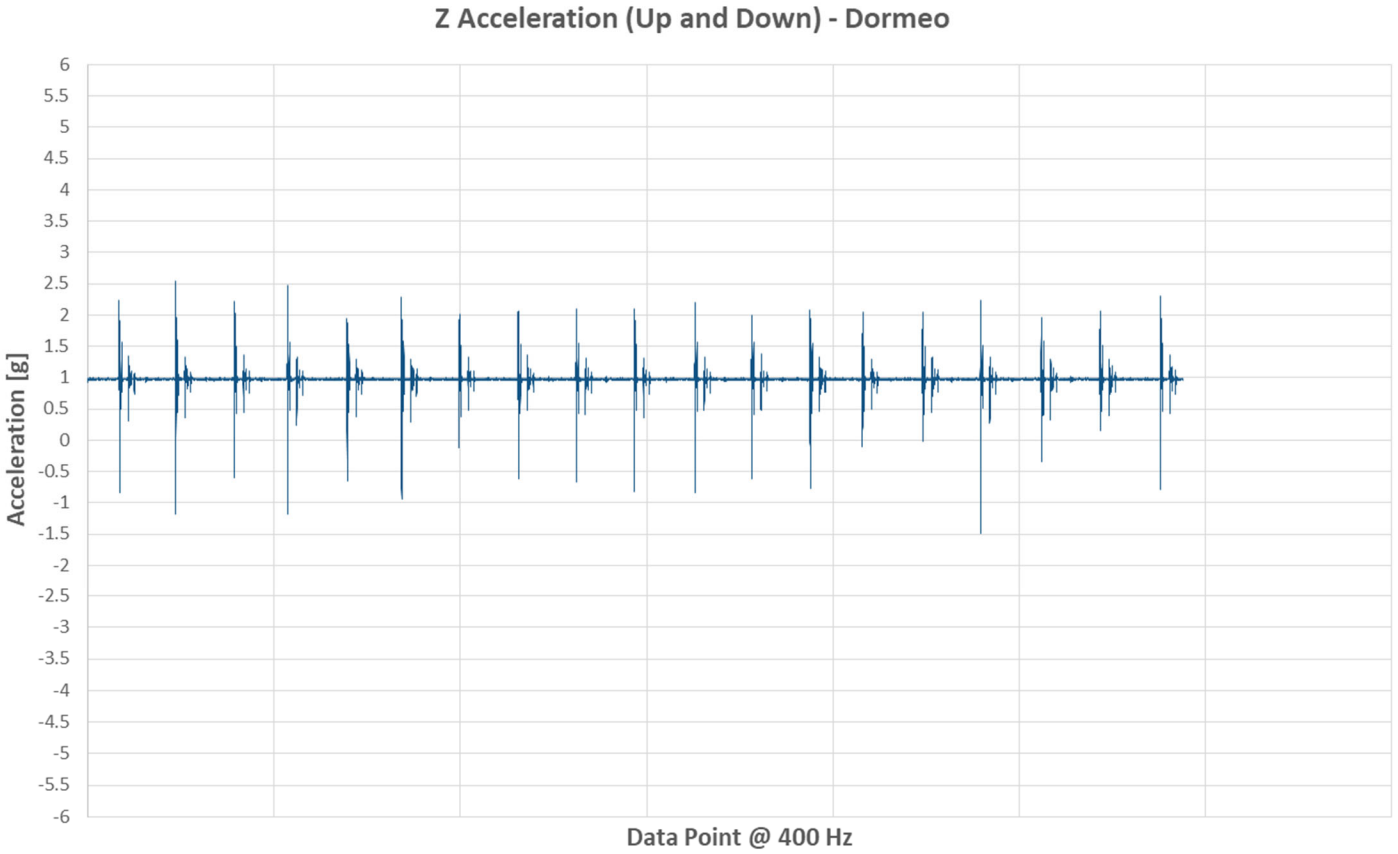

Z Acceleration (Up and Down) - Recore
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – DORMEO

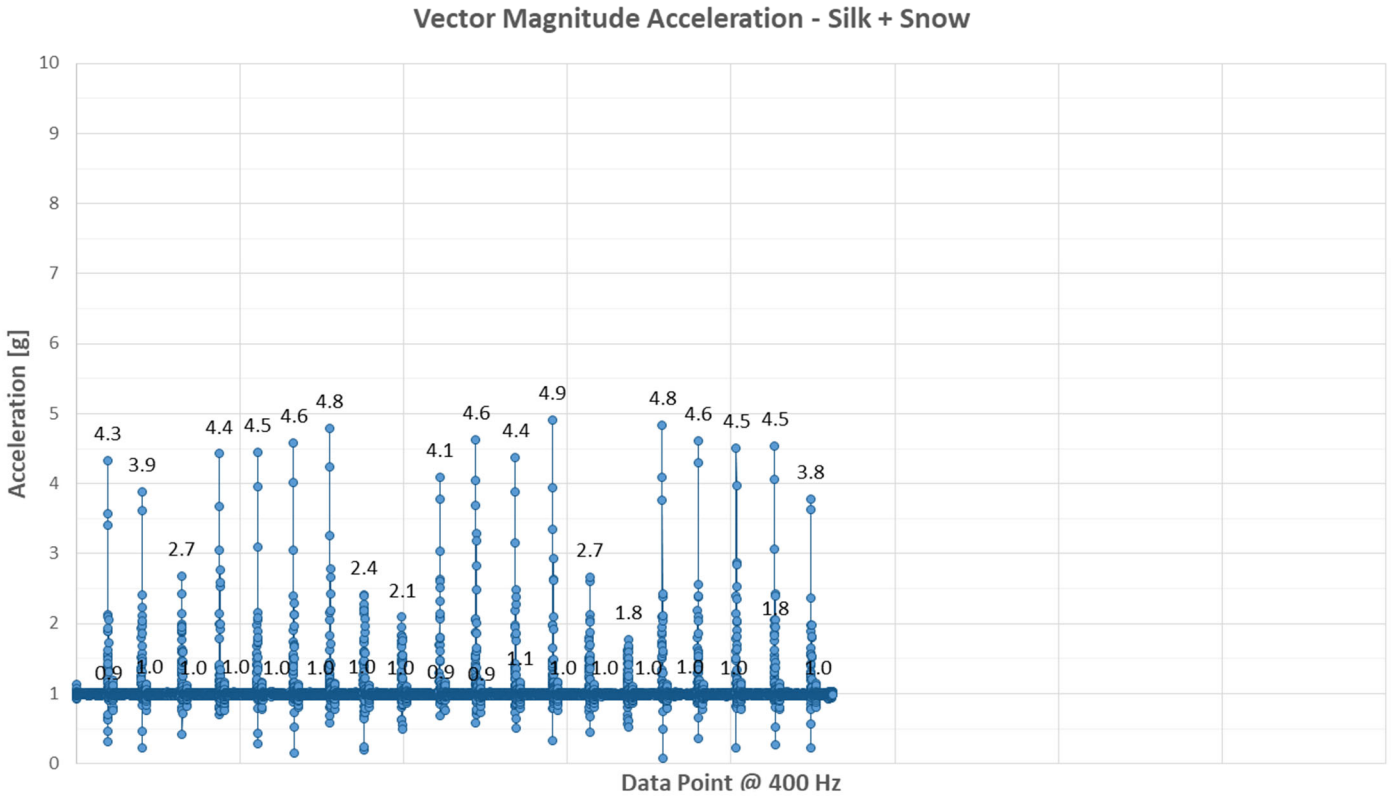


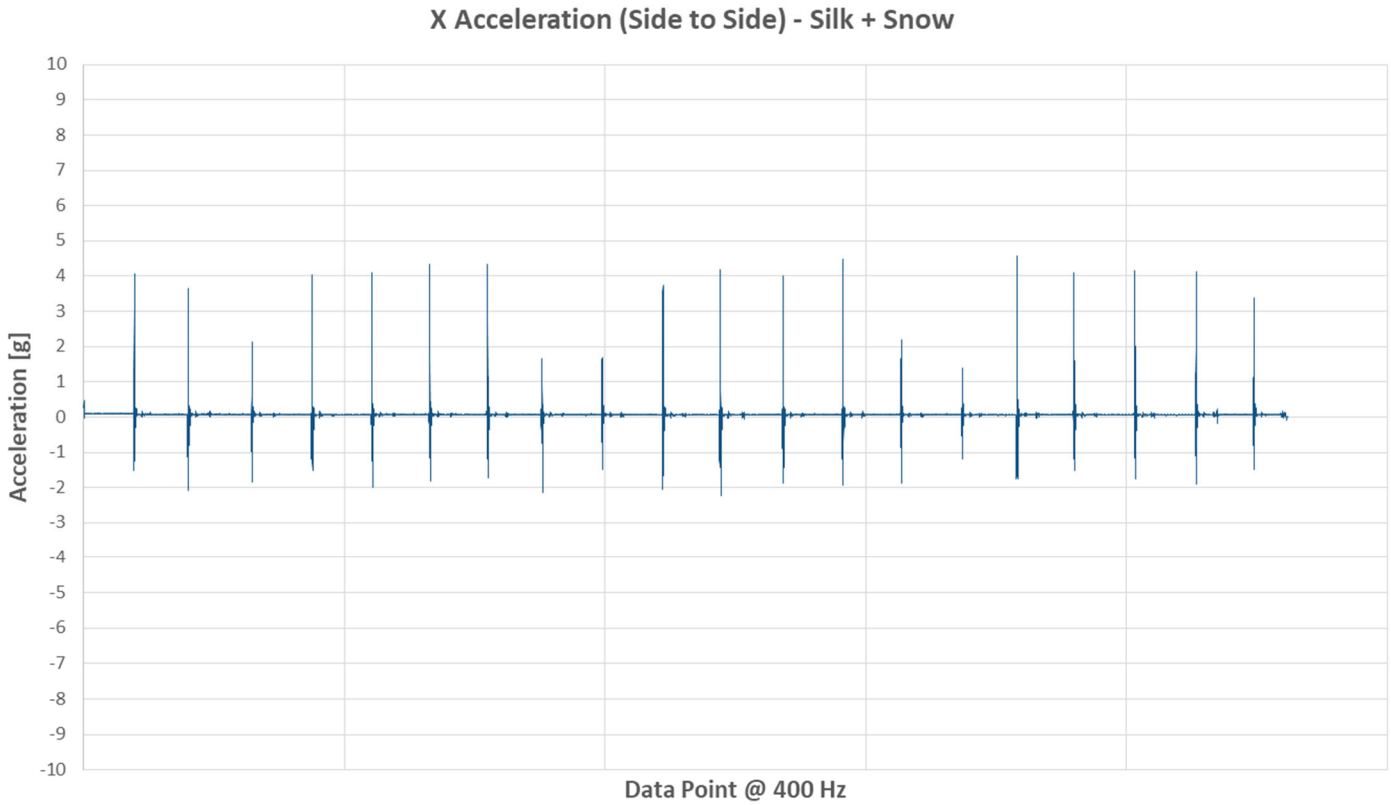


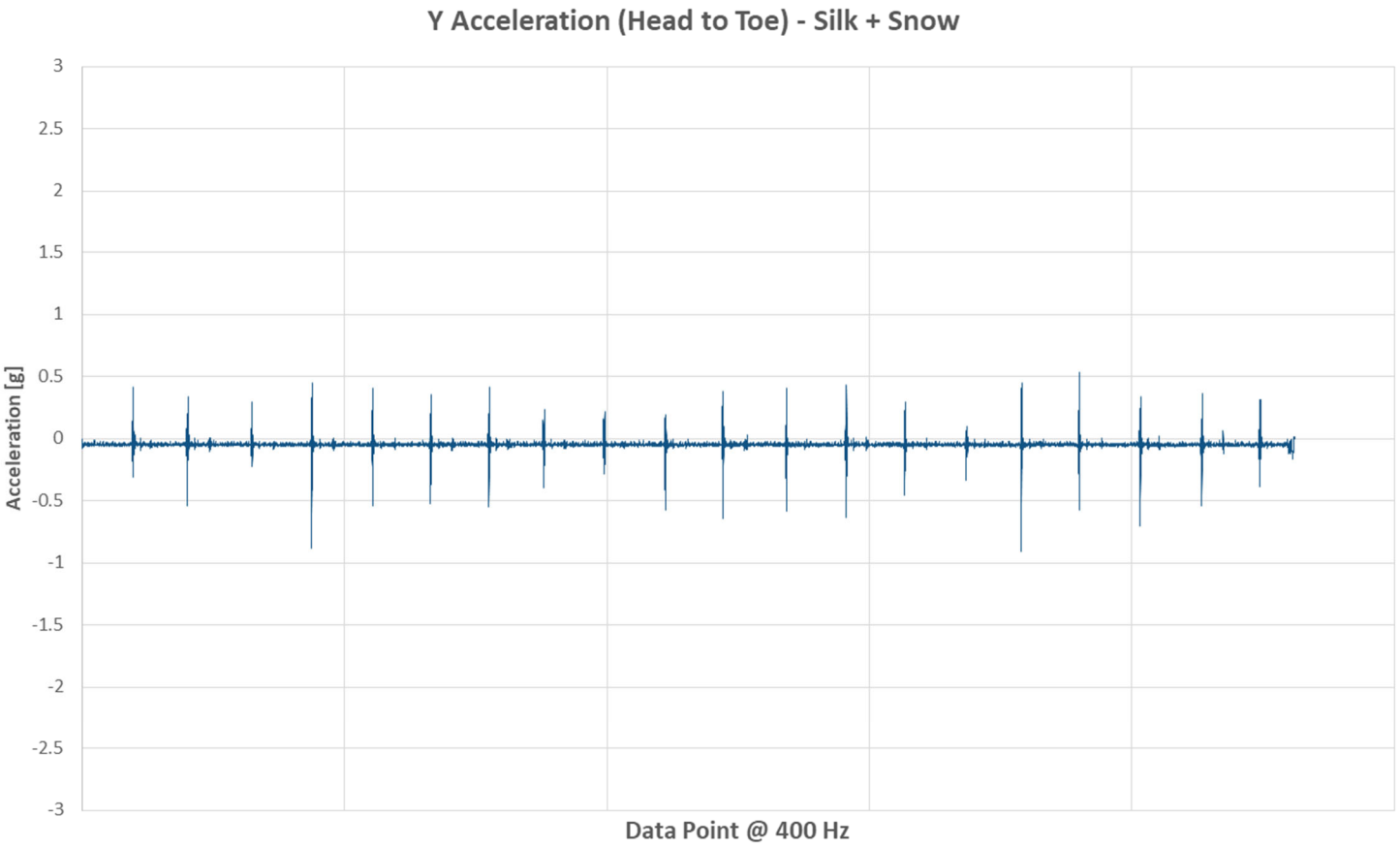

Y Acceleration (Head to Toe) - Dormeo
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

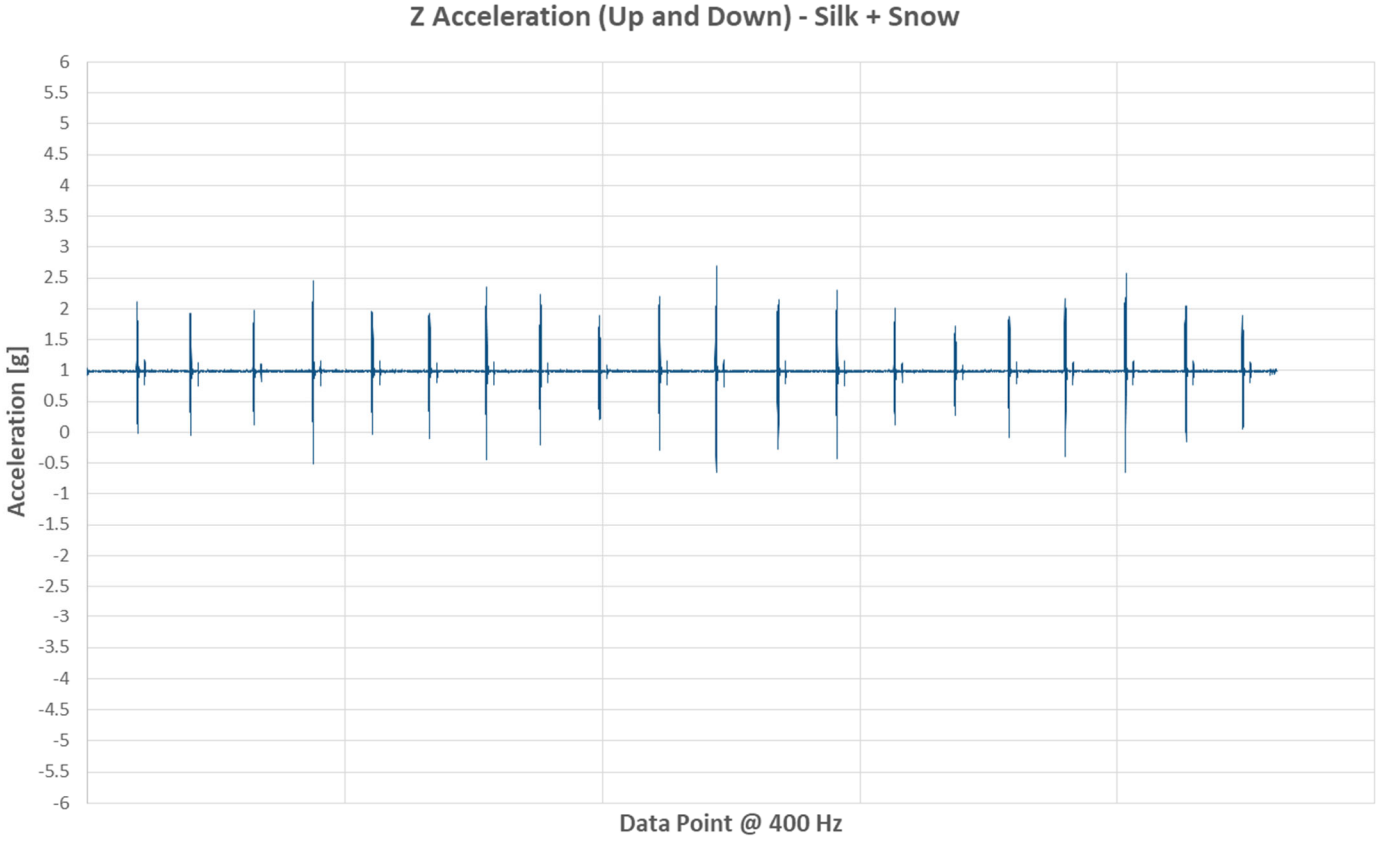

Z Acceleration (Up and Down) - Dormeo
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – SILK + SNOW (V1)

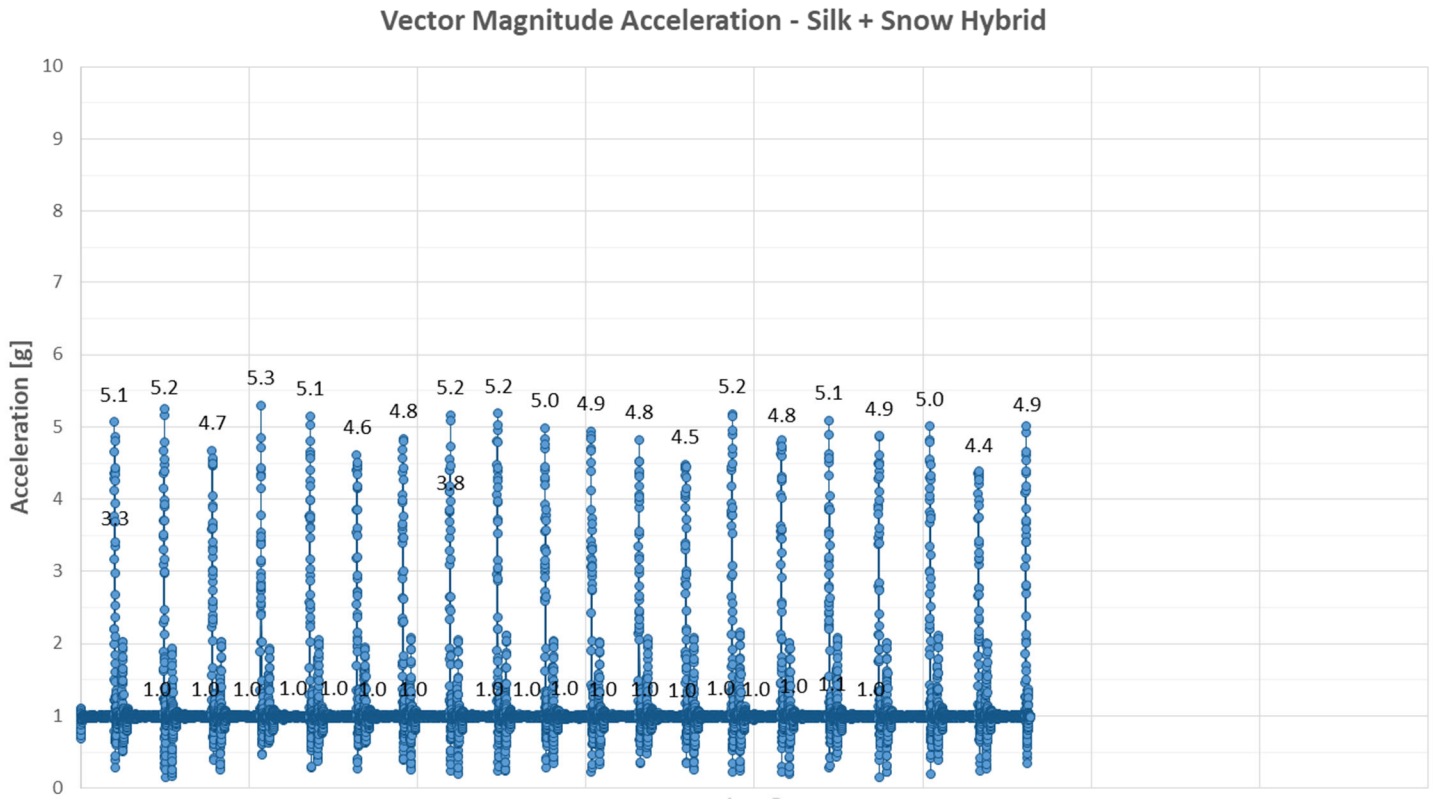


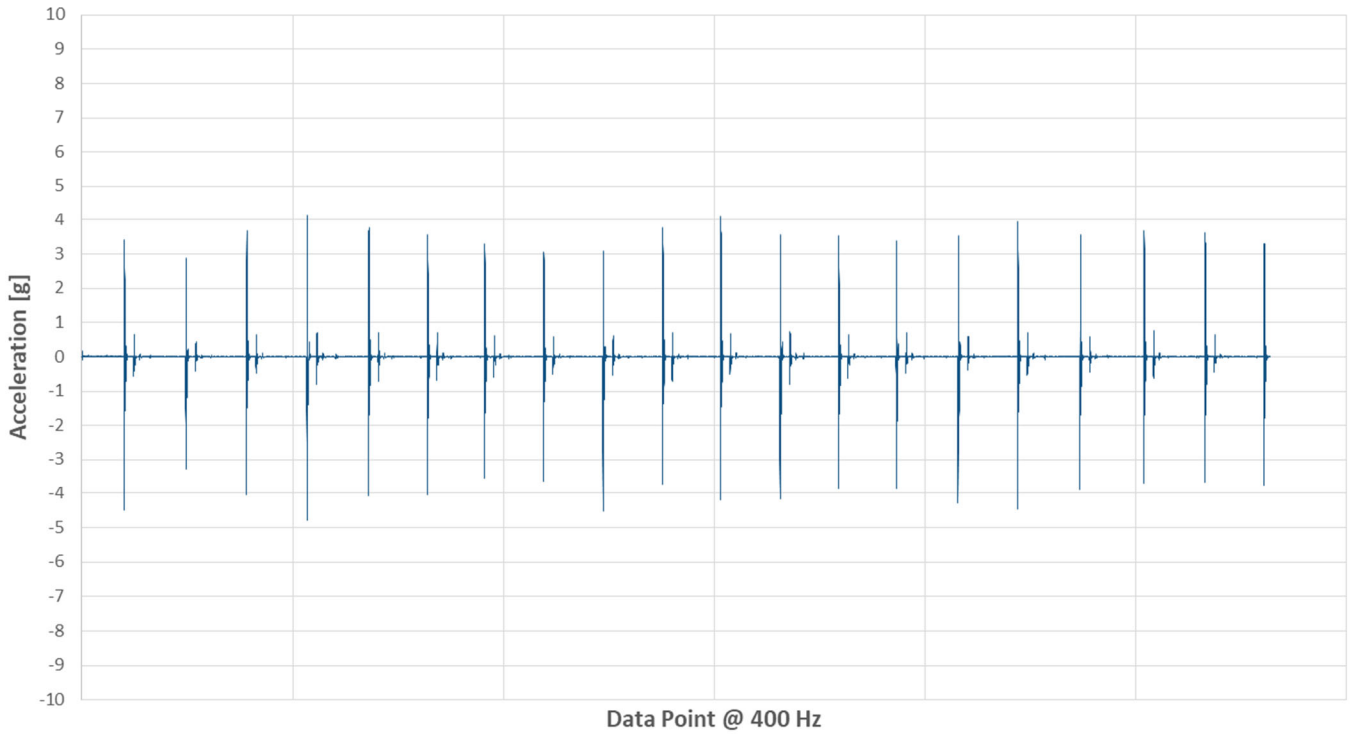


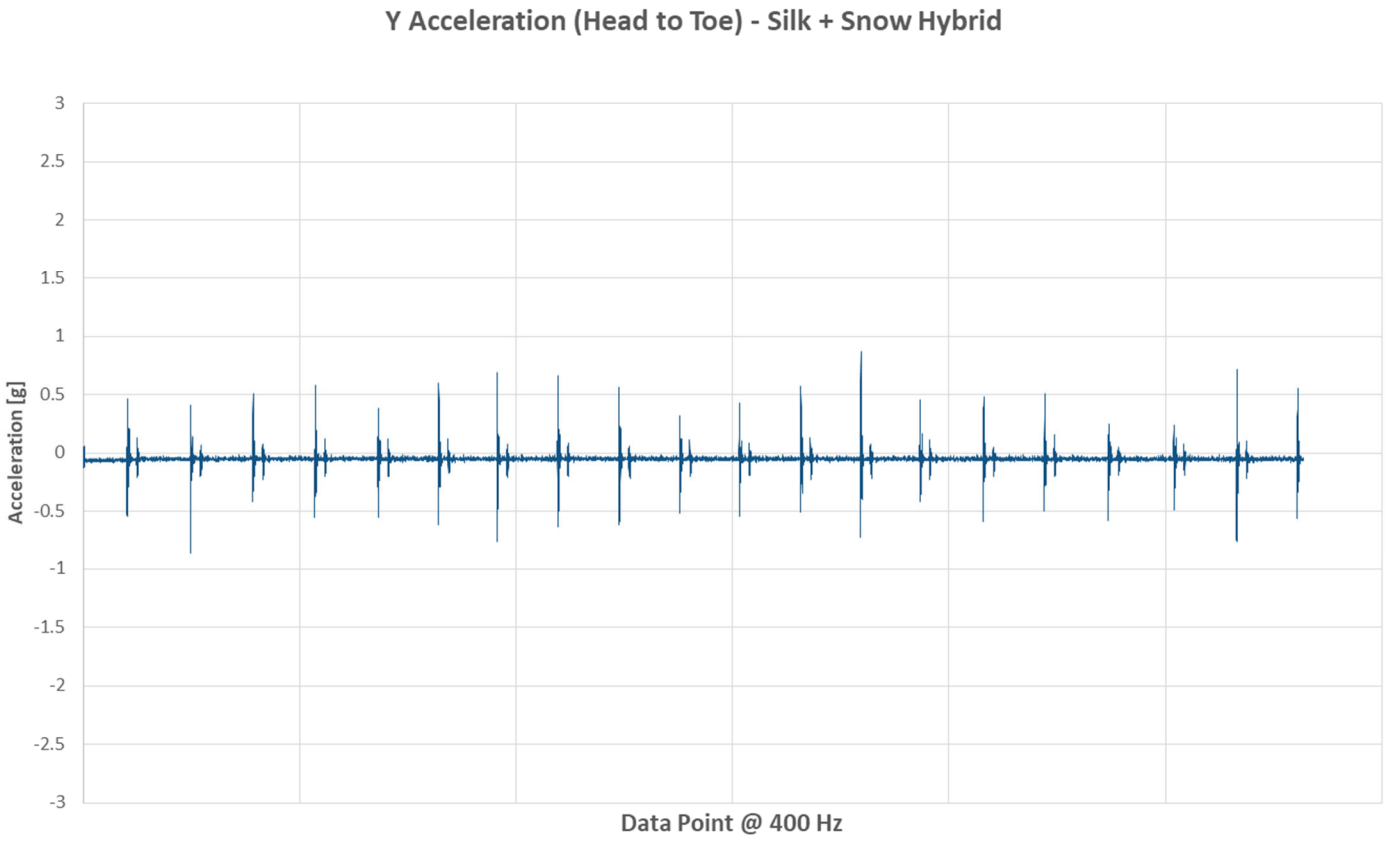

Y Acceleration (Head to Toe) - Silk + Snow
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

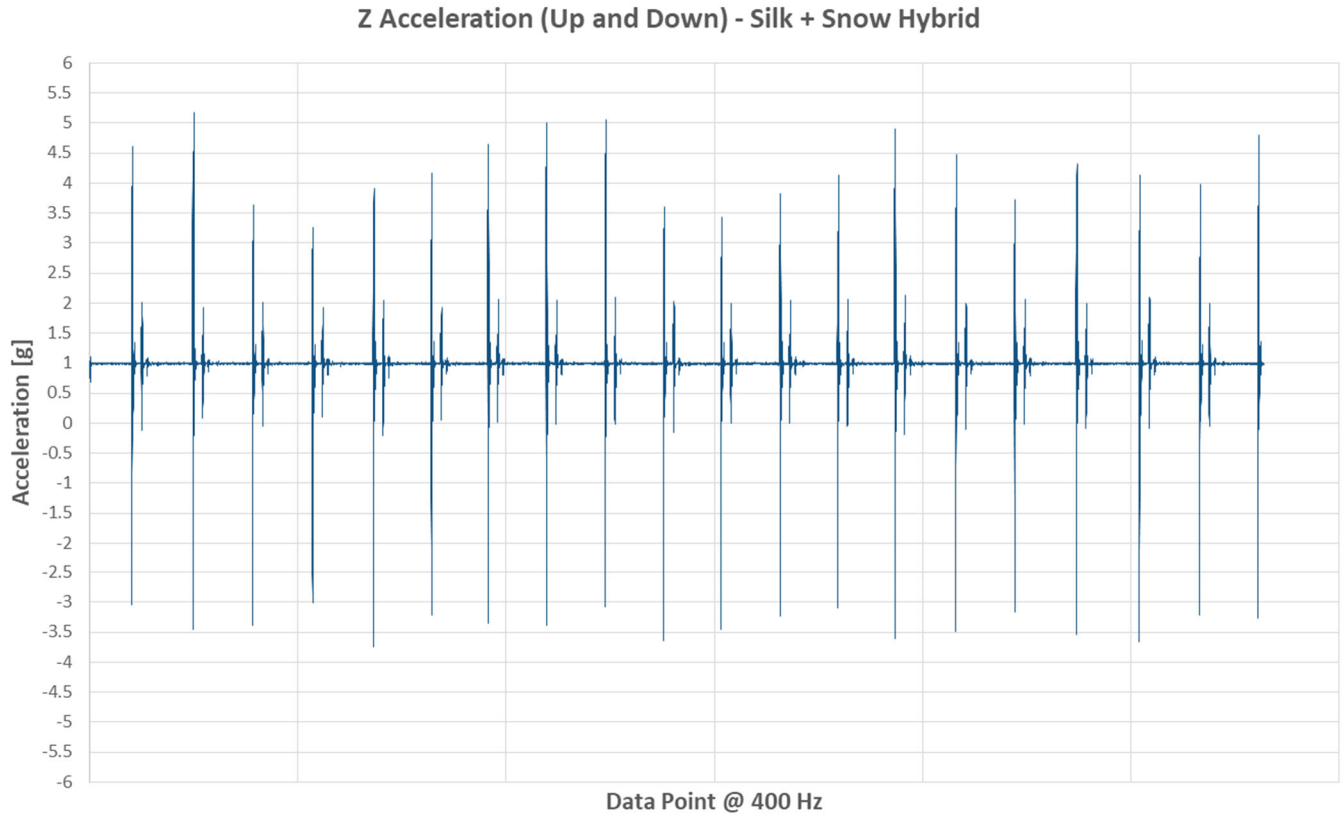

Z Acceleration (Up and Down) - Silk + Snow
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – SILK + SNOW HYBRID (V1)

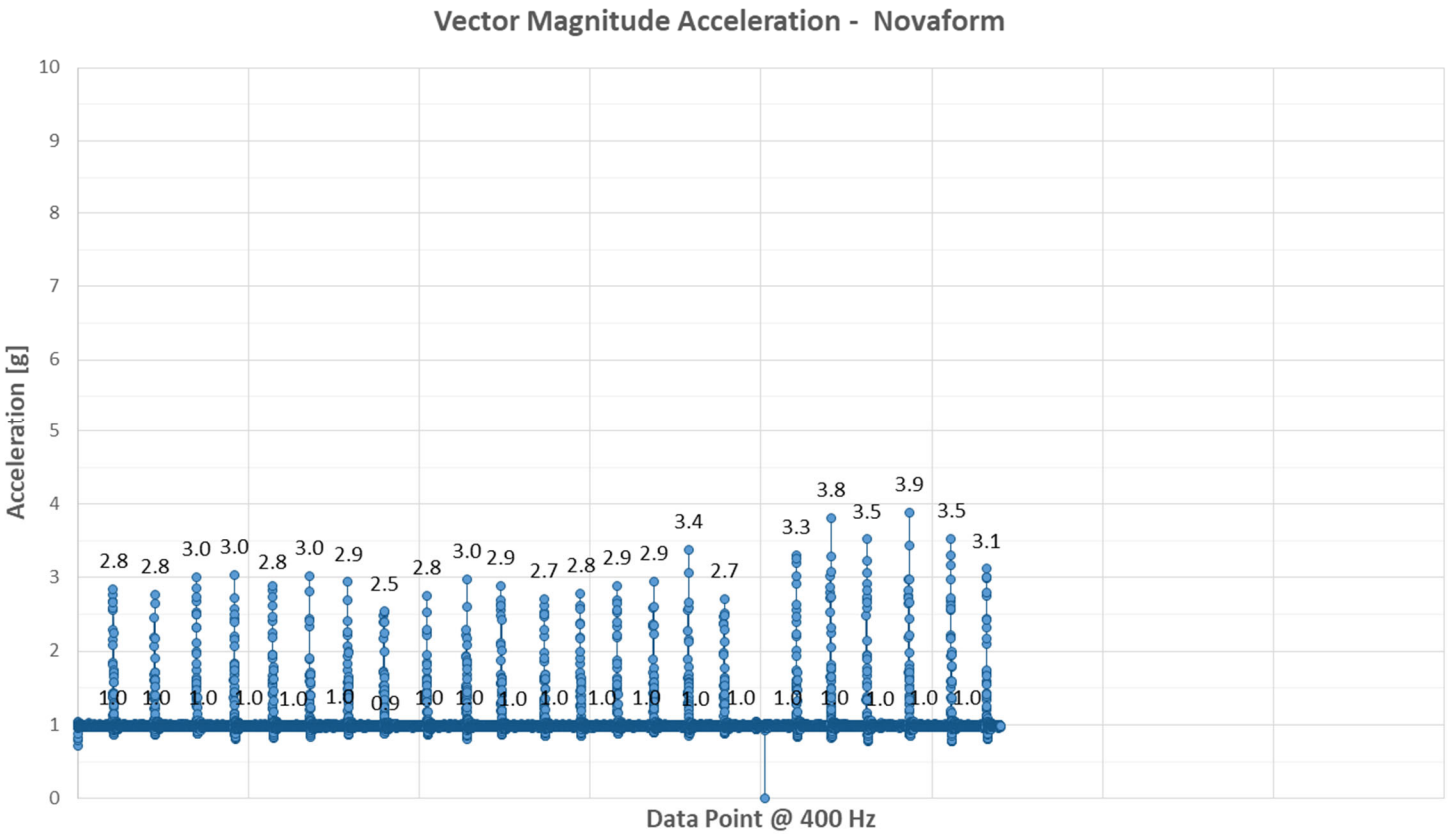


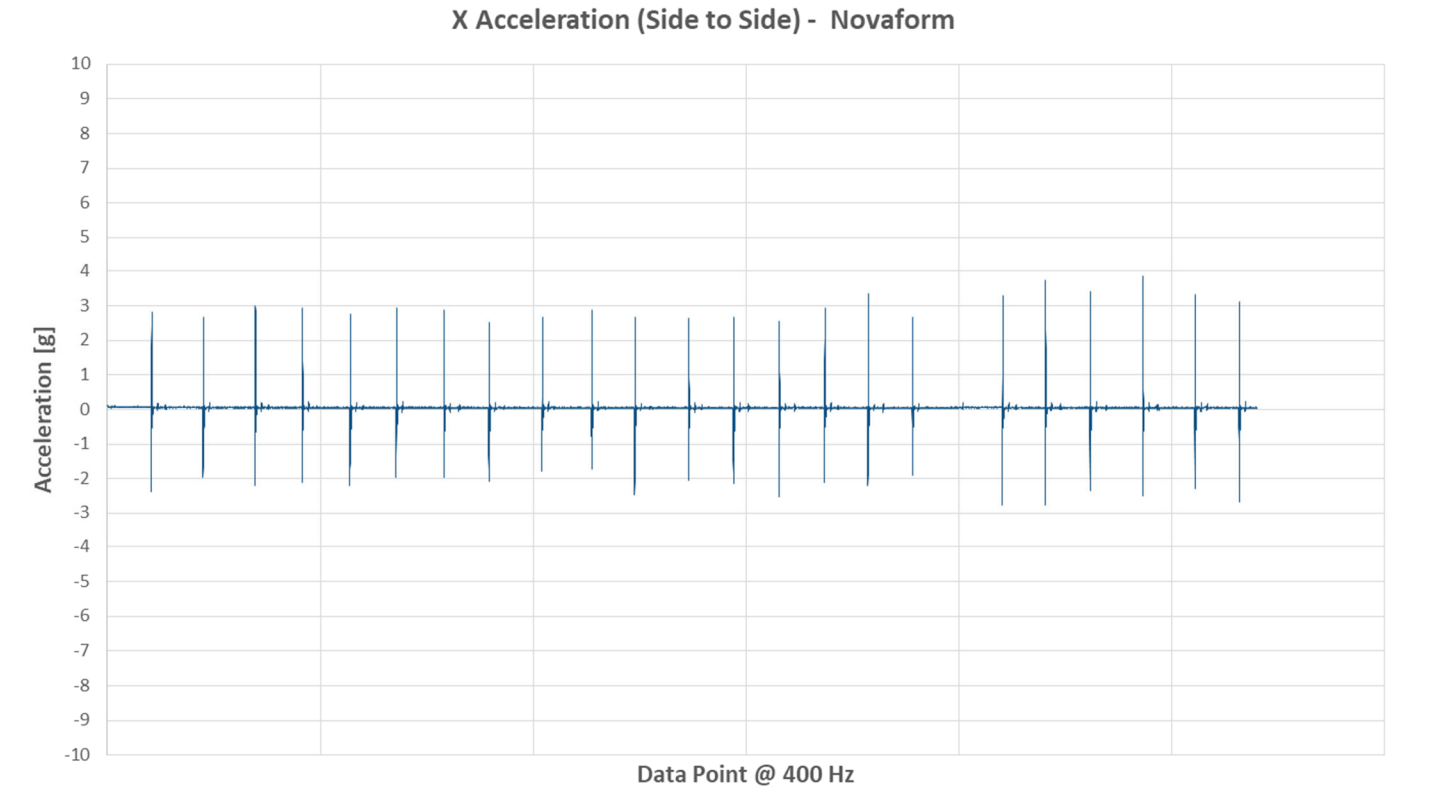


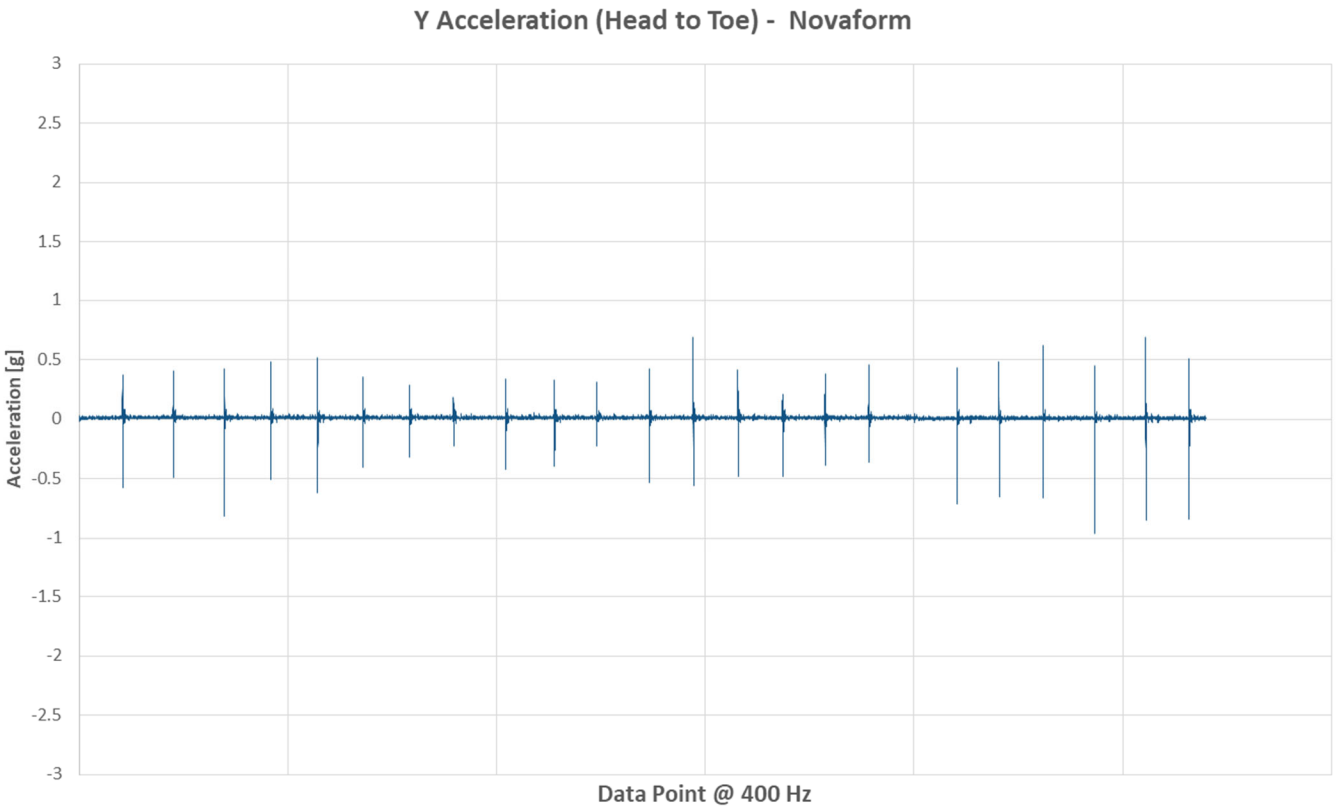

Y Acceleration (Head to Toe) - Silk + Snow Hybrid
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

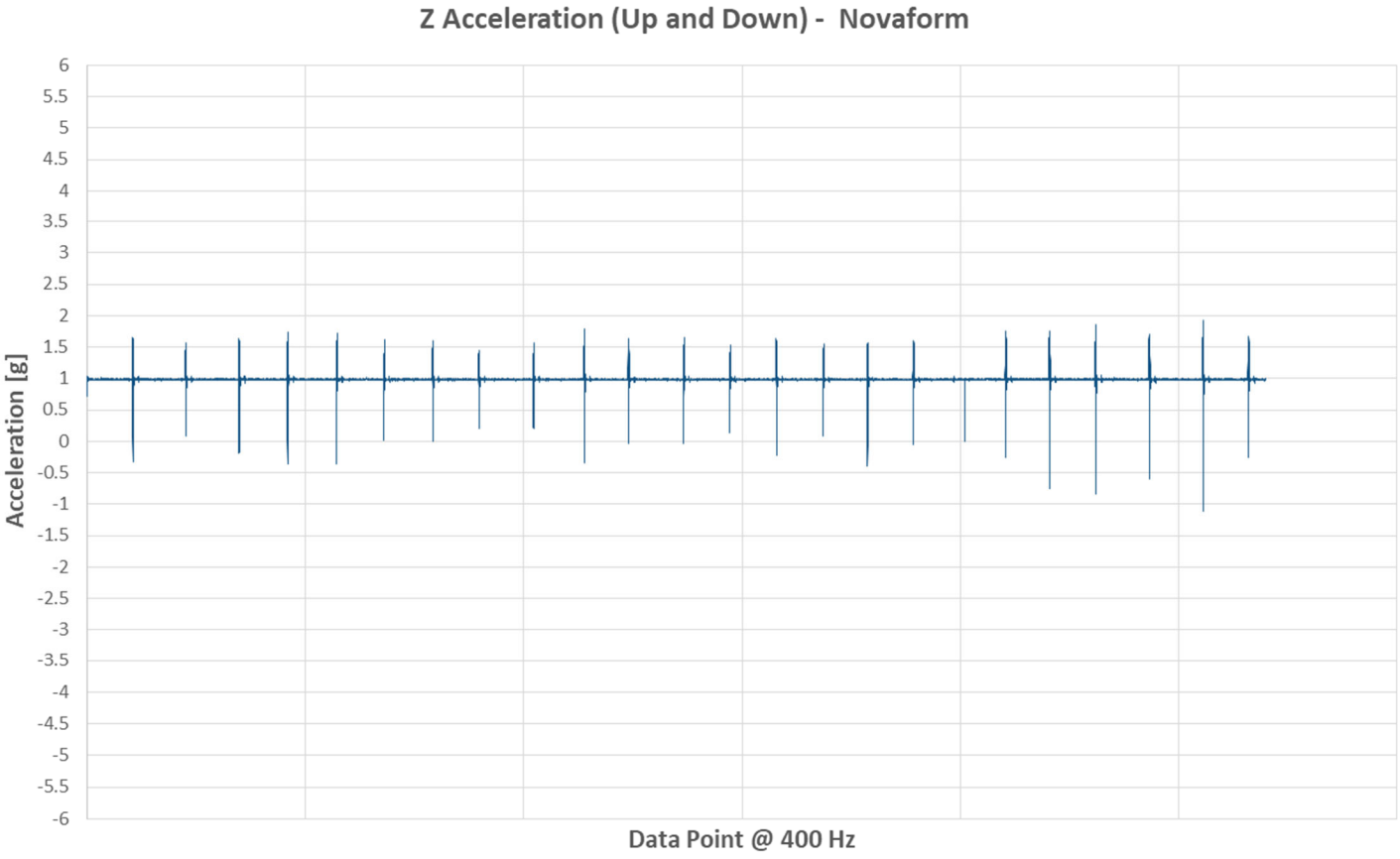

Z Acceleration (Up and Down) - Silk + Snow Hybrid
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – NOVAFORM

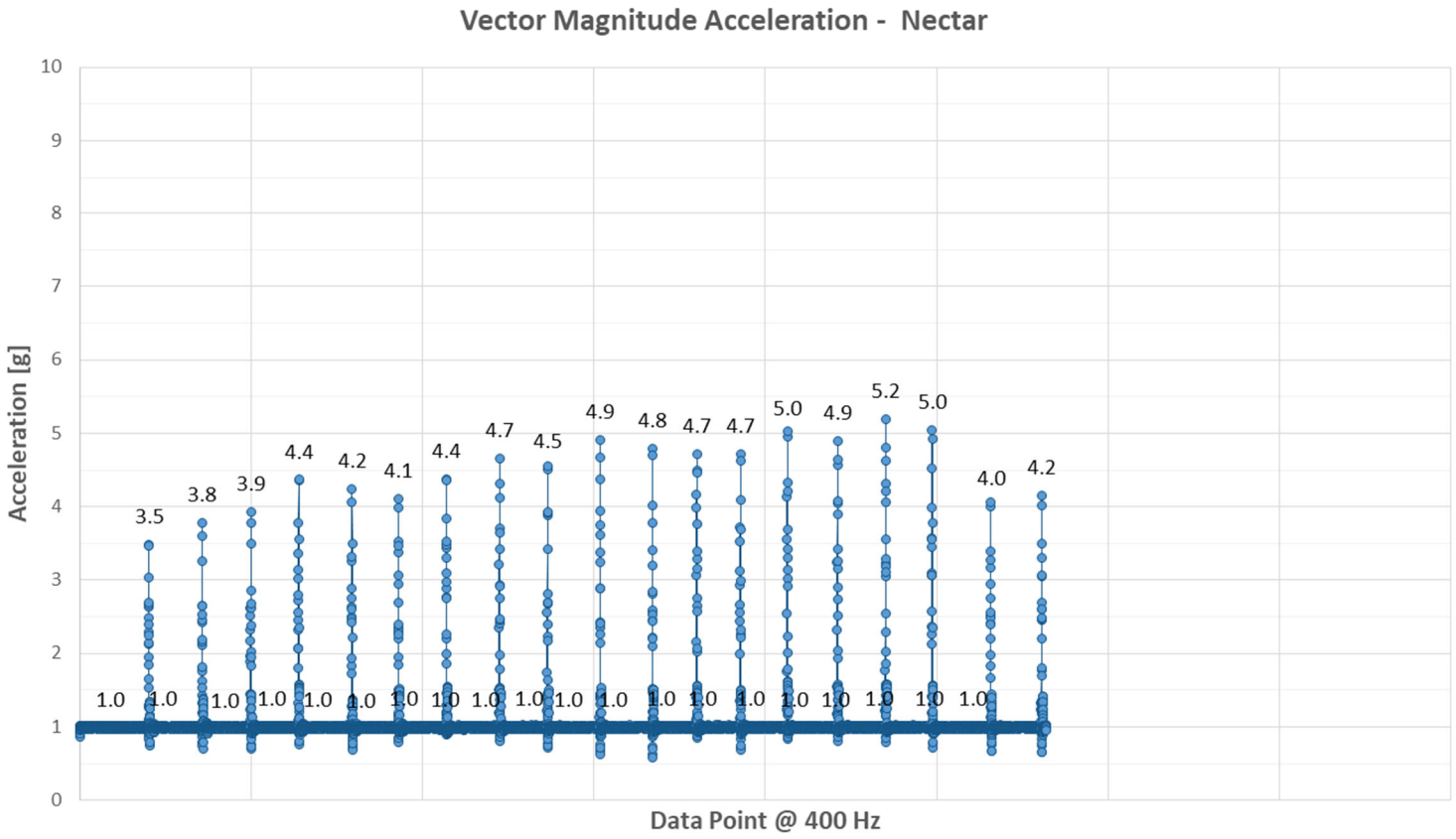


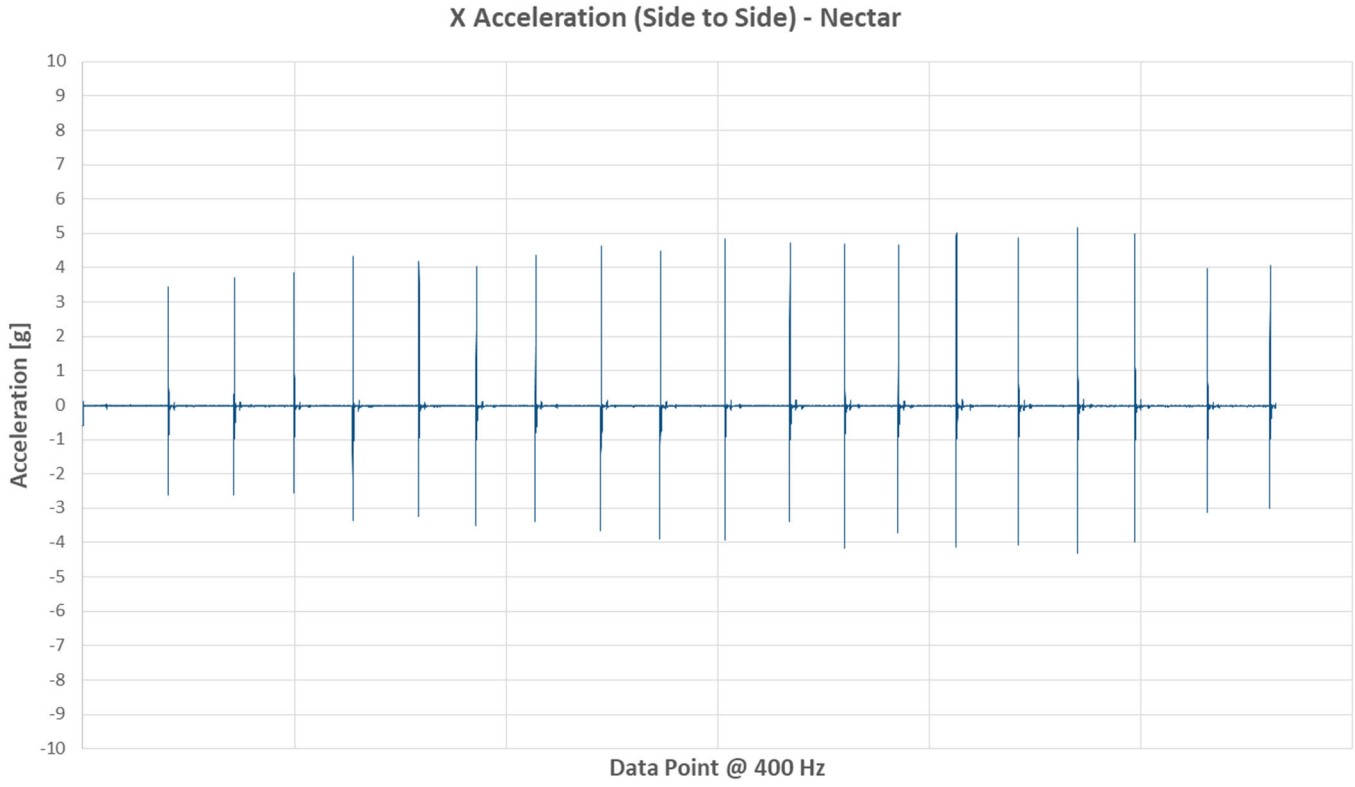


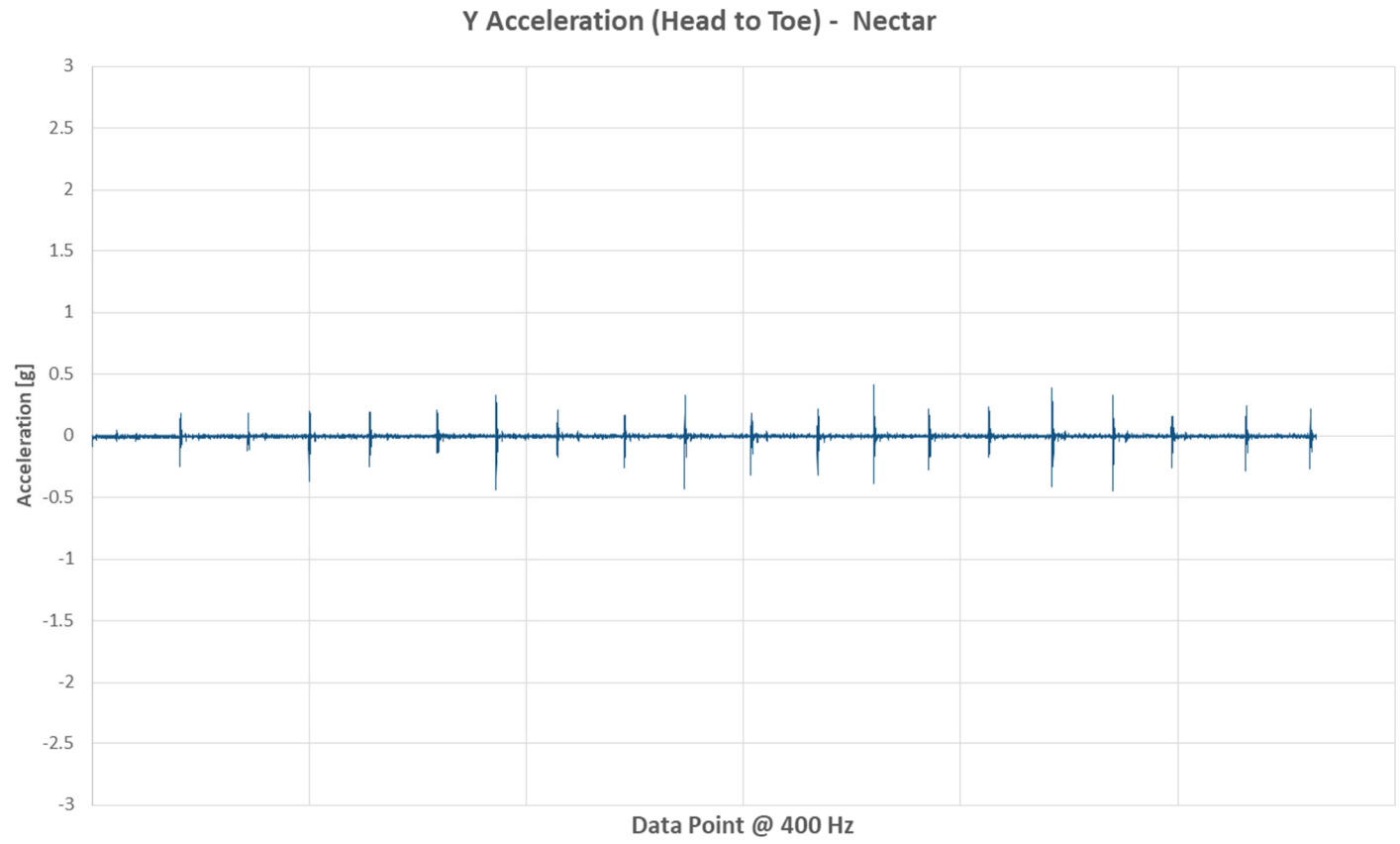

Y Acceleration (Head to Toe) - Novaform
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

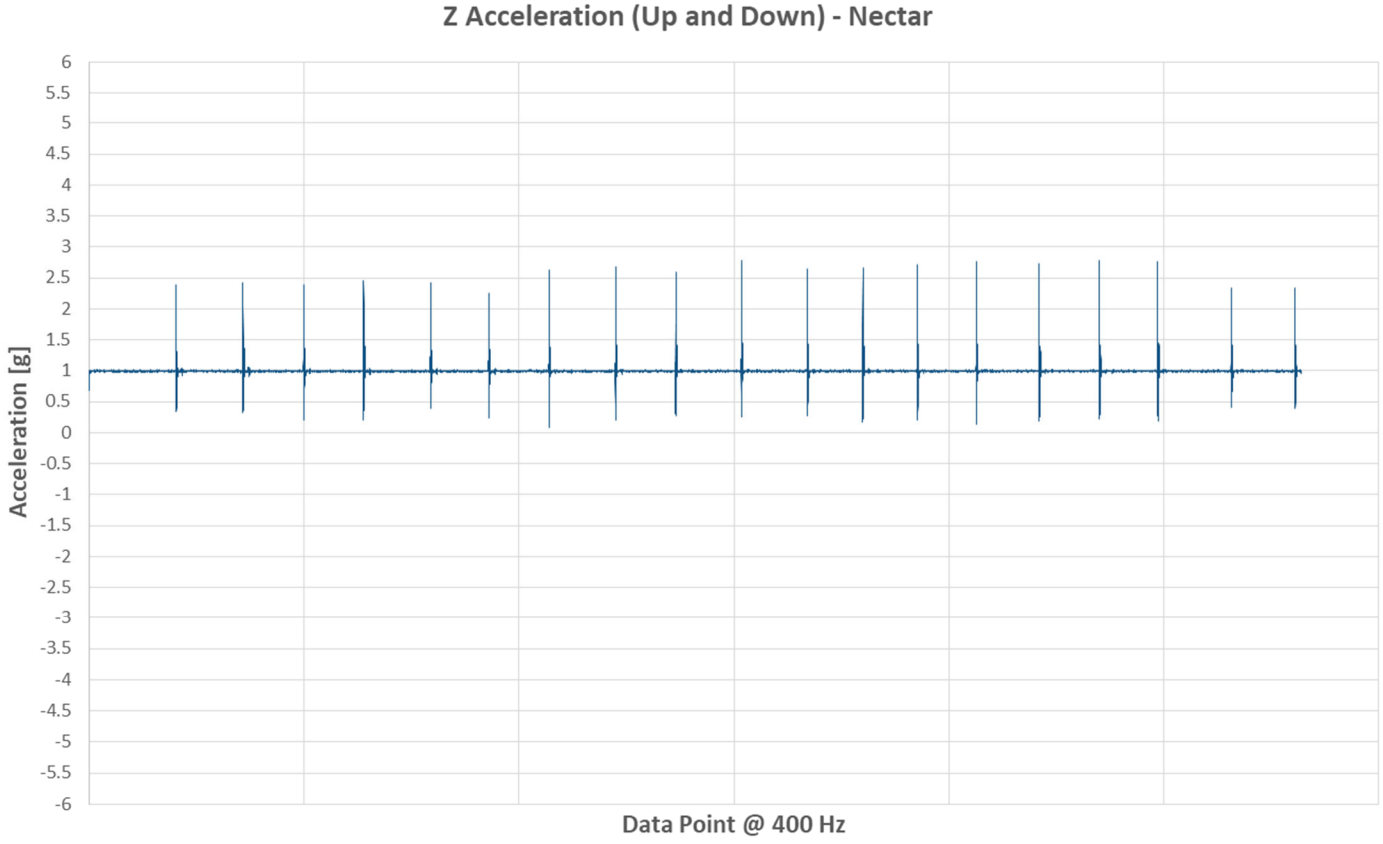

Z Acceleration (Up and Down) - Novaform
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – NECTAR

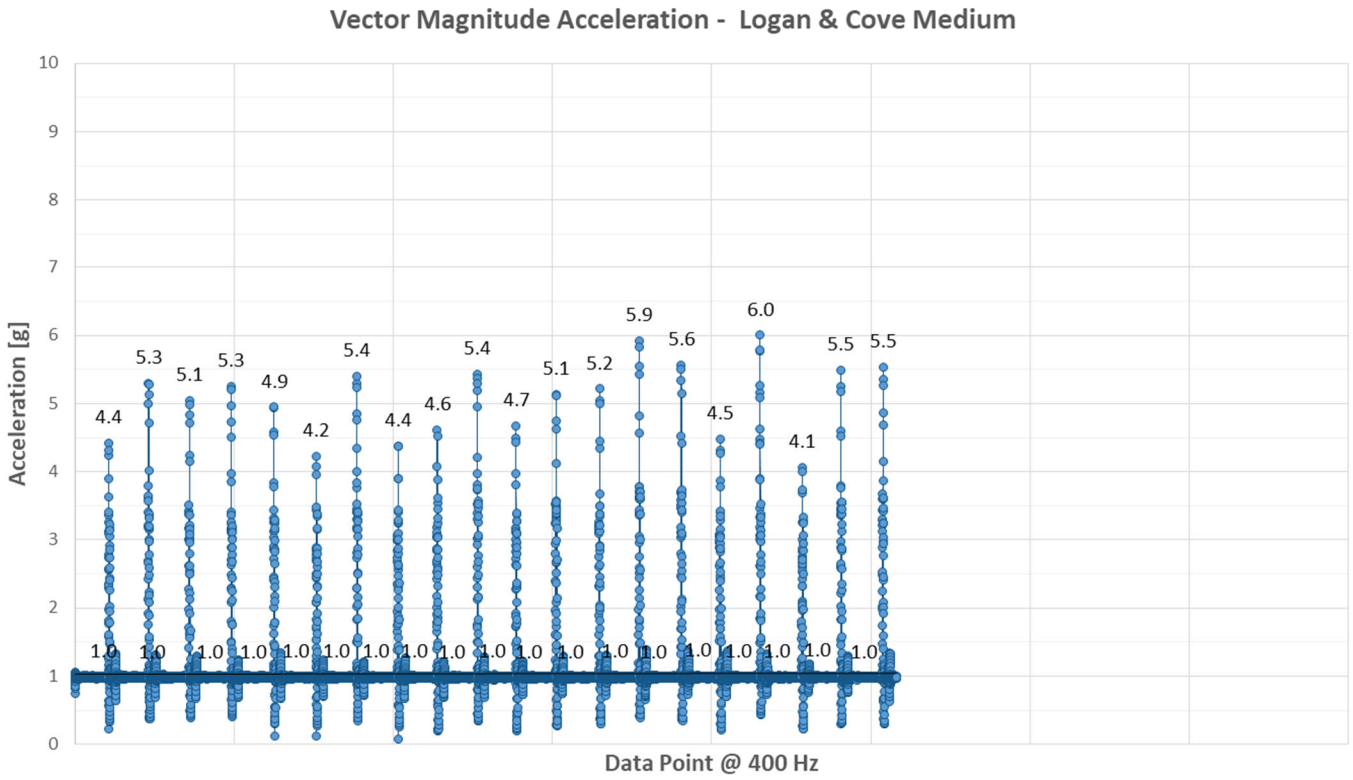


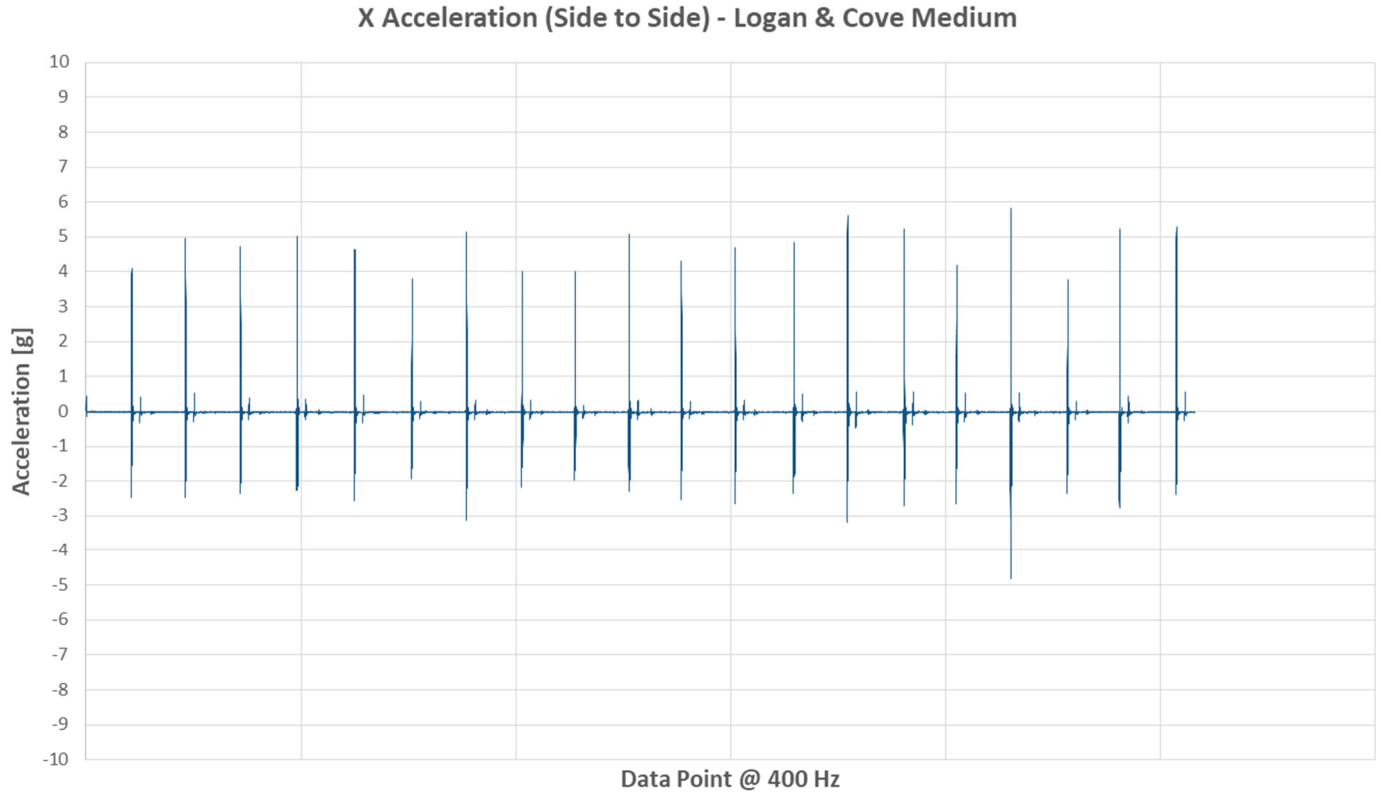


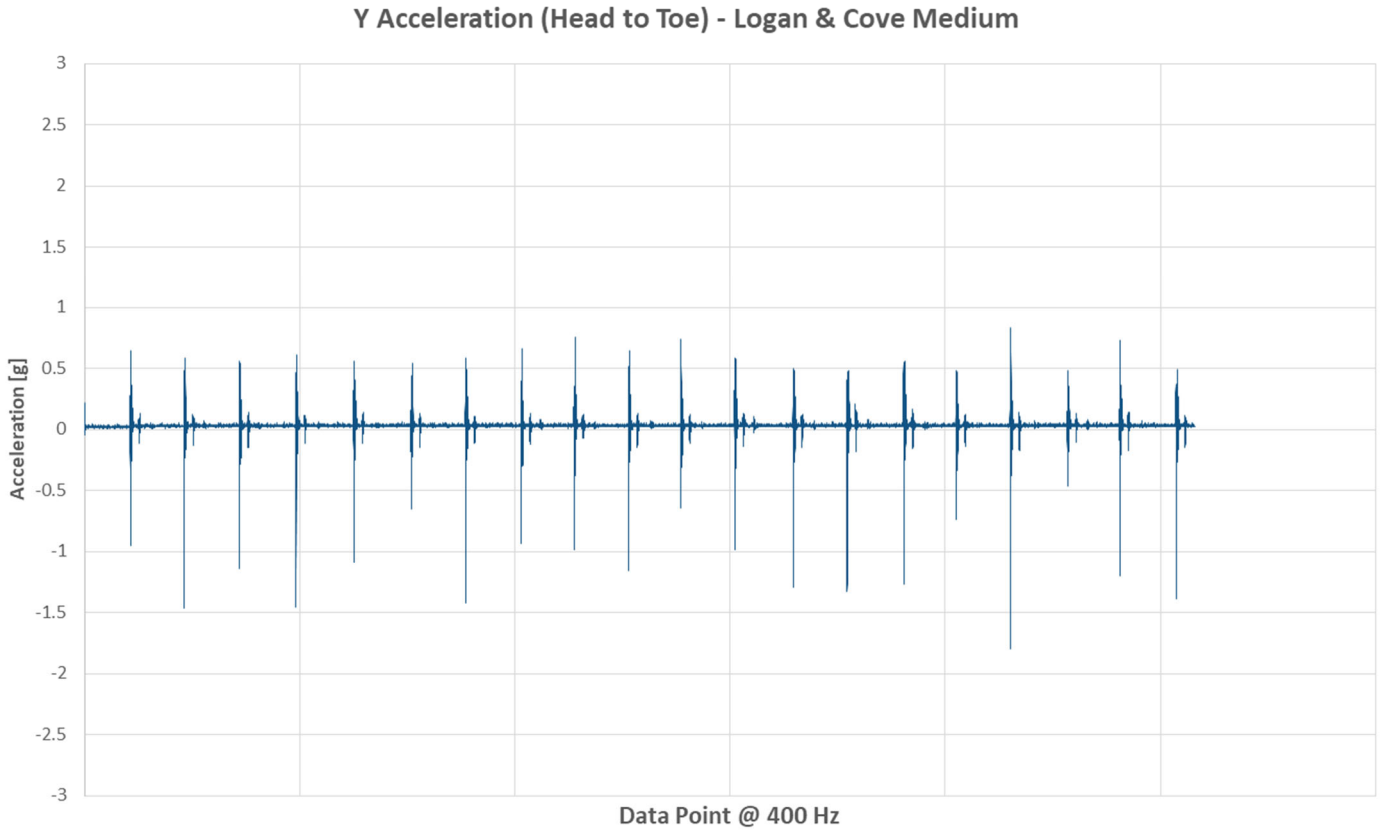

Y Acceleration (Head to Toe) - Nectar
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

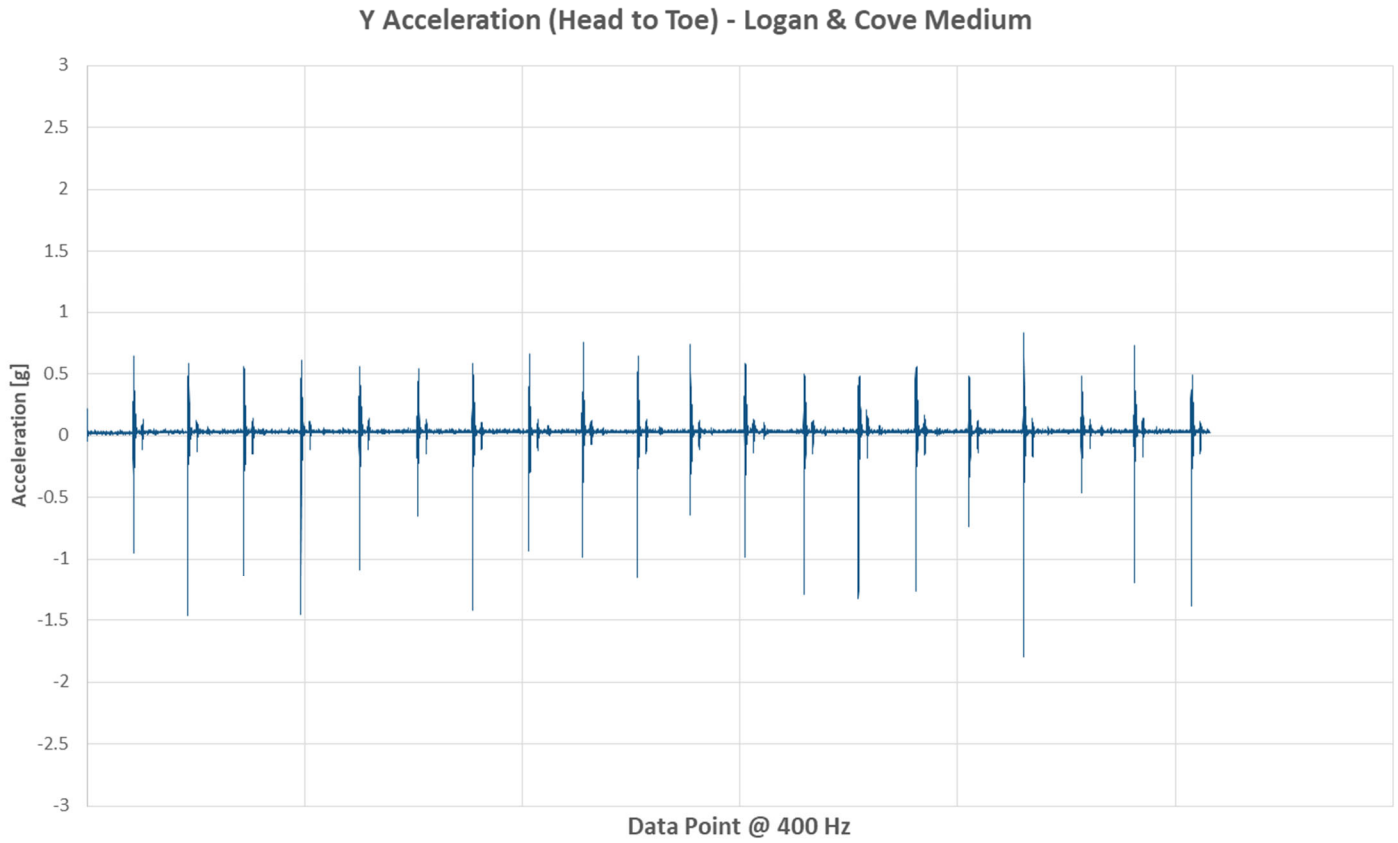

Z Acceleration (Up and Down) - Nectar
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – LOGAN & COVE MEDIUM

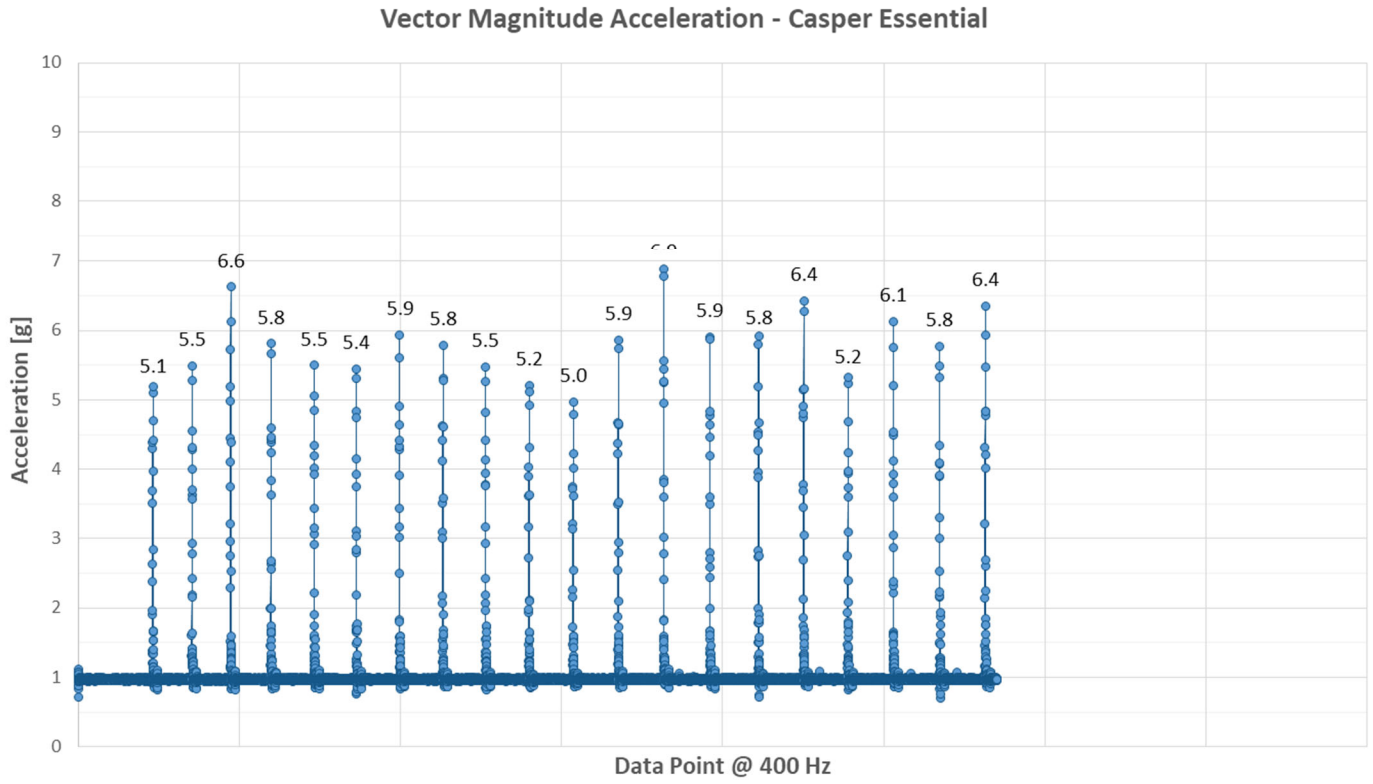


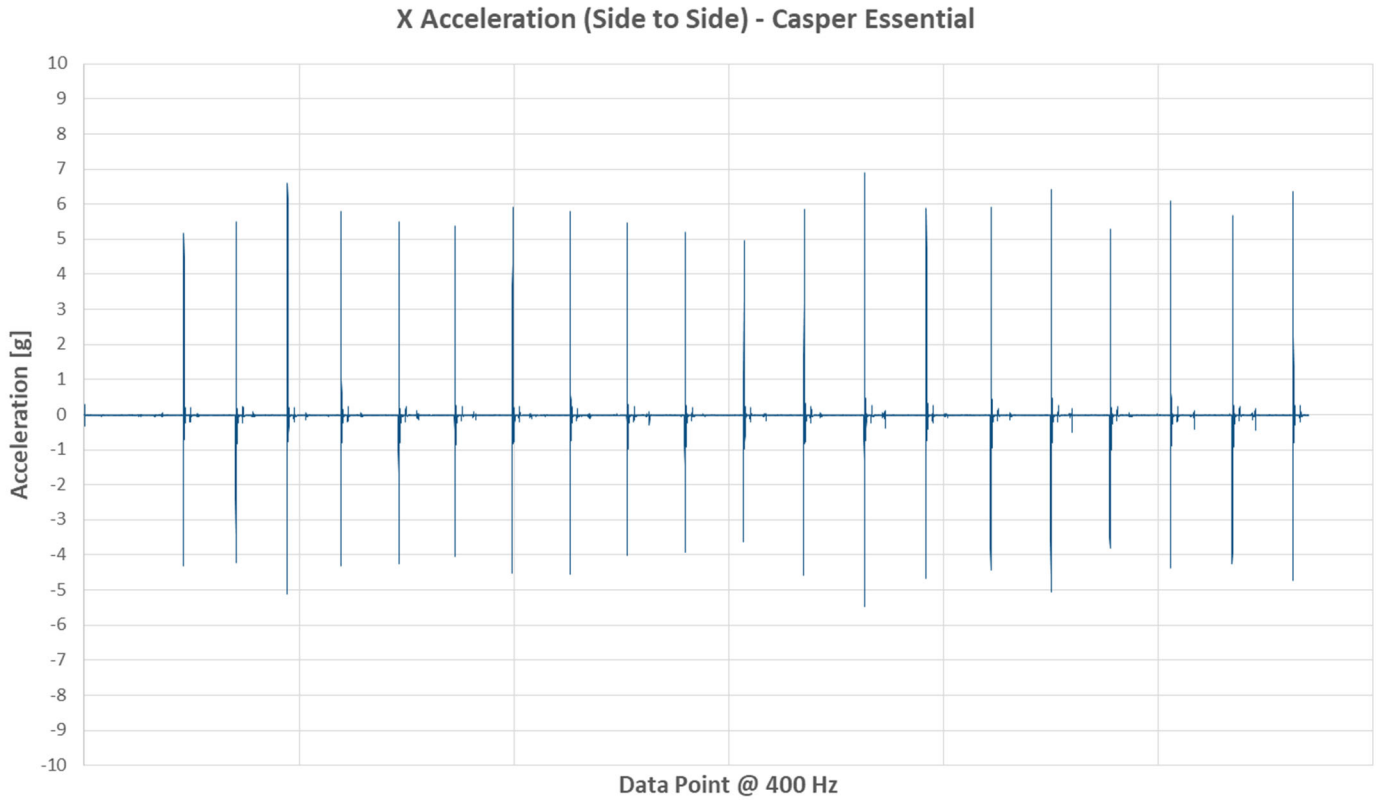


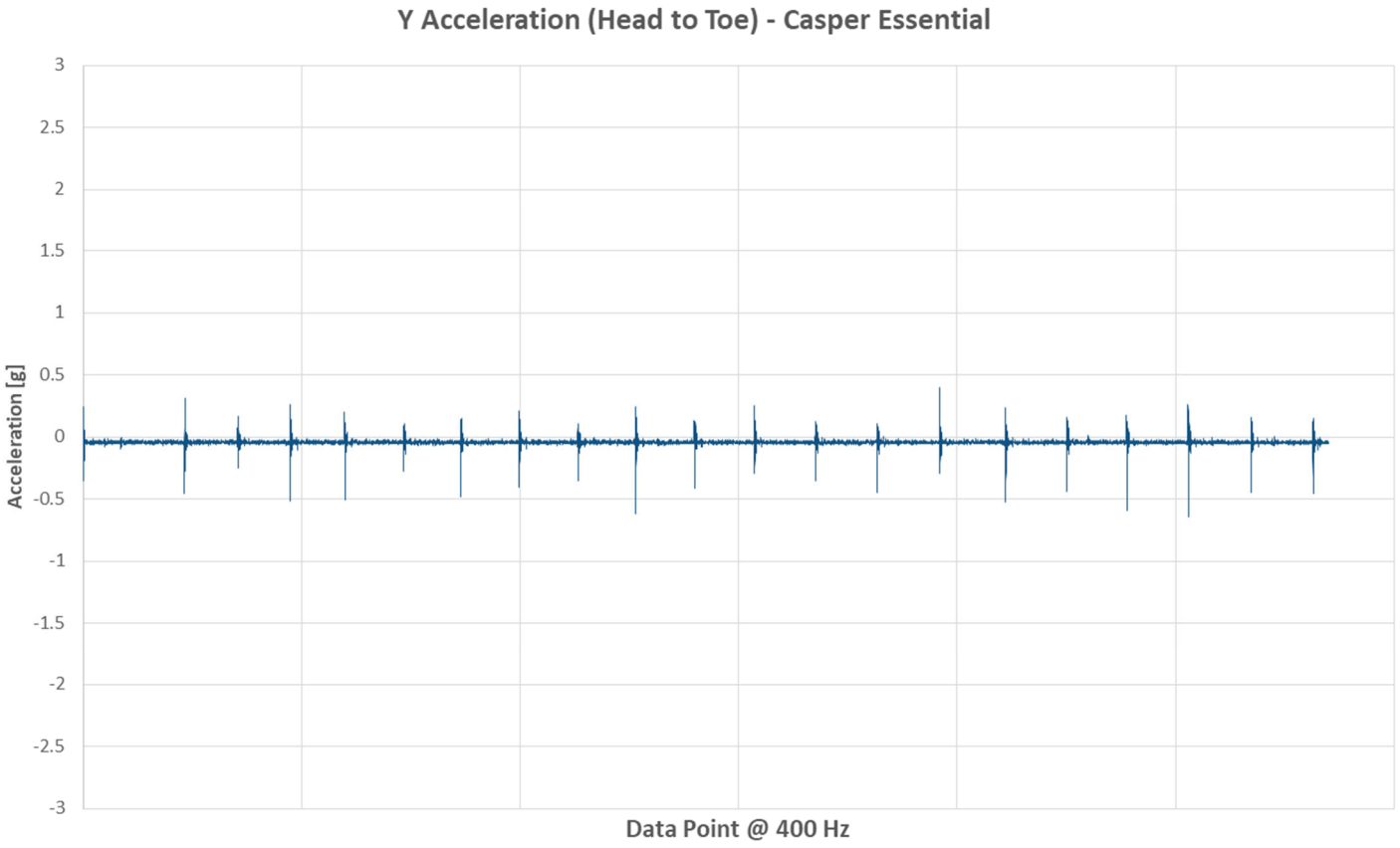

Y Acceleration (Head to Toe) - Logan & Cove Medium
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

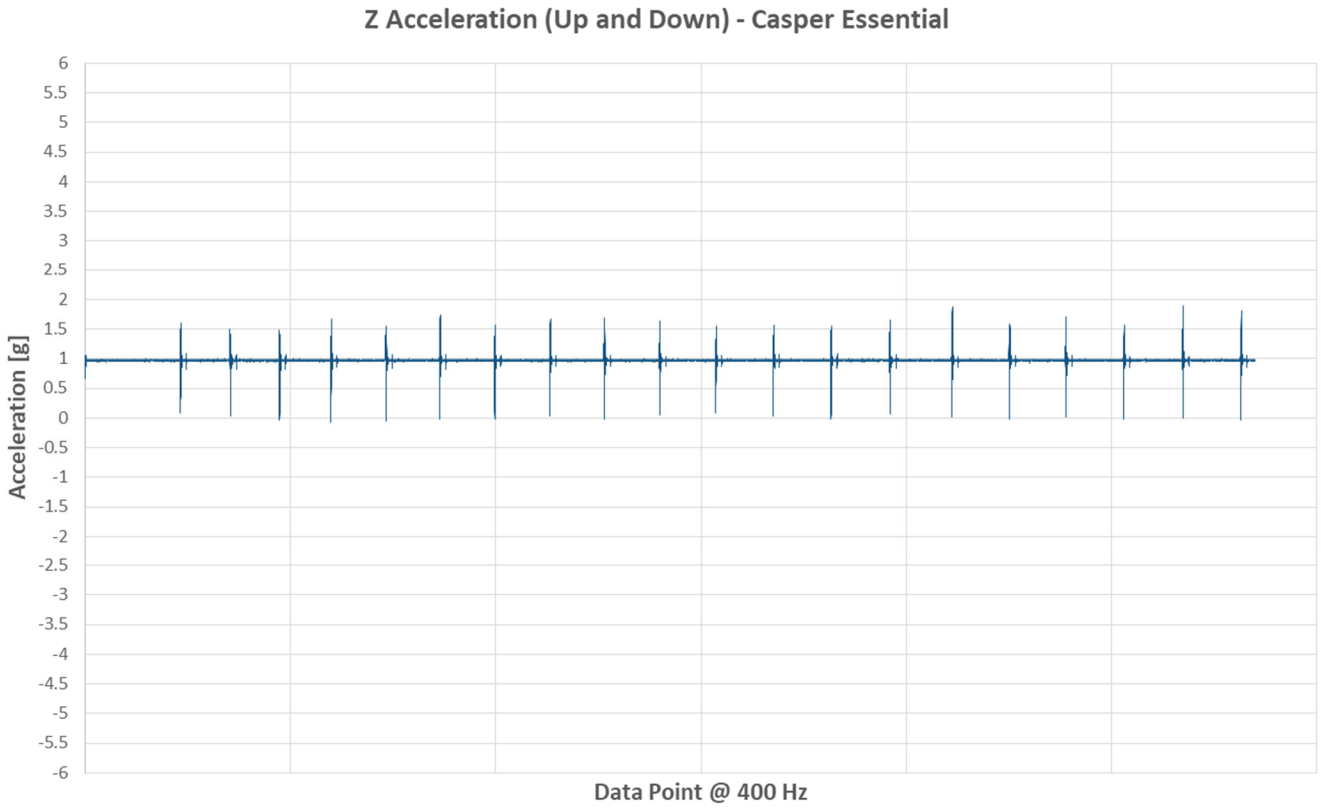

Y Acceleration (Head to Toe) - Logan & Cove Medium
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

TEST 3 – CASPER ESSENTIAL

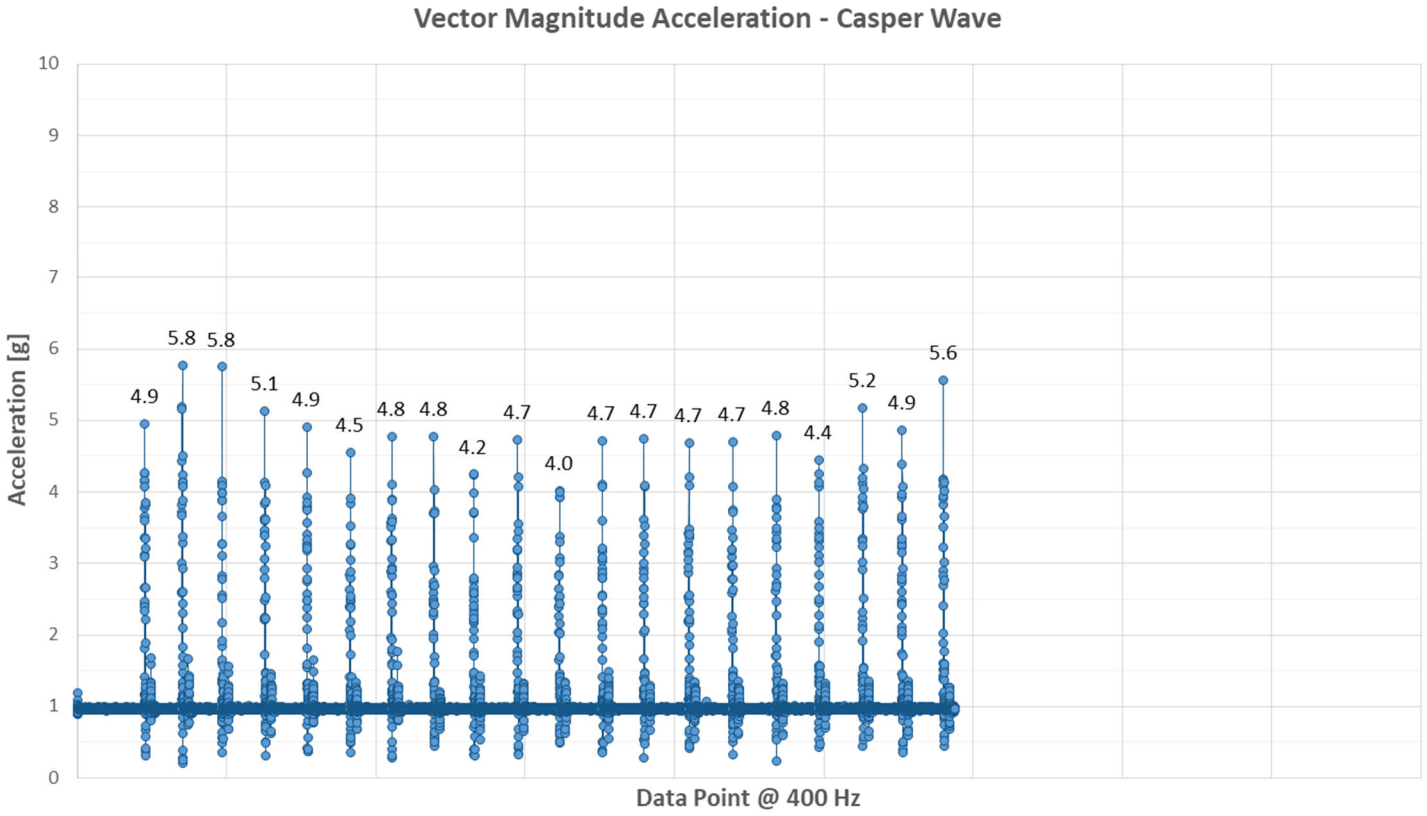


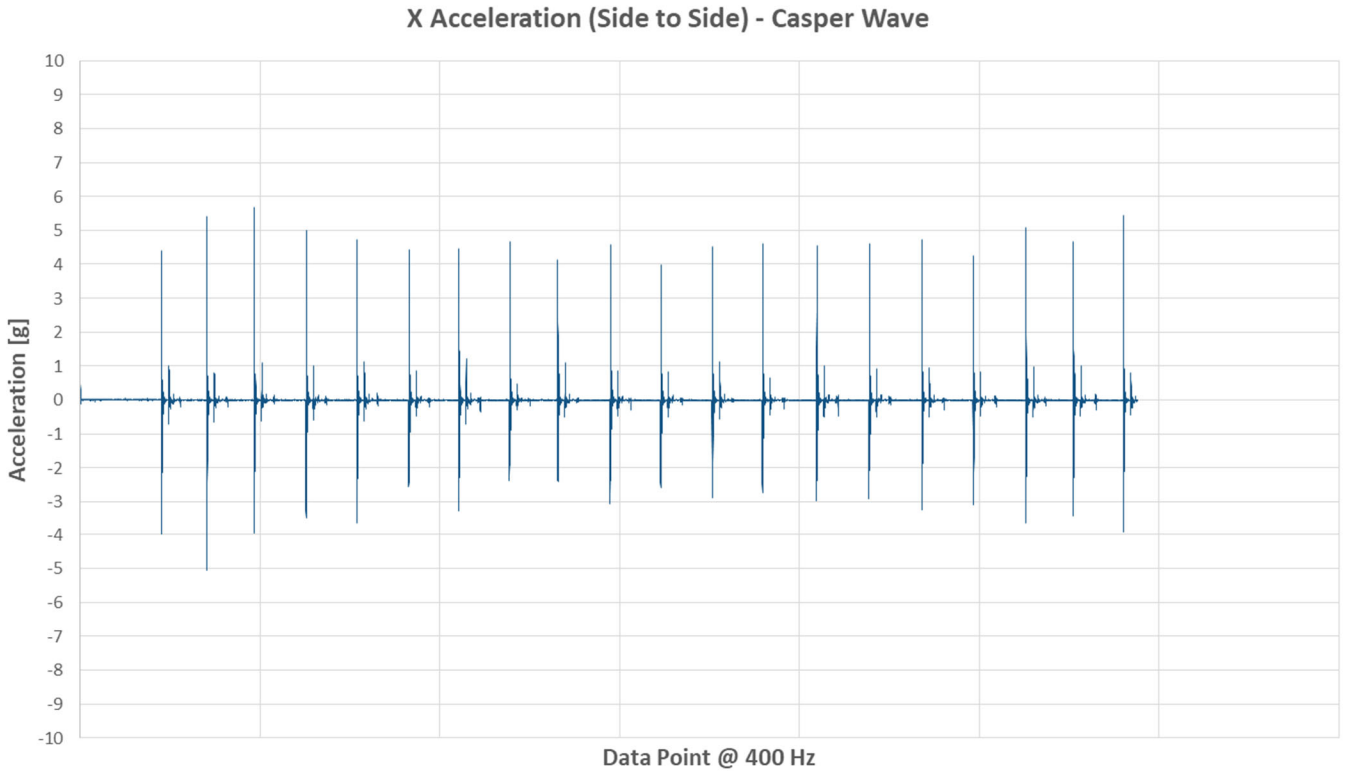


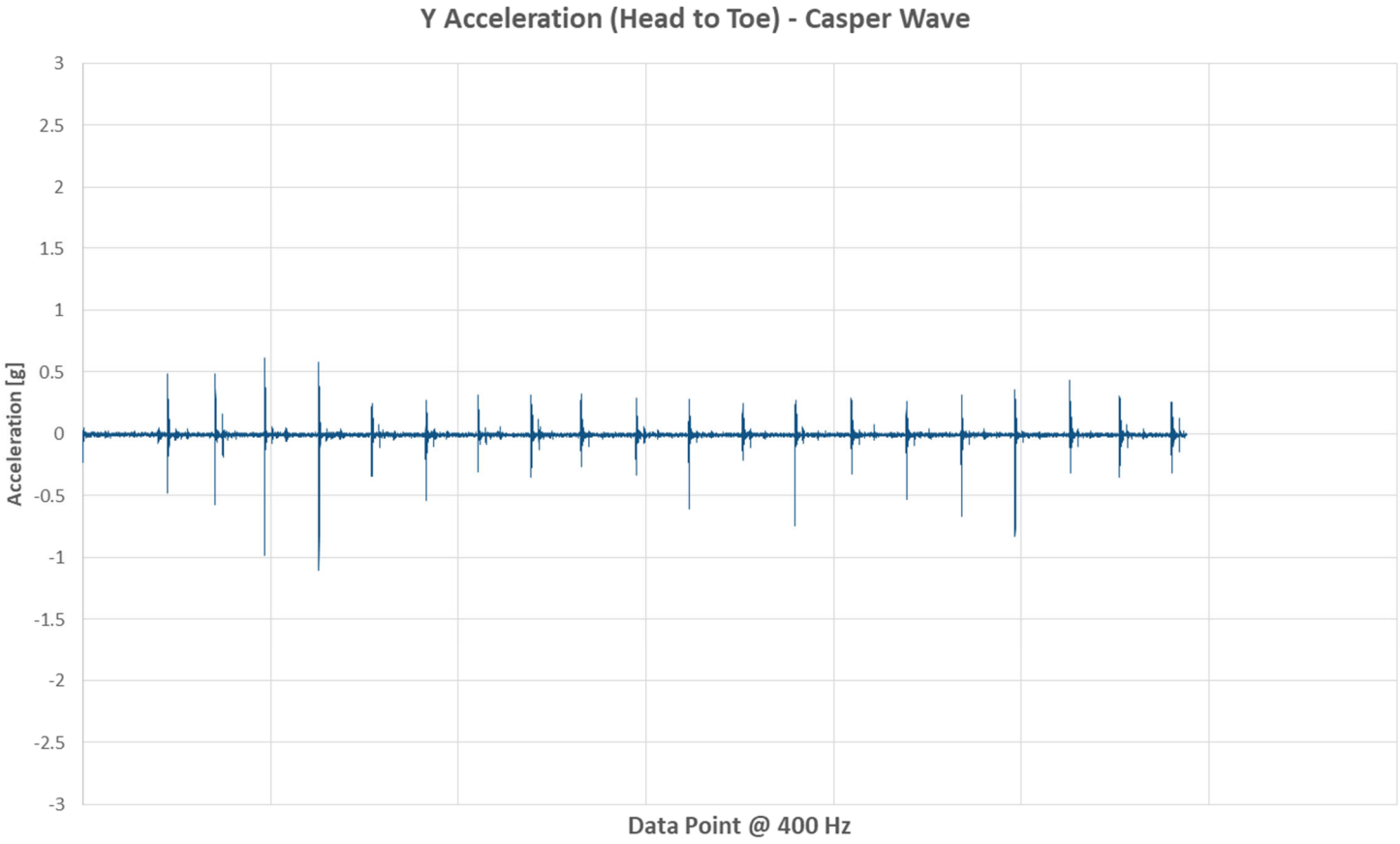

Y Acceleration (Head to Toe) - Casper Essential
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

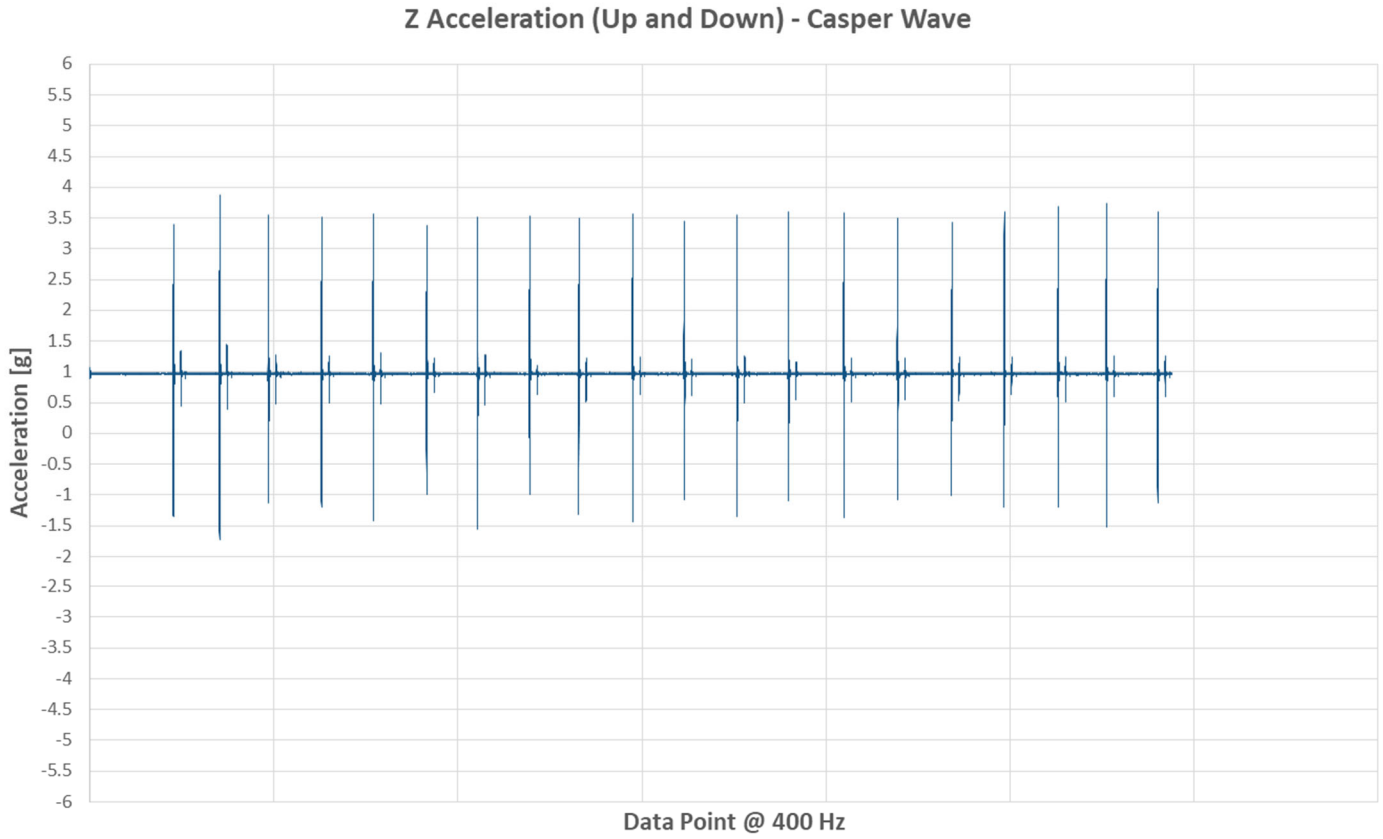

Z Acceleration (Up and Down) - Casper Essential
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – CASPER WAVE

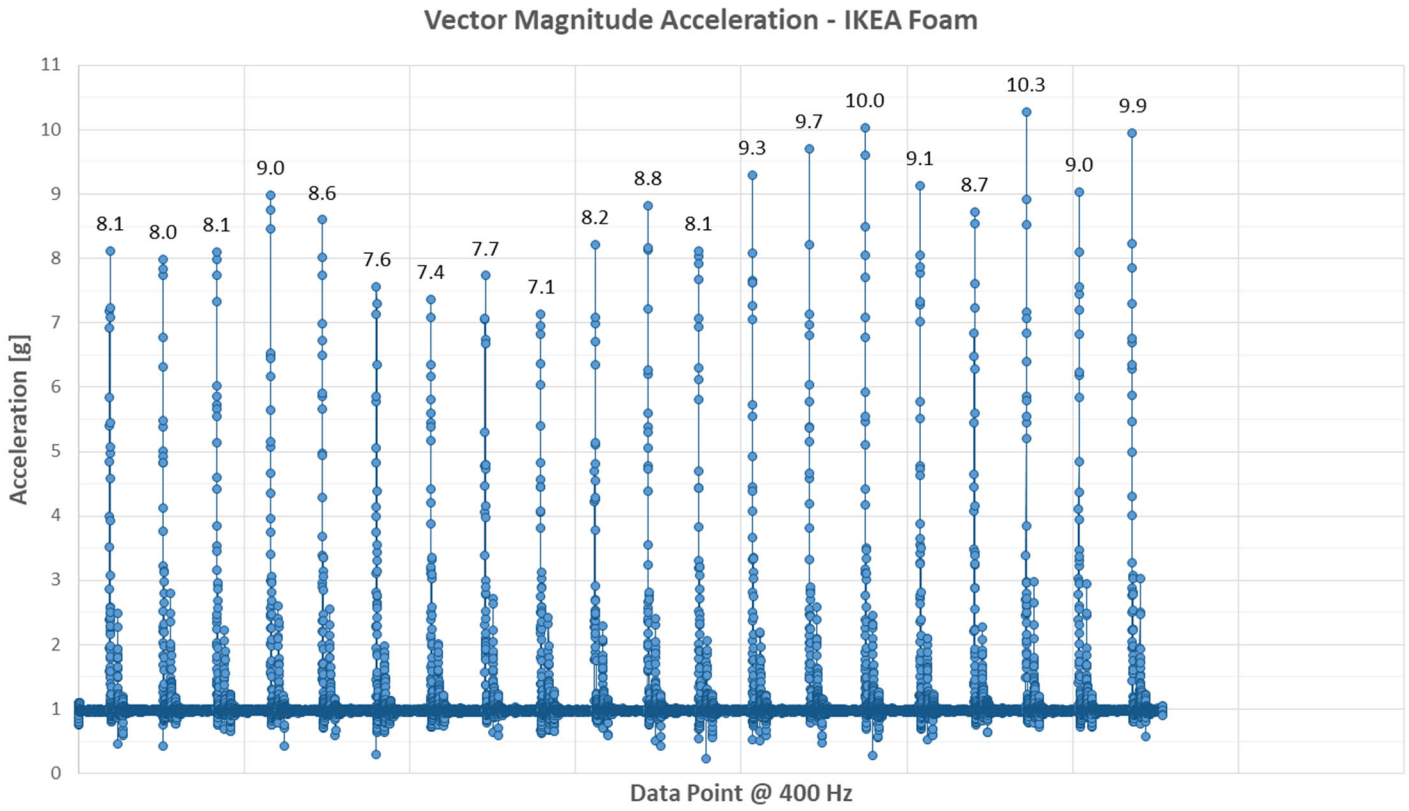


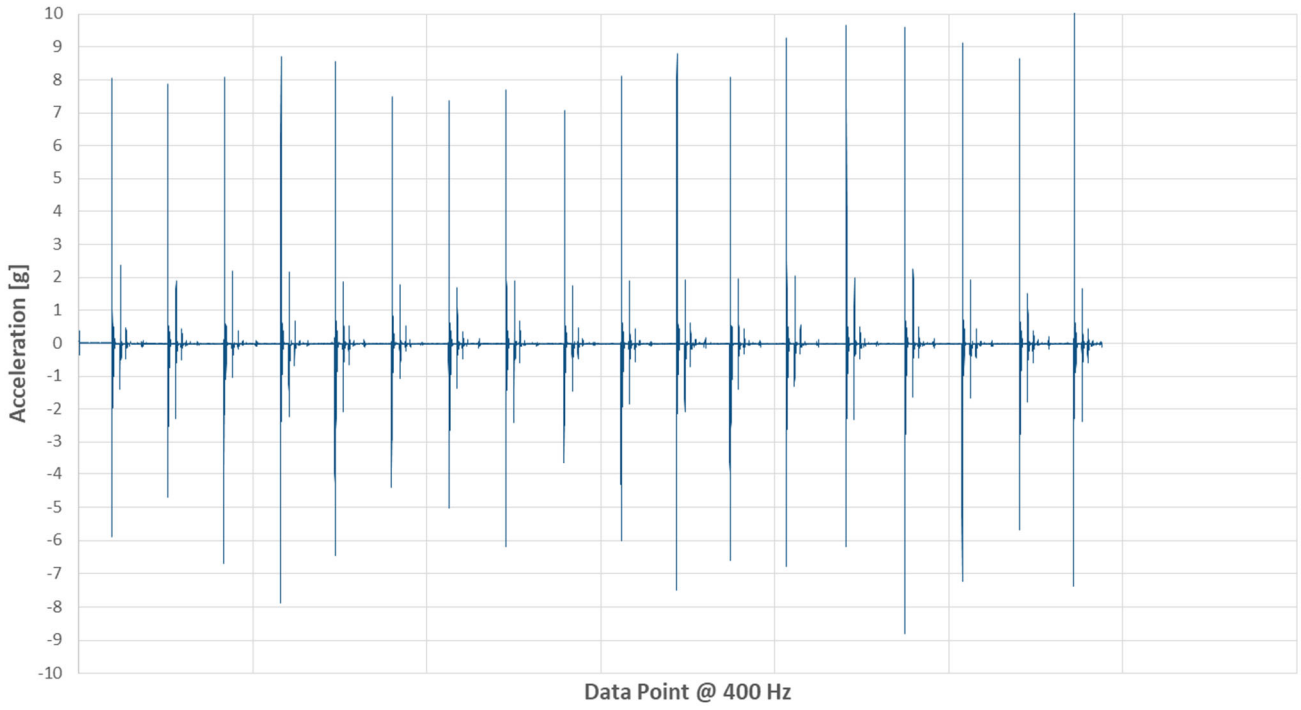


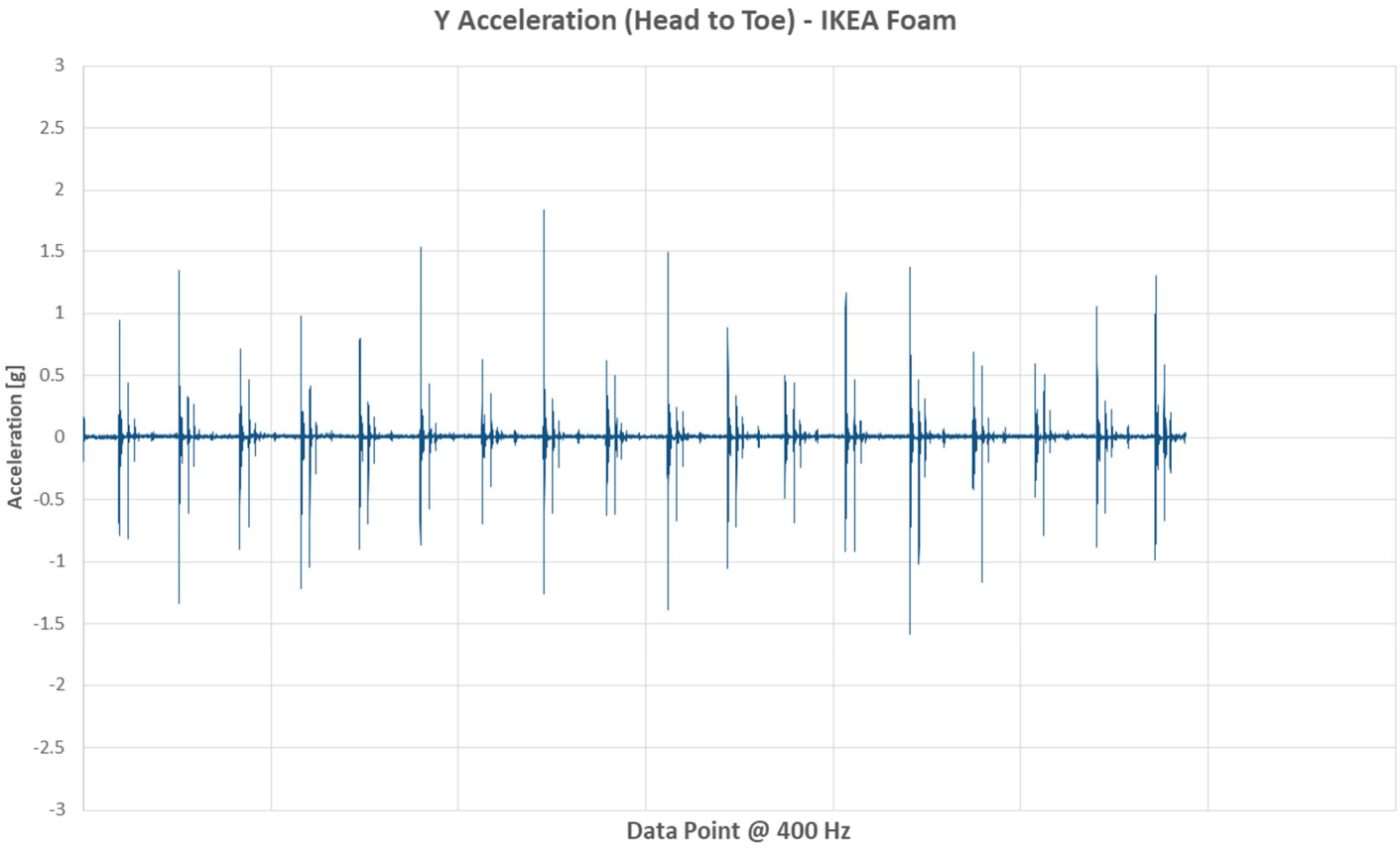

Y Acceleration (Head to Toe) - Casper Wave
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

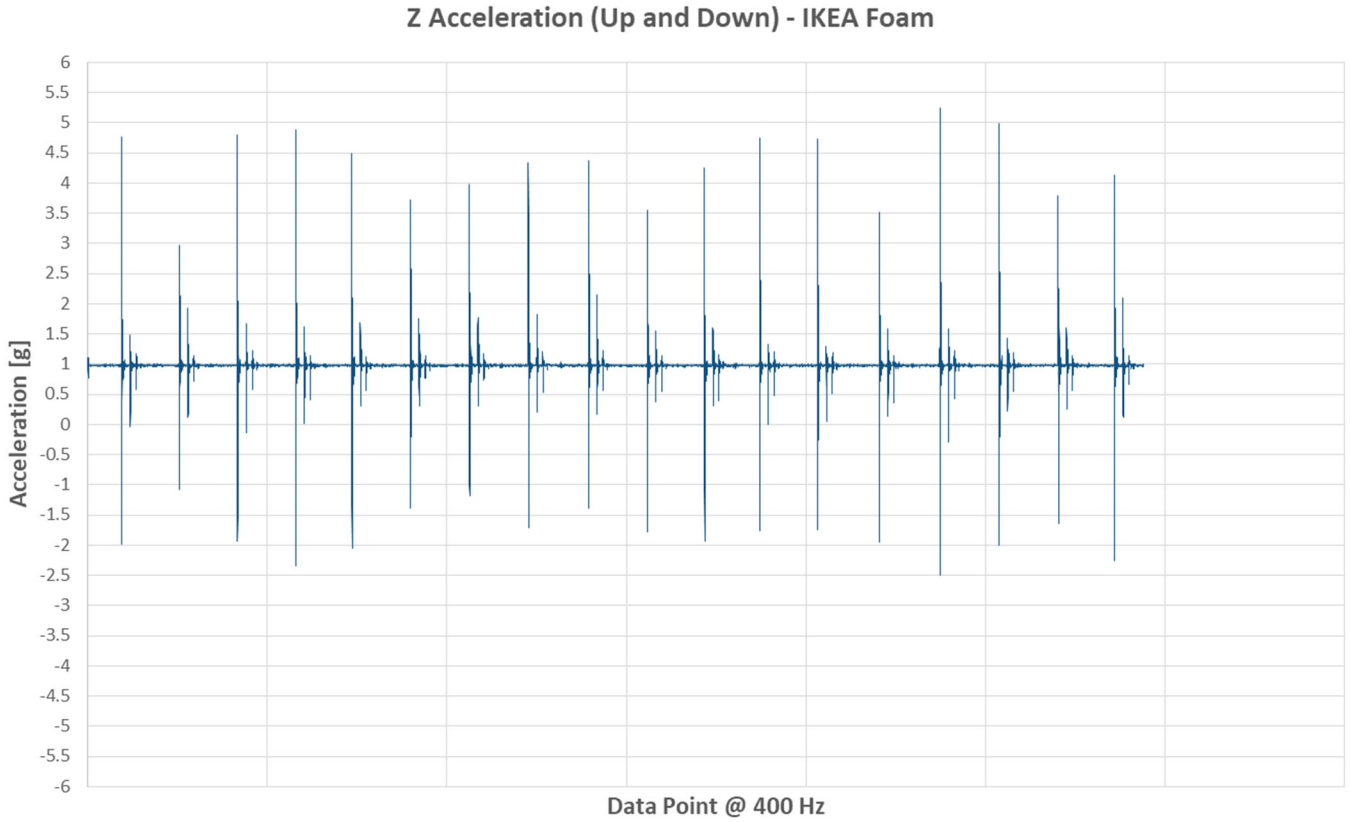

Z Acceleration (Up and Down) - Casper Wave
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – IKEA FOAM

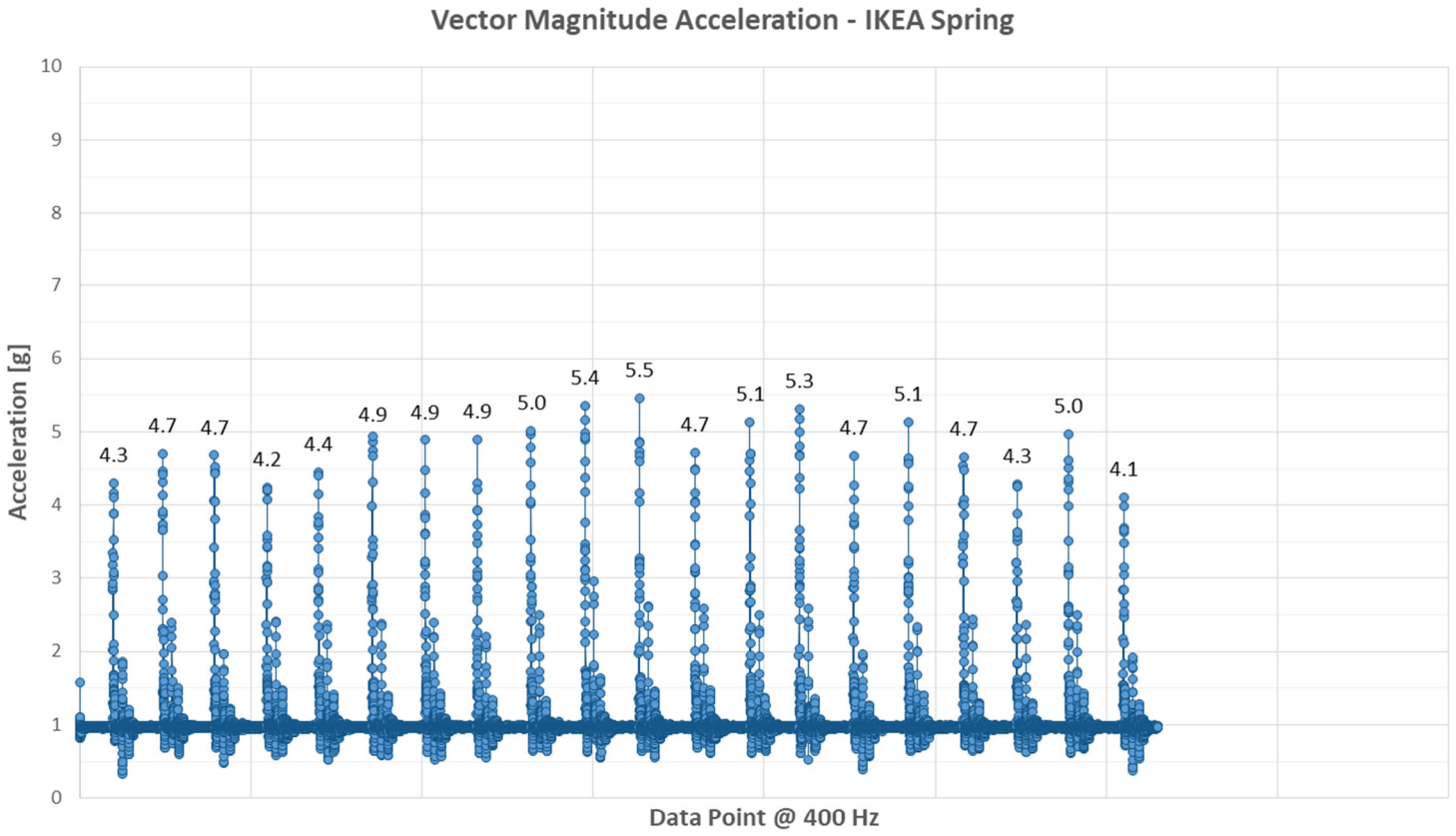


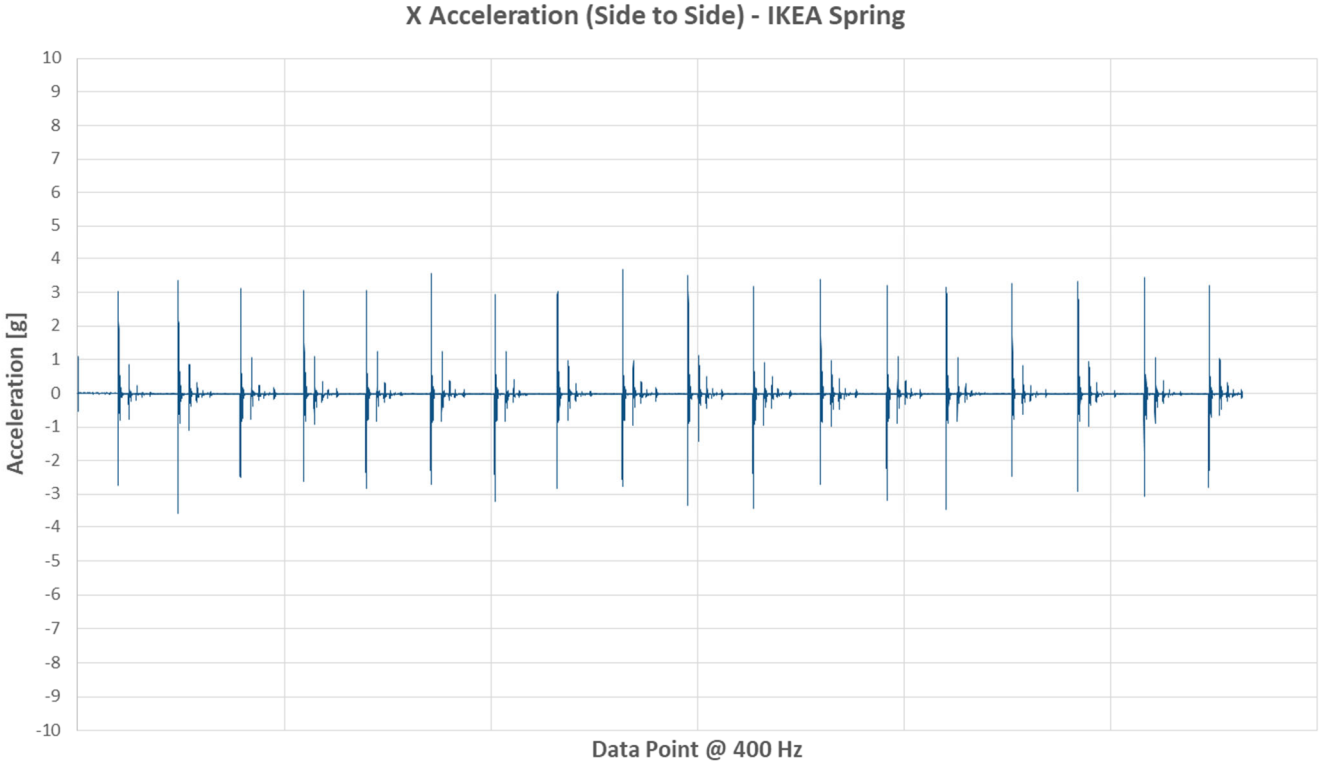


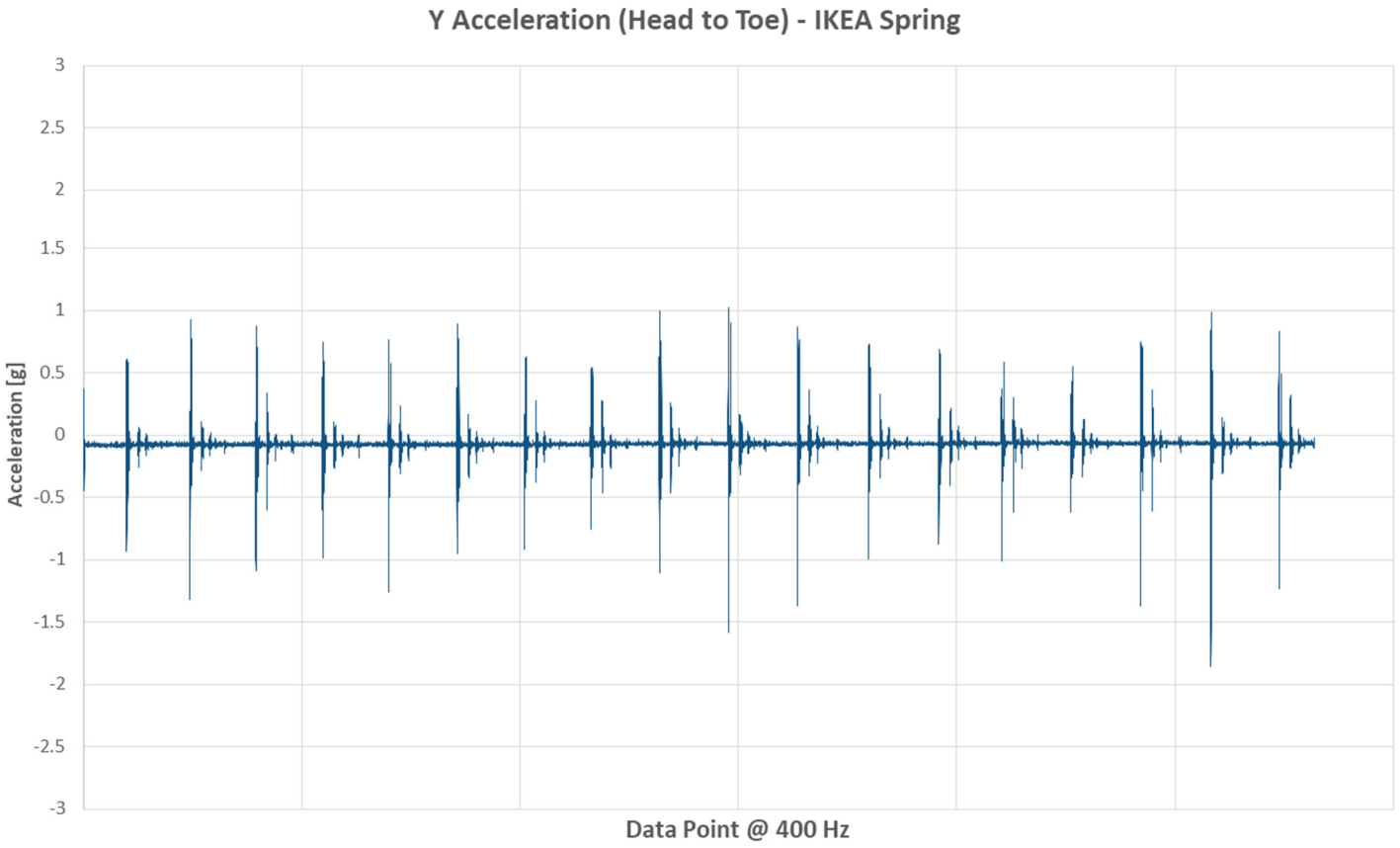

Y Acceleration (Head to Toe) - IKEA Foam
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

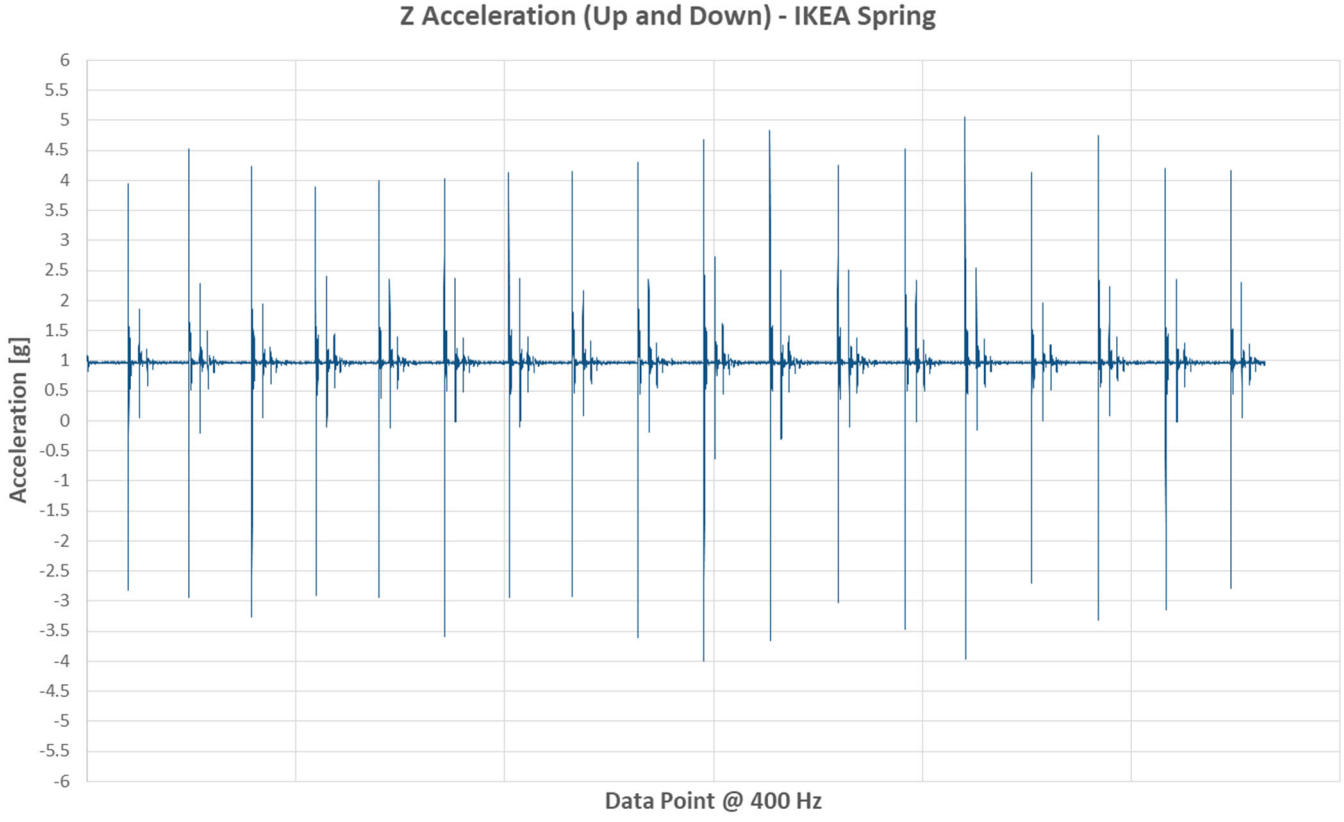

Z Acceleration (Up and Down) - IKEA Foam
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – IKEA SPRING

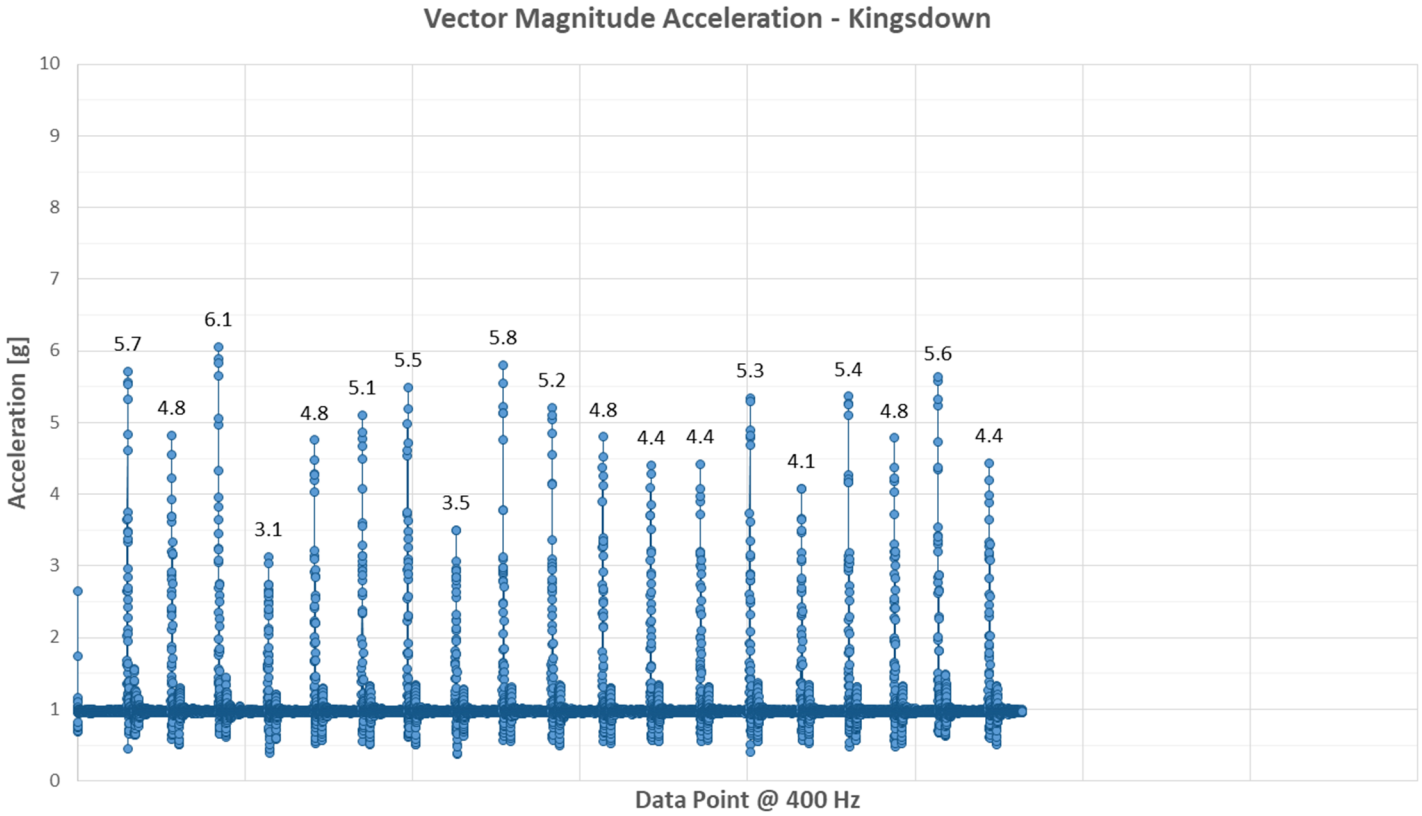


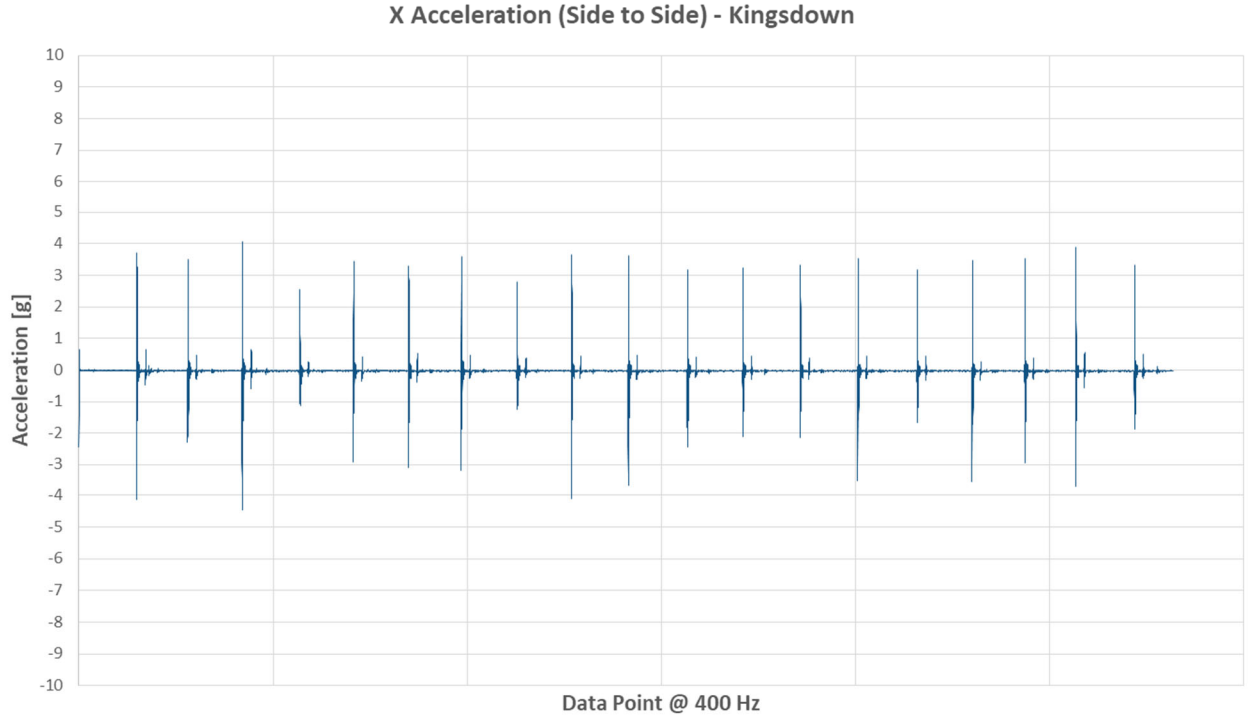


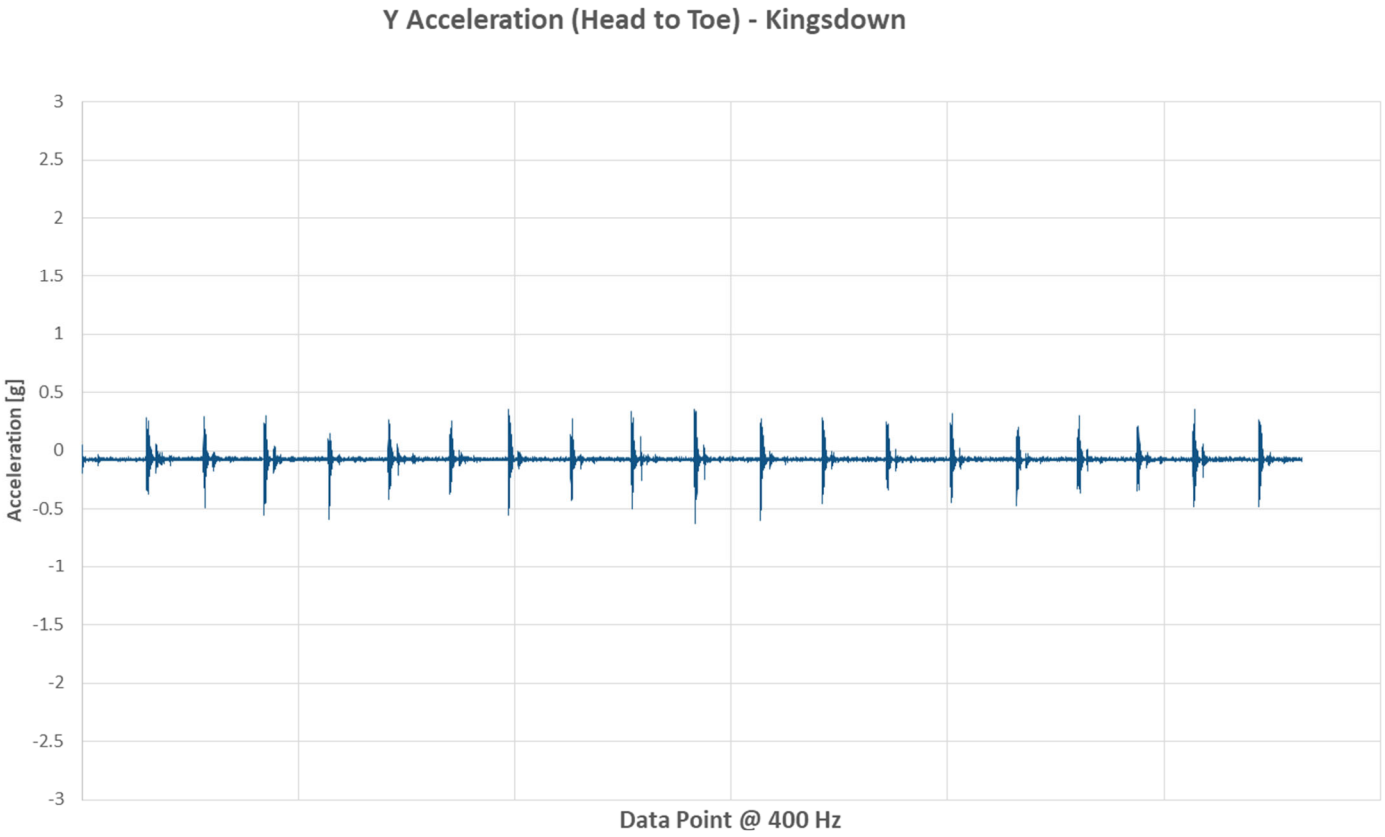

Y Acceleration (Head to Toe) - IKEA Spring
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

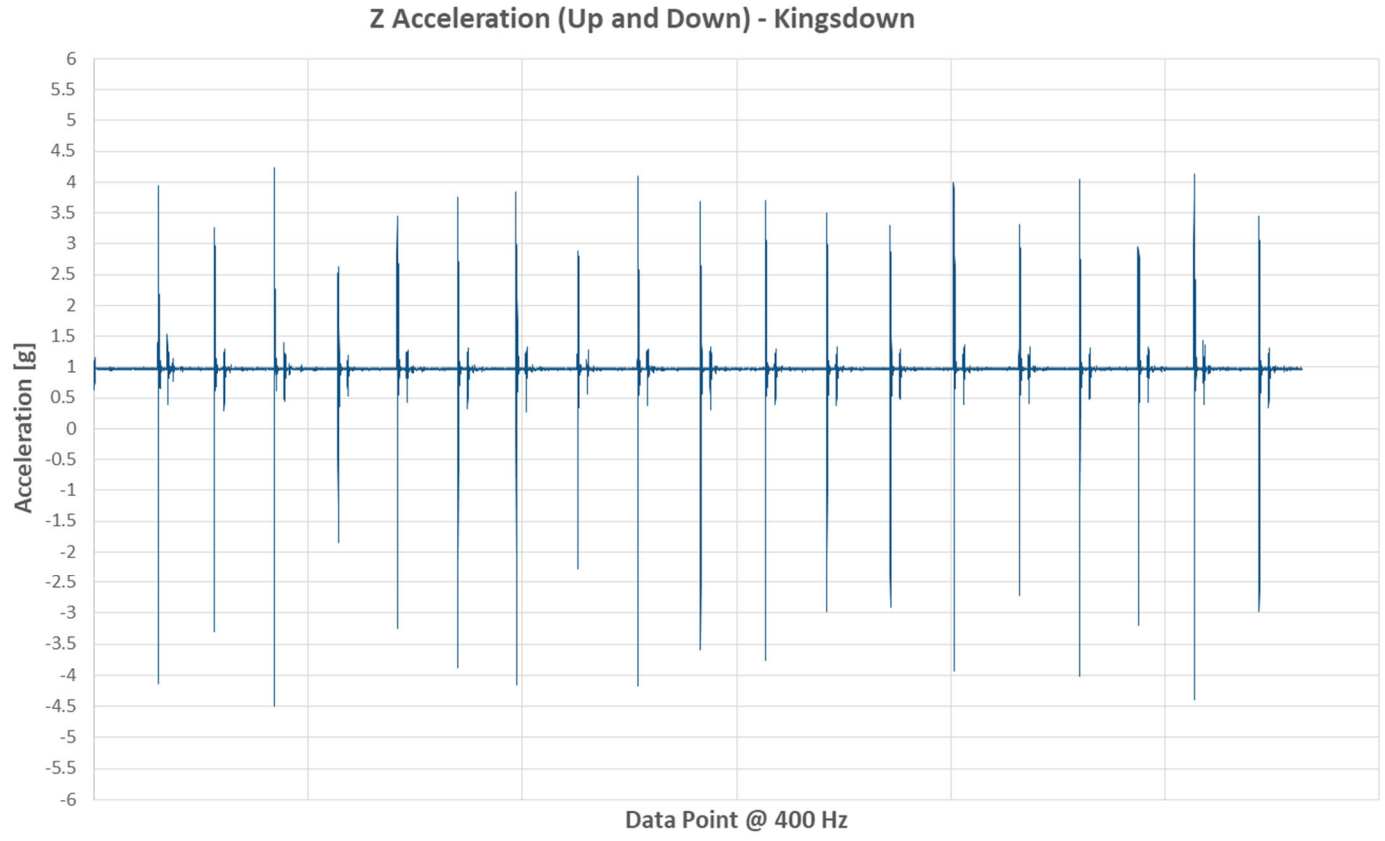

Z Acceleration (Up and Down) - IKEA Spring
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – KINGSDOWN

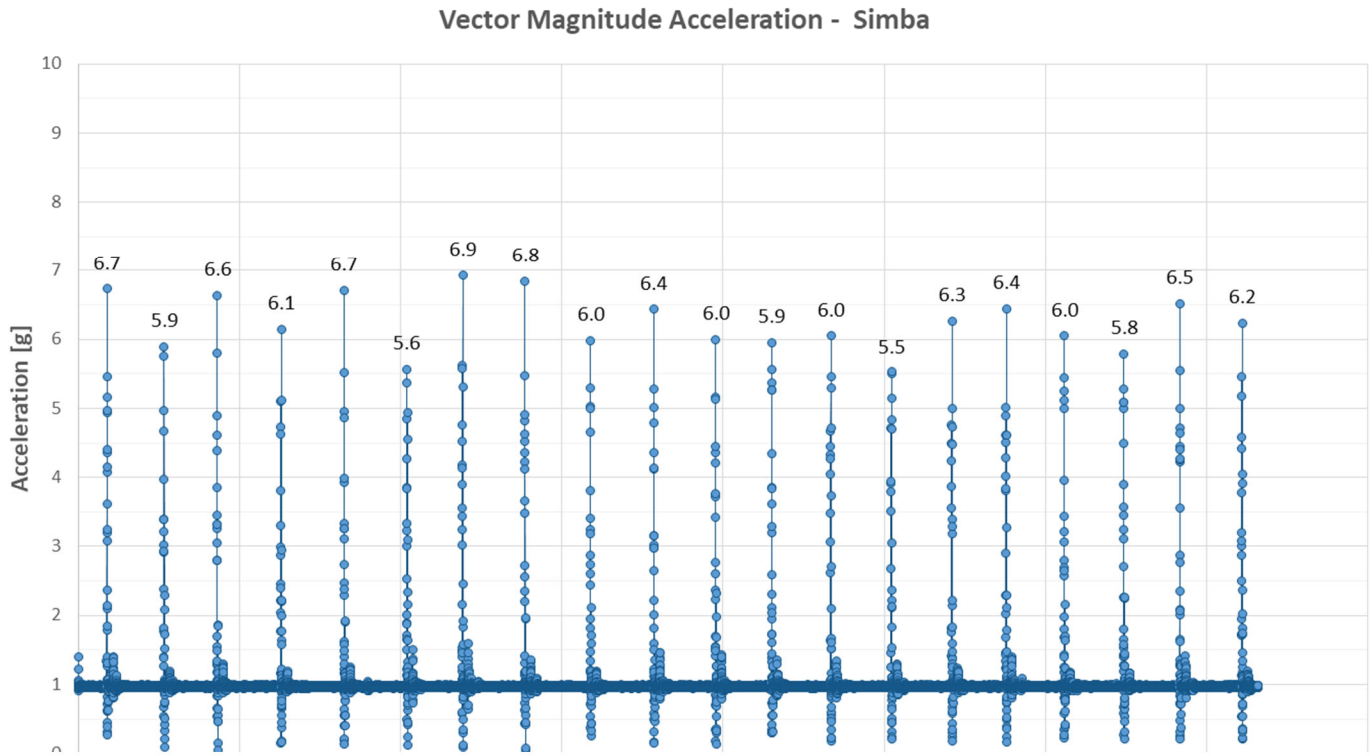


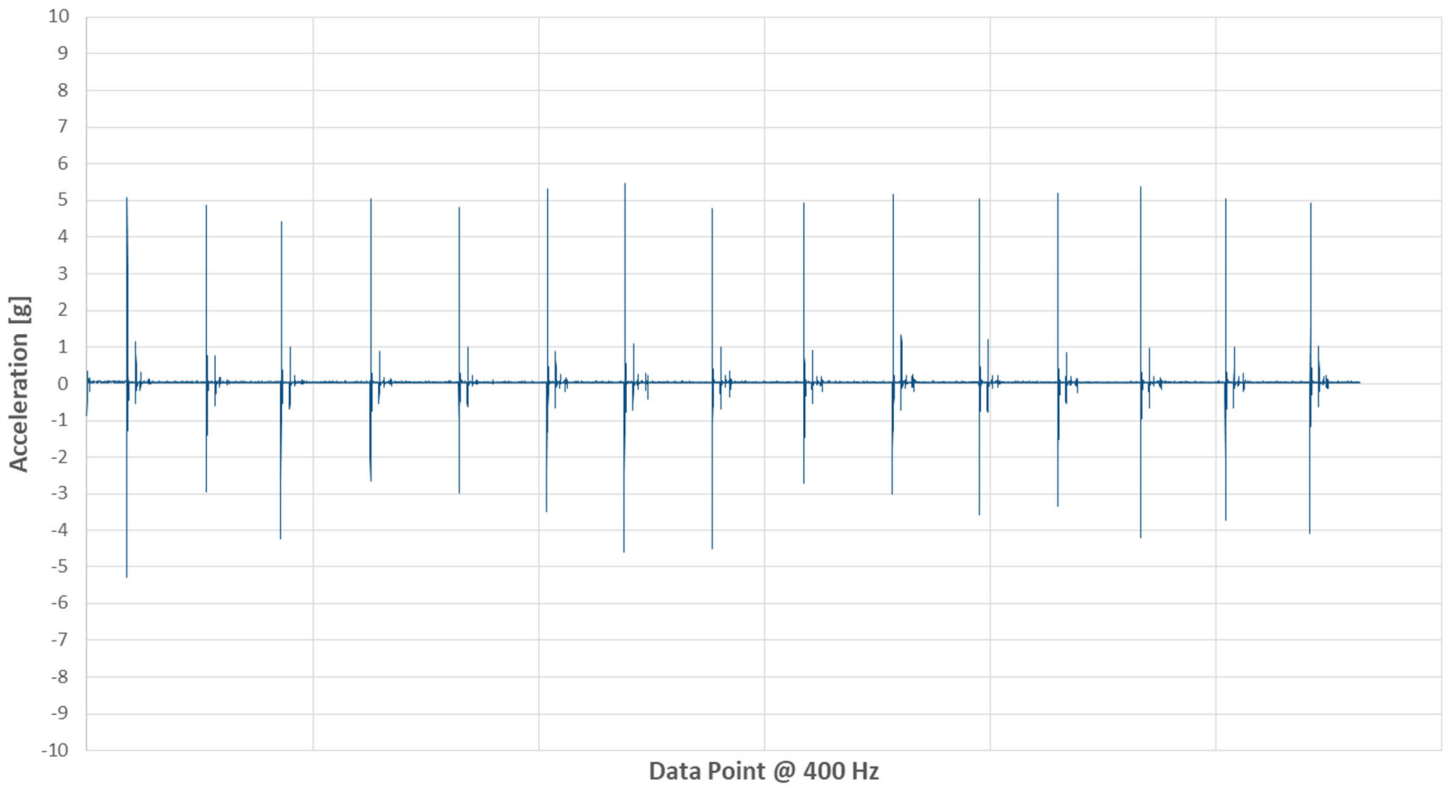


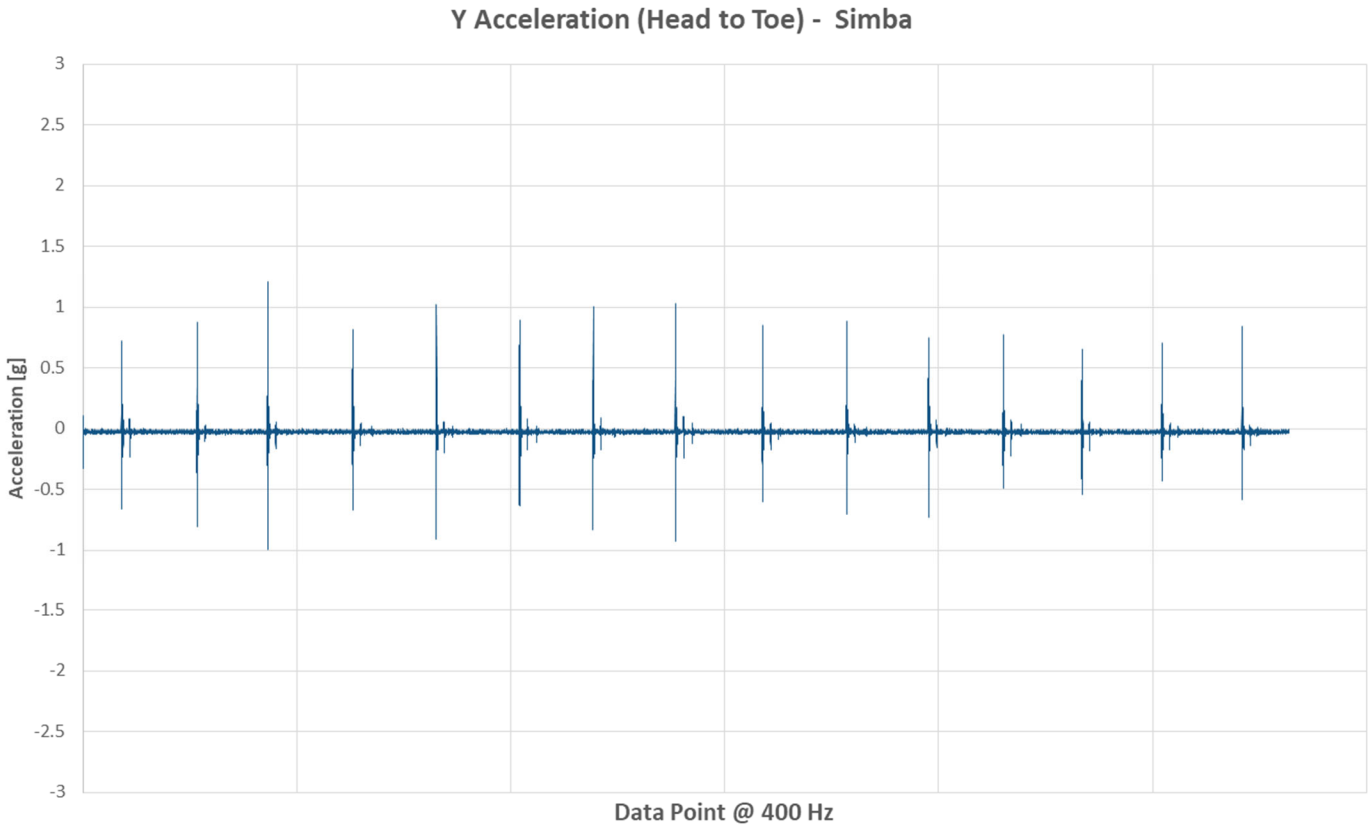

Y Acceleration (Head to Toe) - Kingsdown
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

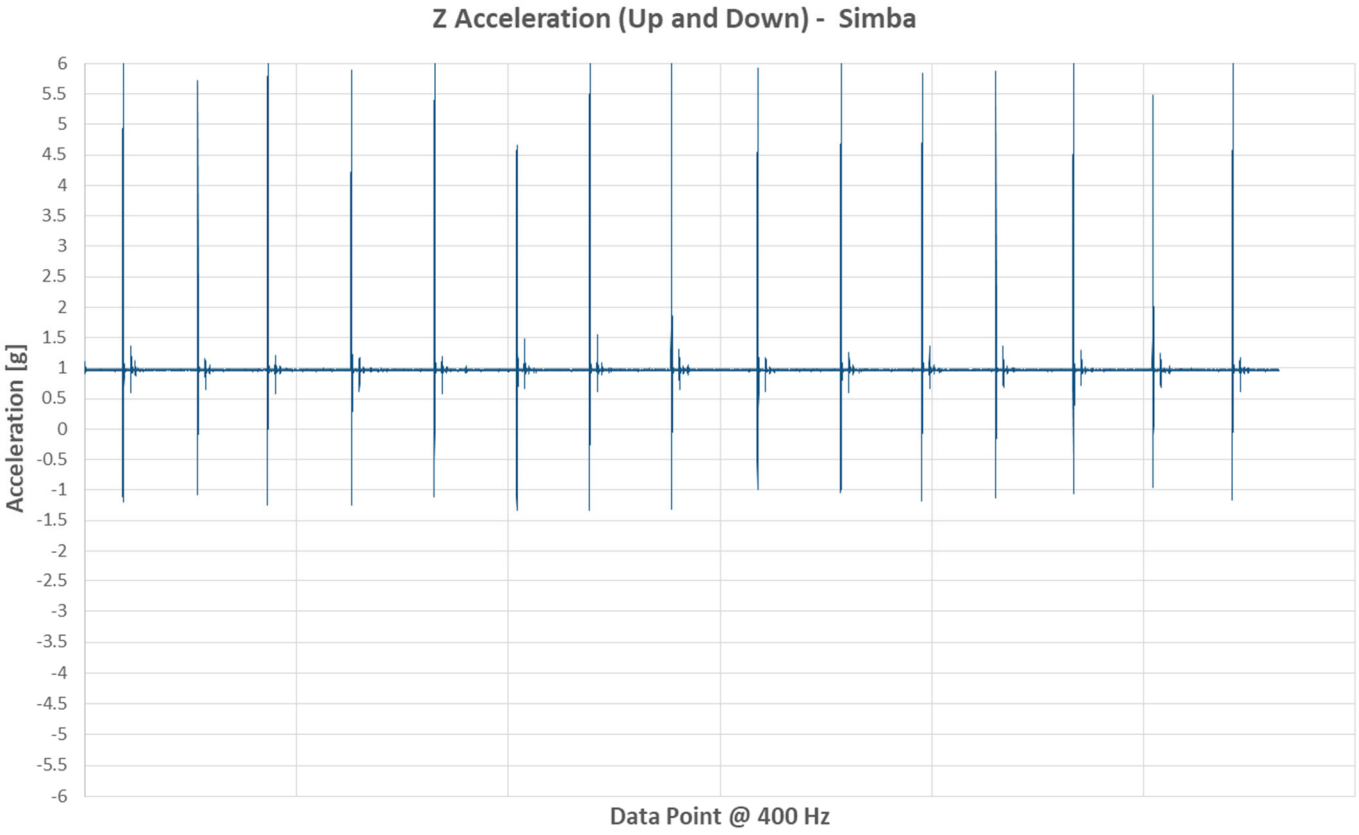

Z Acceleration (Up and Down) - Kingsdown
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – SIMBA

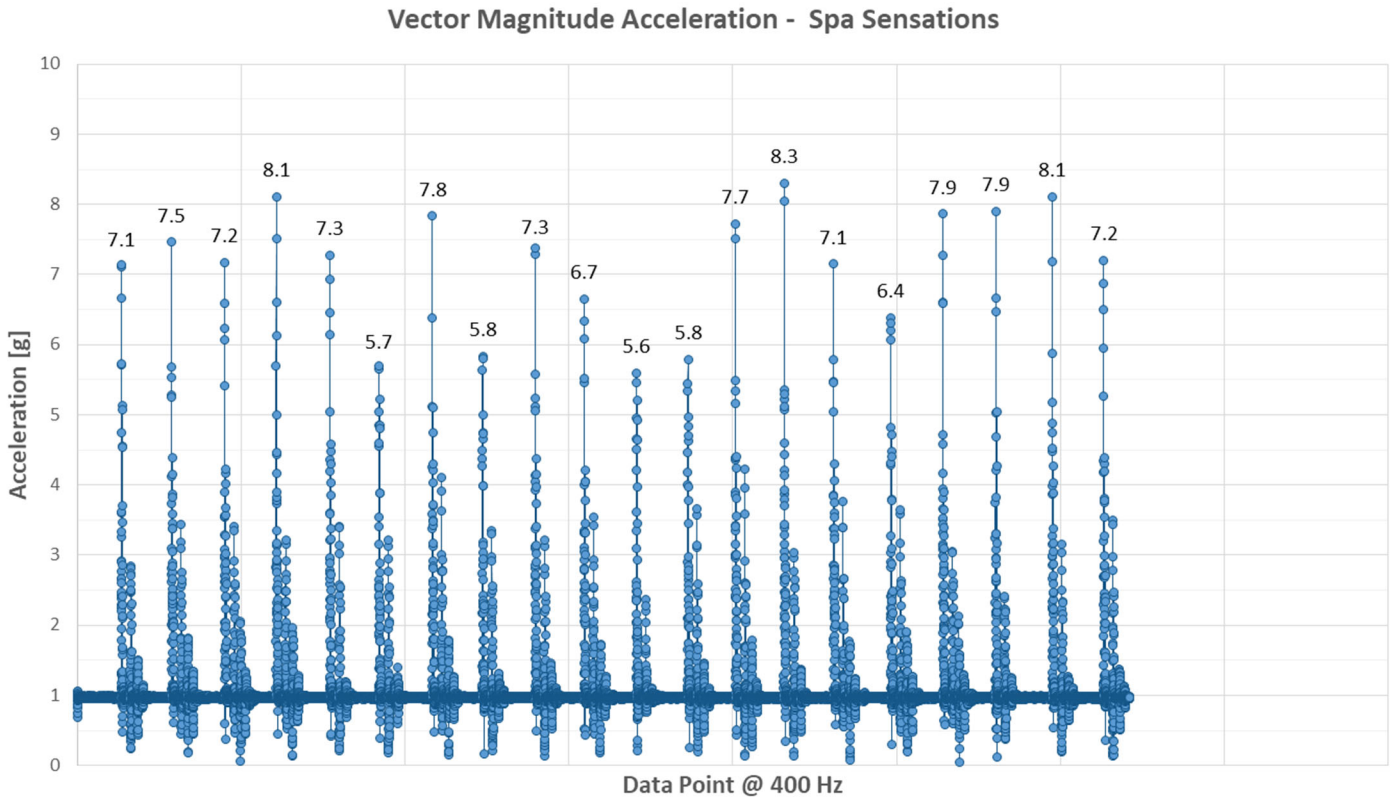

Vector Magnitude Acceleration - Simba
Acceleration [g]
10
9
8
7
6
5
4
3
2
1
0
6.7
5.9
6.6
6.1
6.7
5.6
6.9
6.8
6.0
6.4
6.0
5.9
6.0
5.5
6.3
6.4
6.0
5.8
6.5
6.2

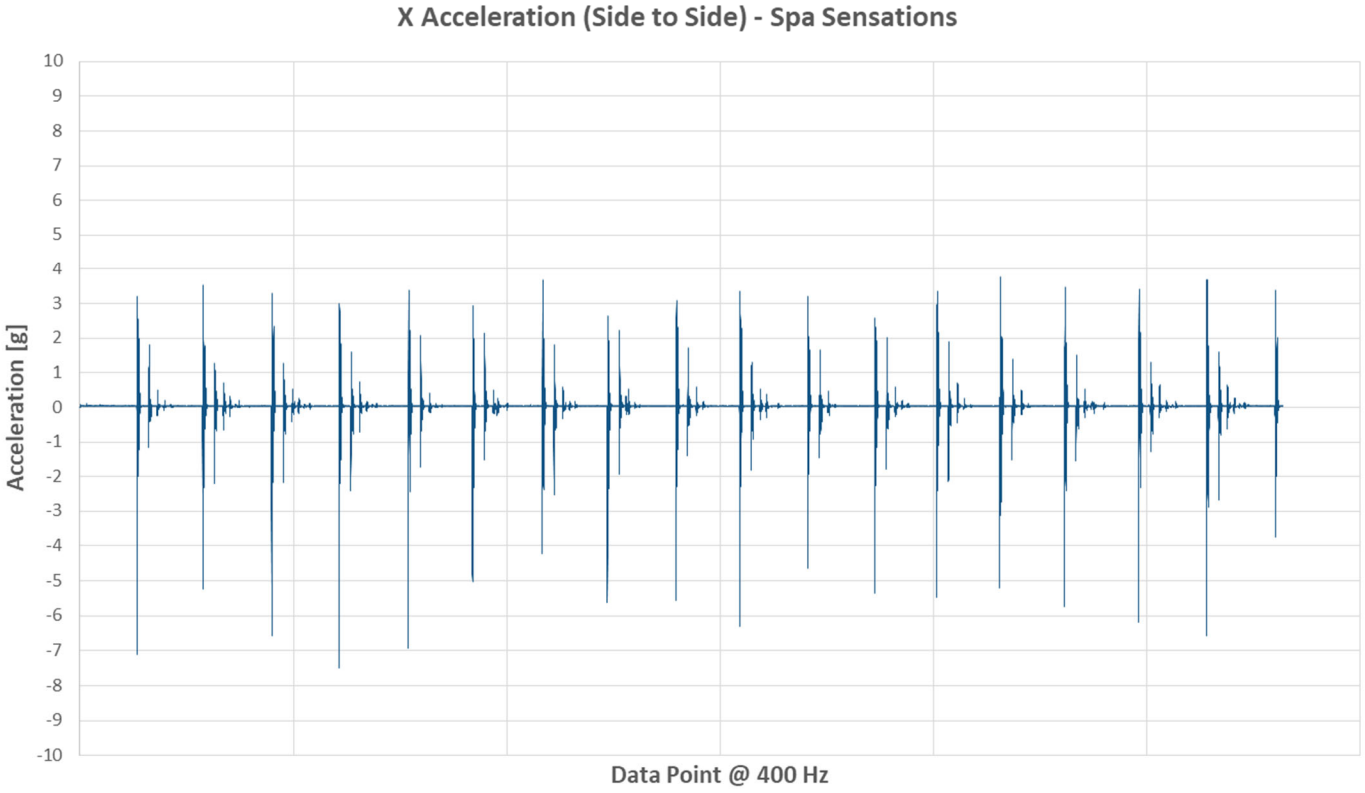

X Acceleration (Side to Side) - Simba
Acceleration [g]
10
9
8
7
6
5
4
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
Data Point @ 400 Hz

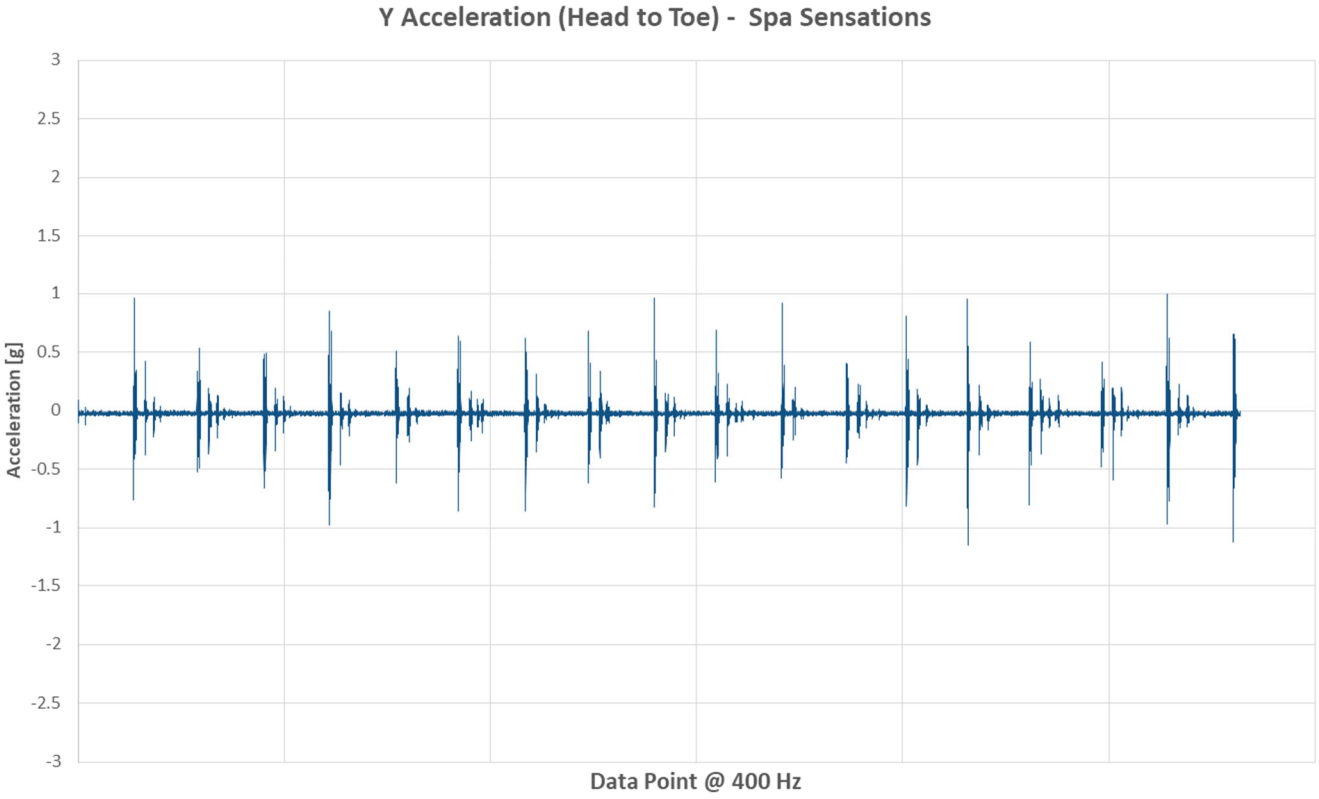

Y Acceleration (Head to Toe) - Simba
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

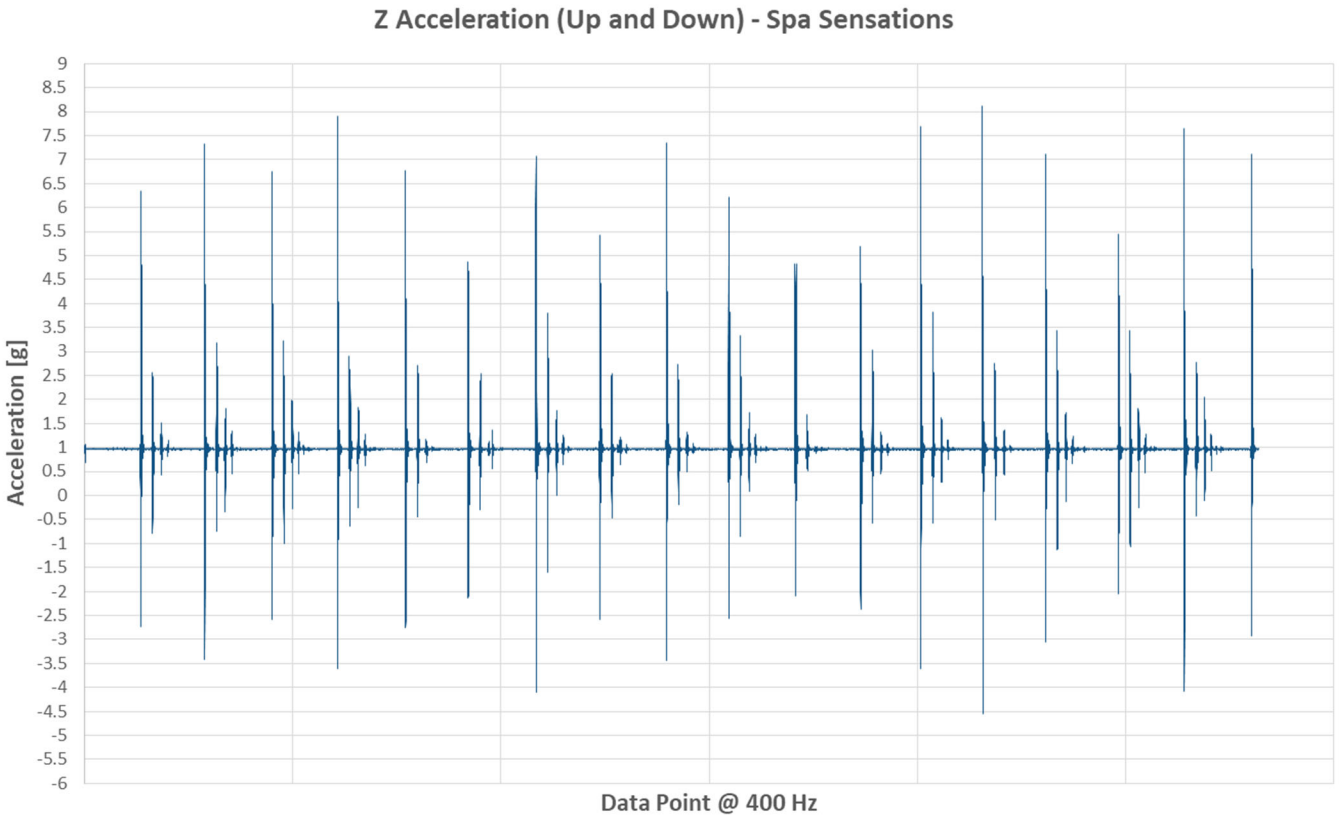

Z Acceleration (Up and Down) - Simba
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – SPA SENSATIONS

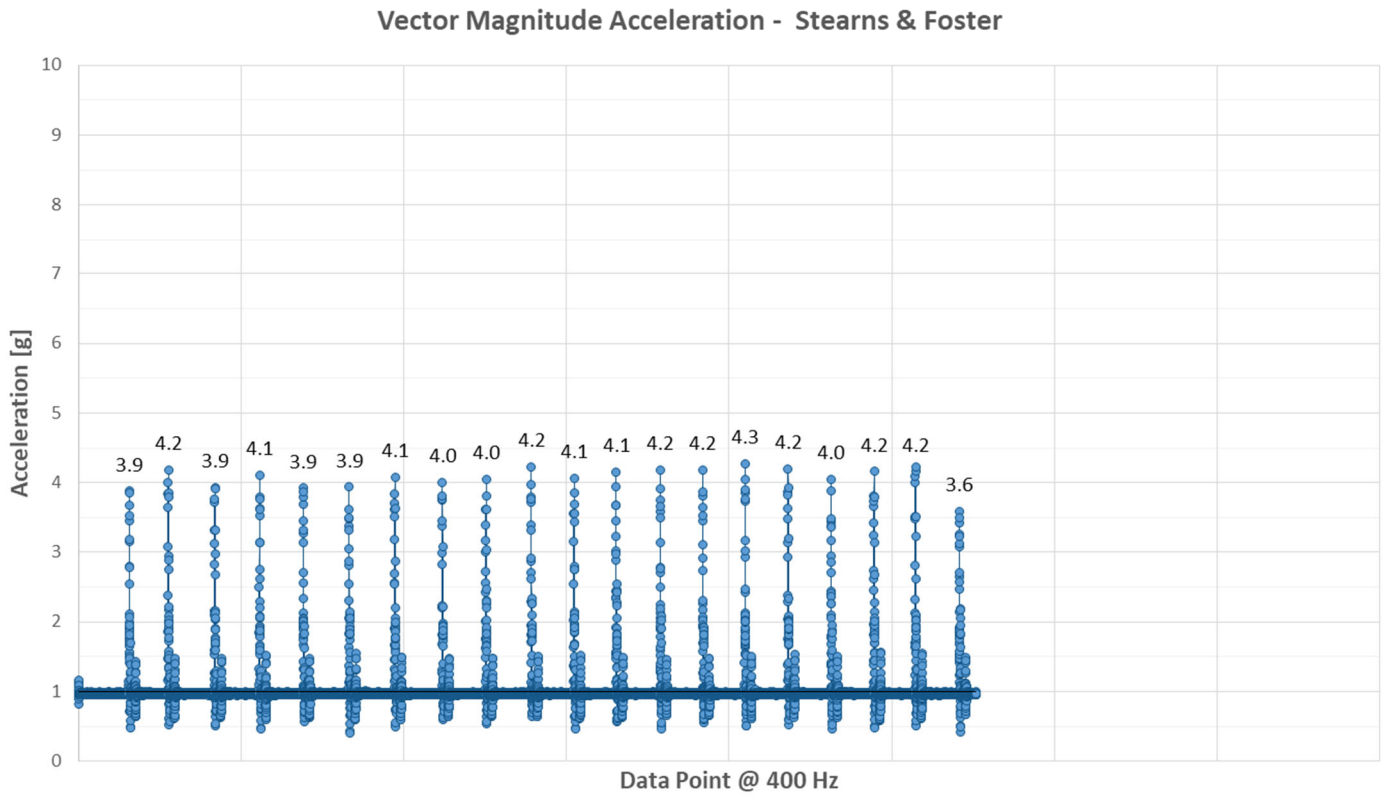


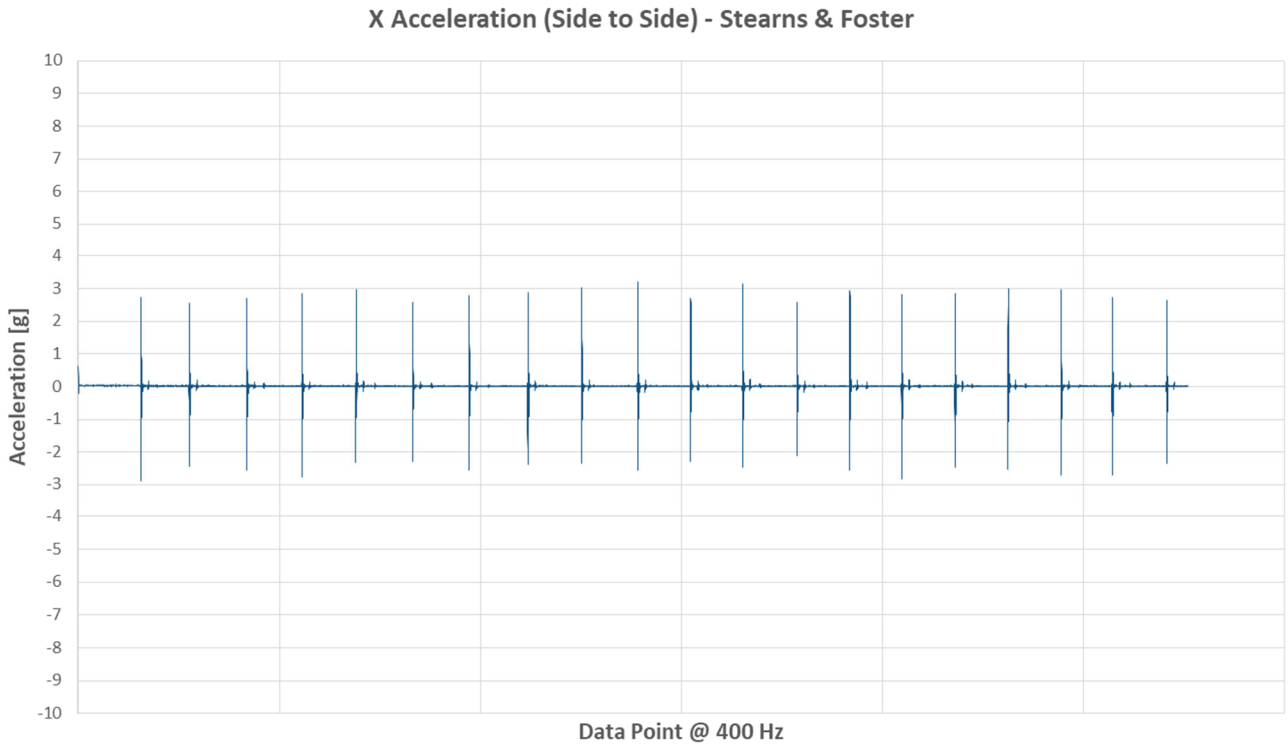


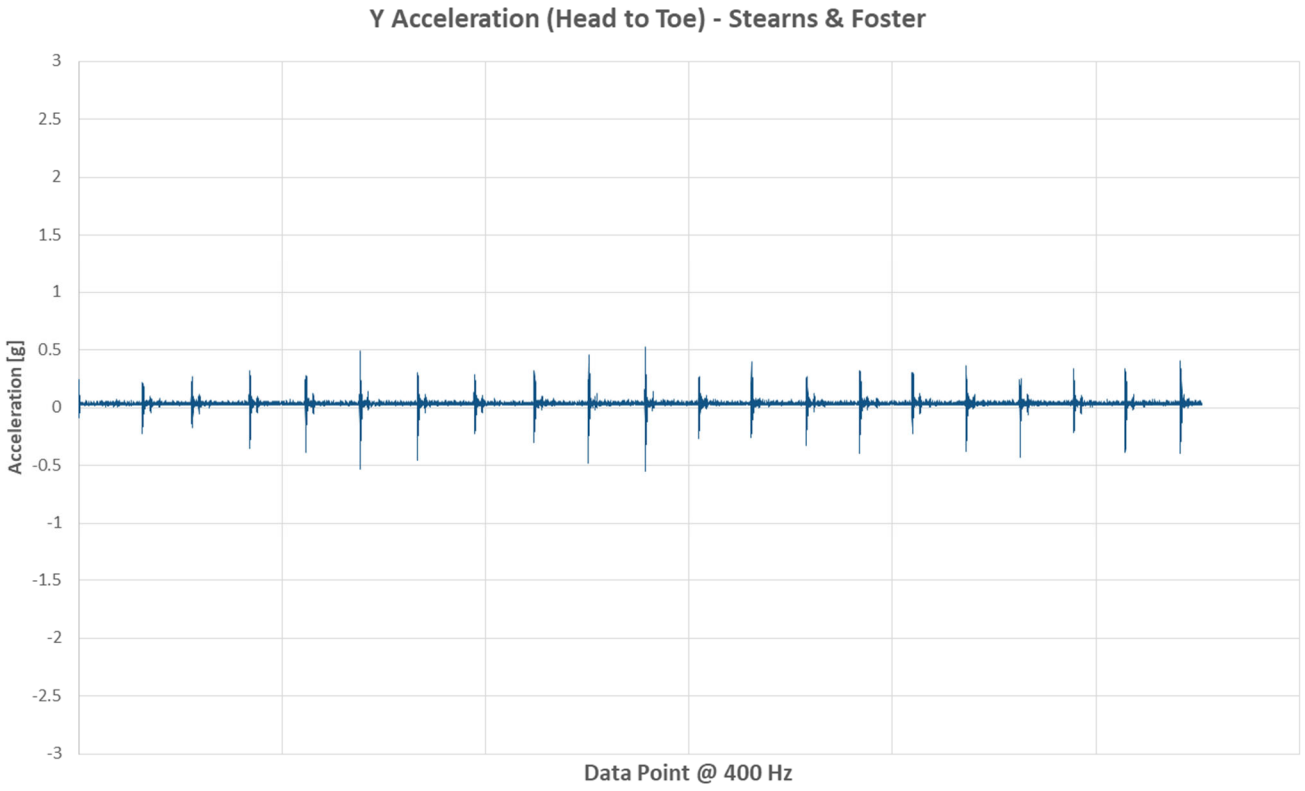

Y Acceleration (Head to Toe) - Spa Sensations
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

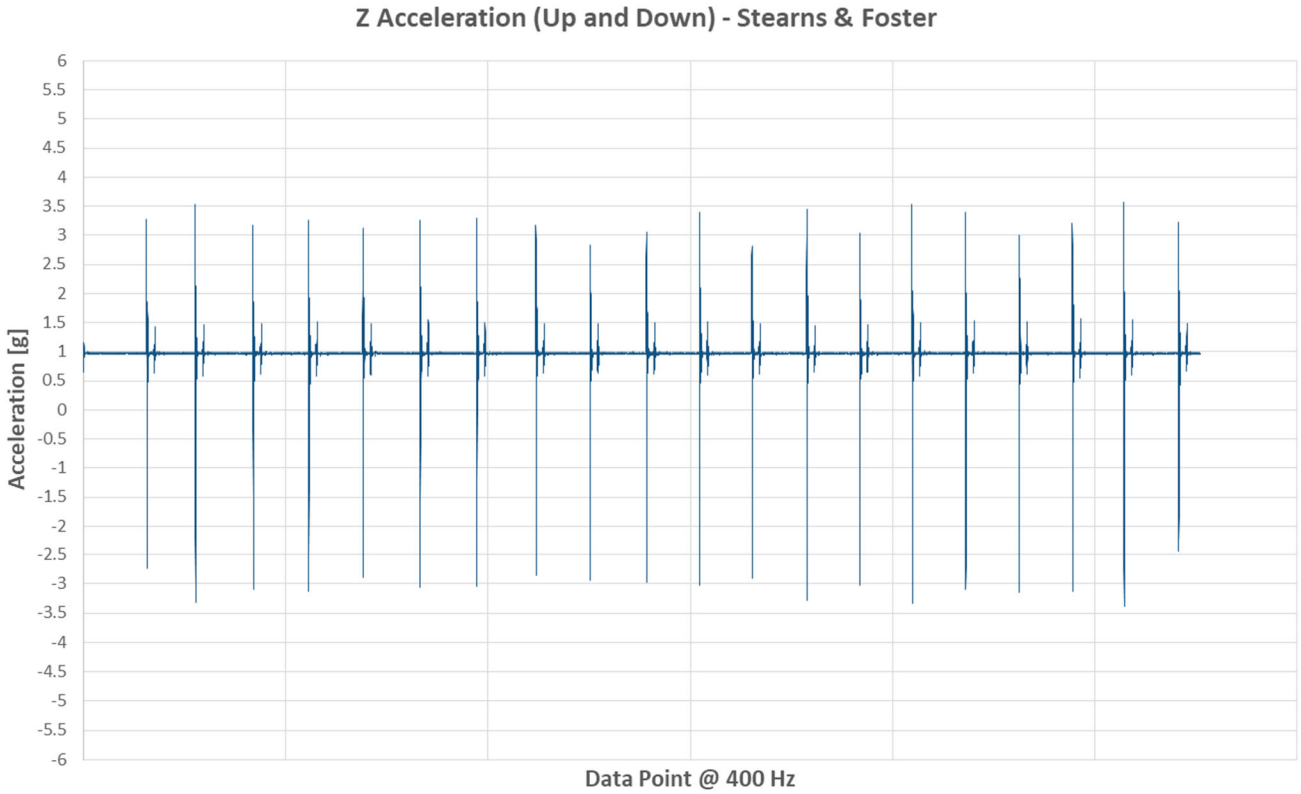

Z Acceleration (Up and Down) - Spa Sensations
Acceleration [g]
9
8.5
8
7.5
7
6.5
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – STEARNS & FOSTER

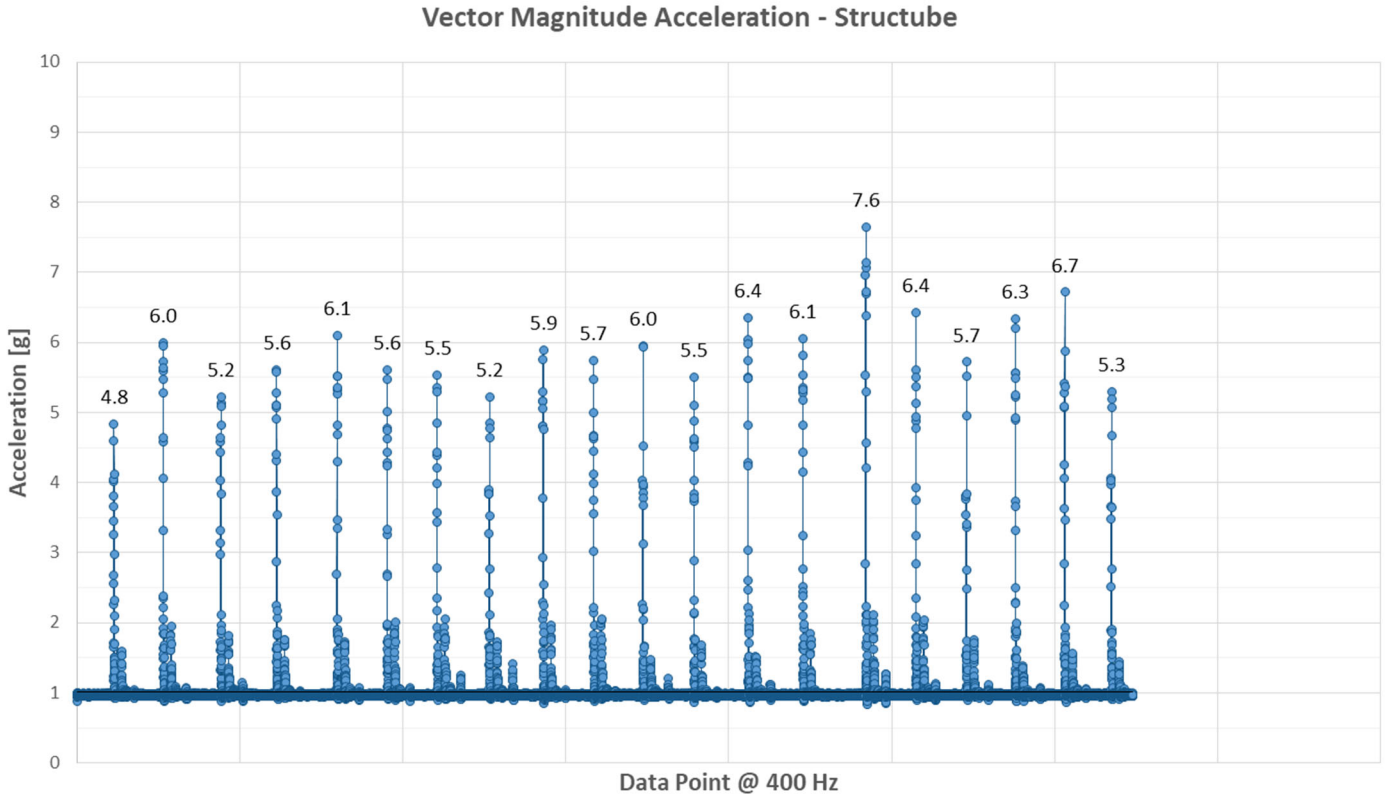


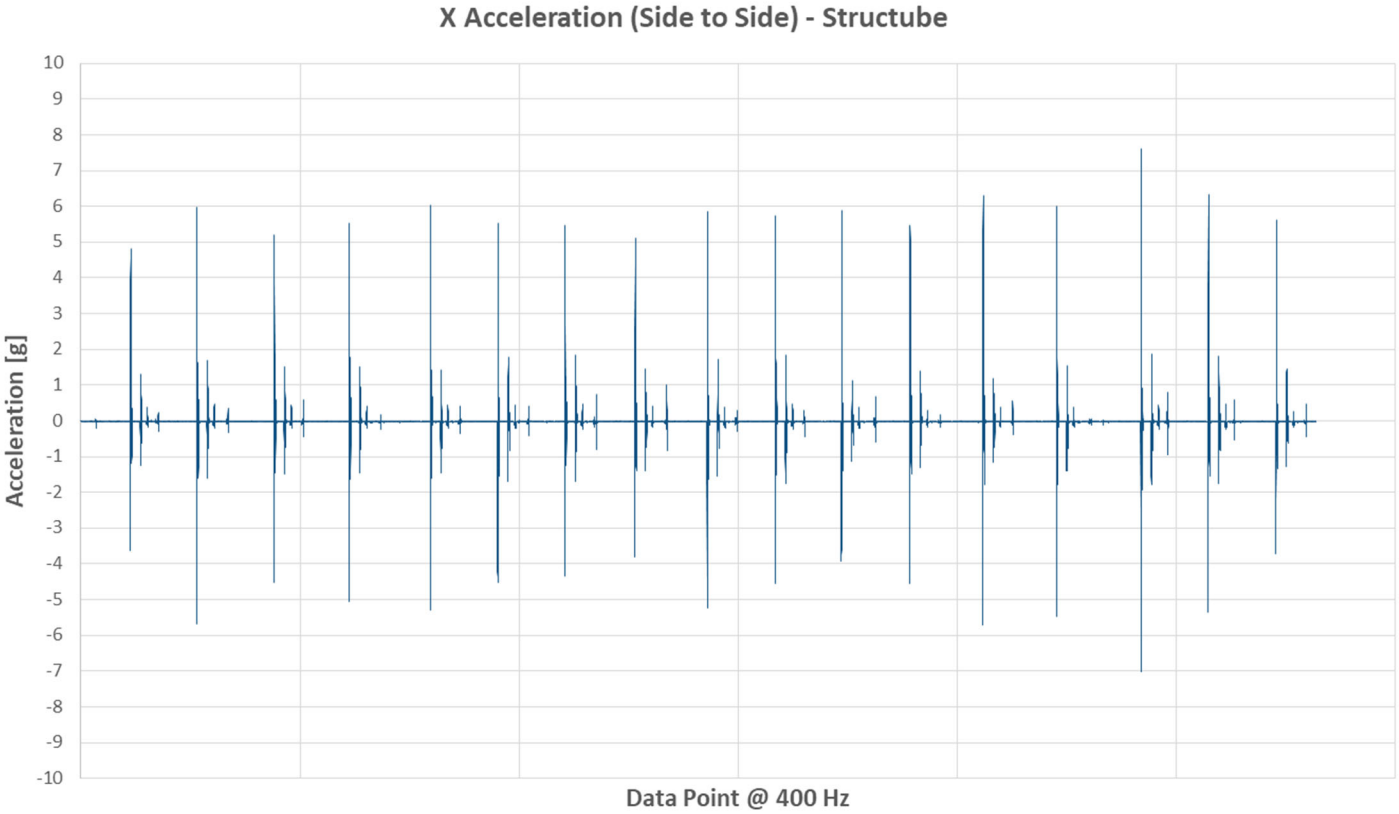


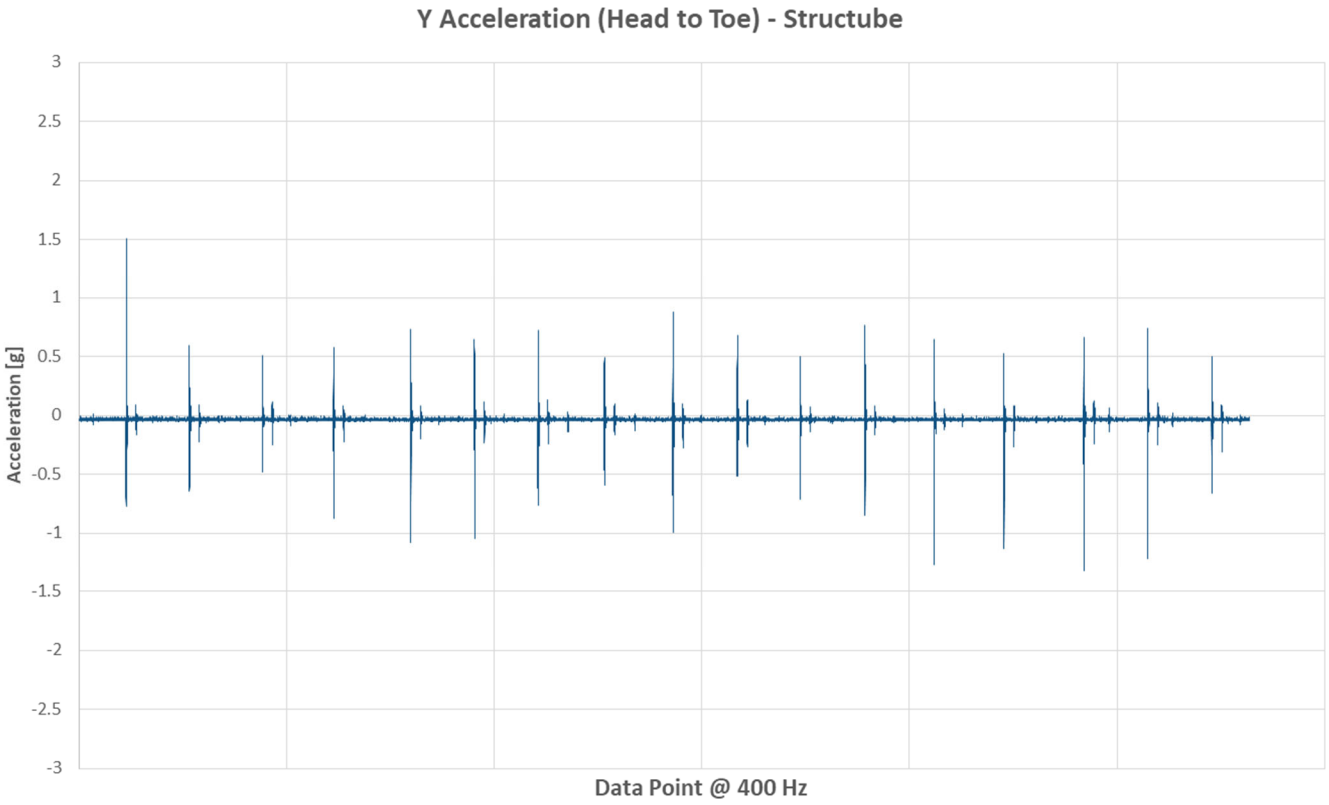

Y Acceleration (Head to Toe) - Stearns & Foster
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

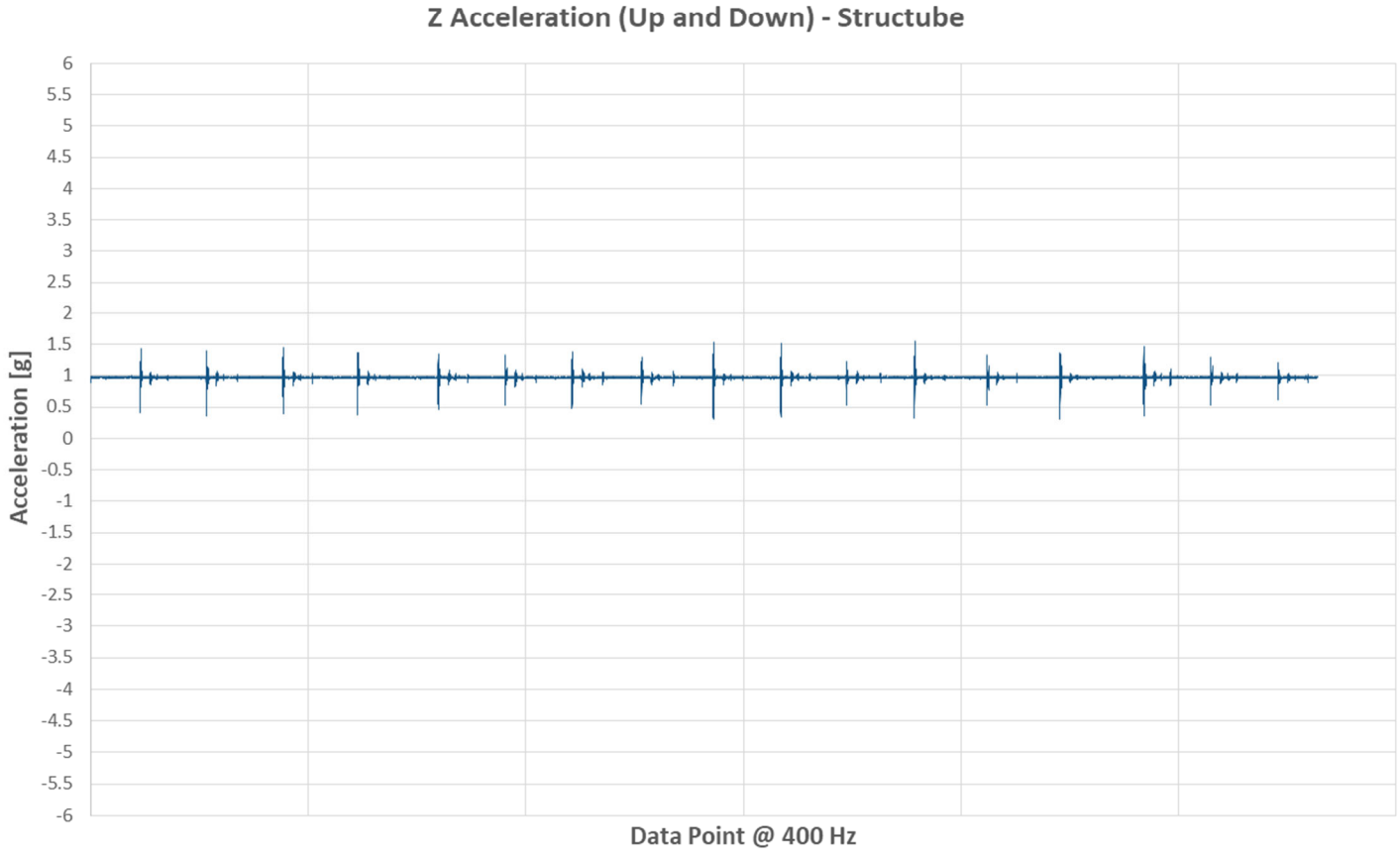

Z Acceleration (Up and Down) - Stearns & Foster
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – STRUCTURE

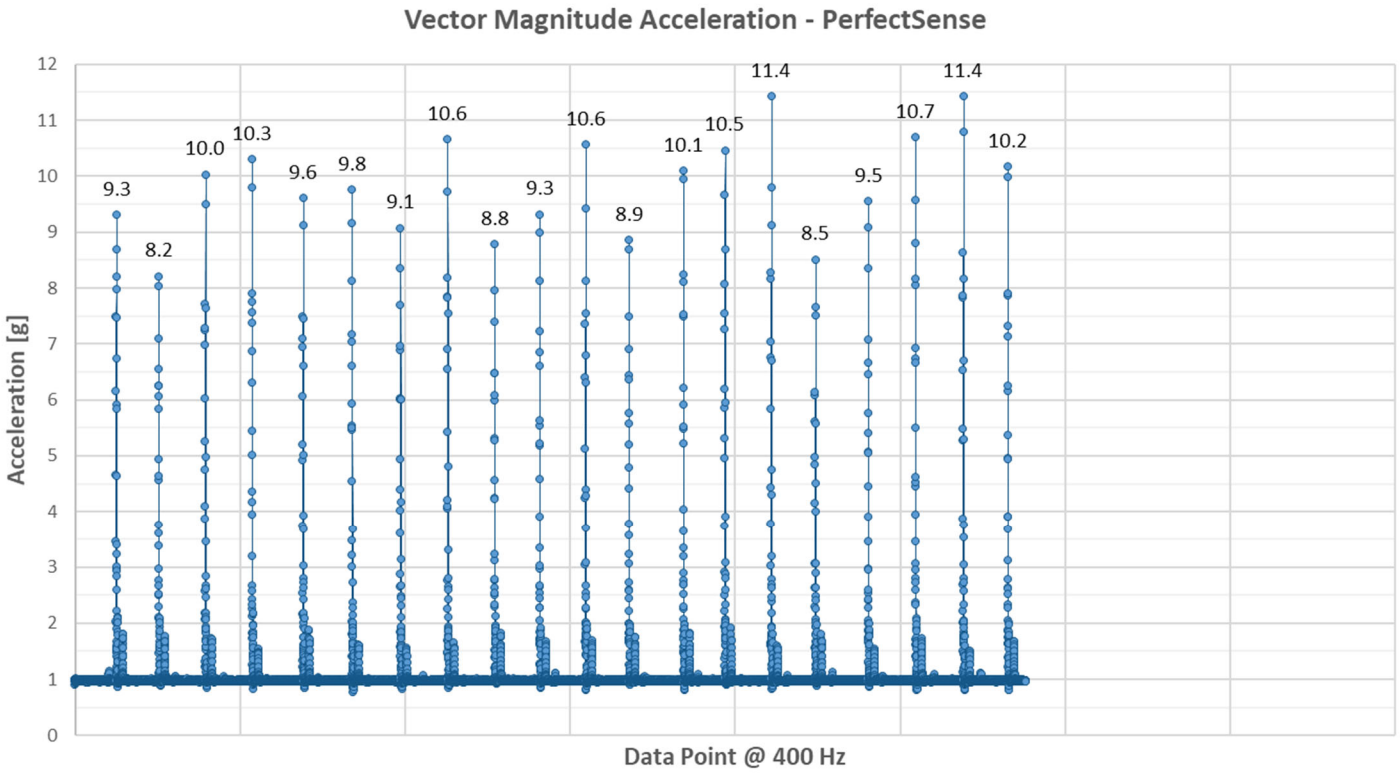


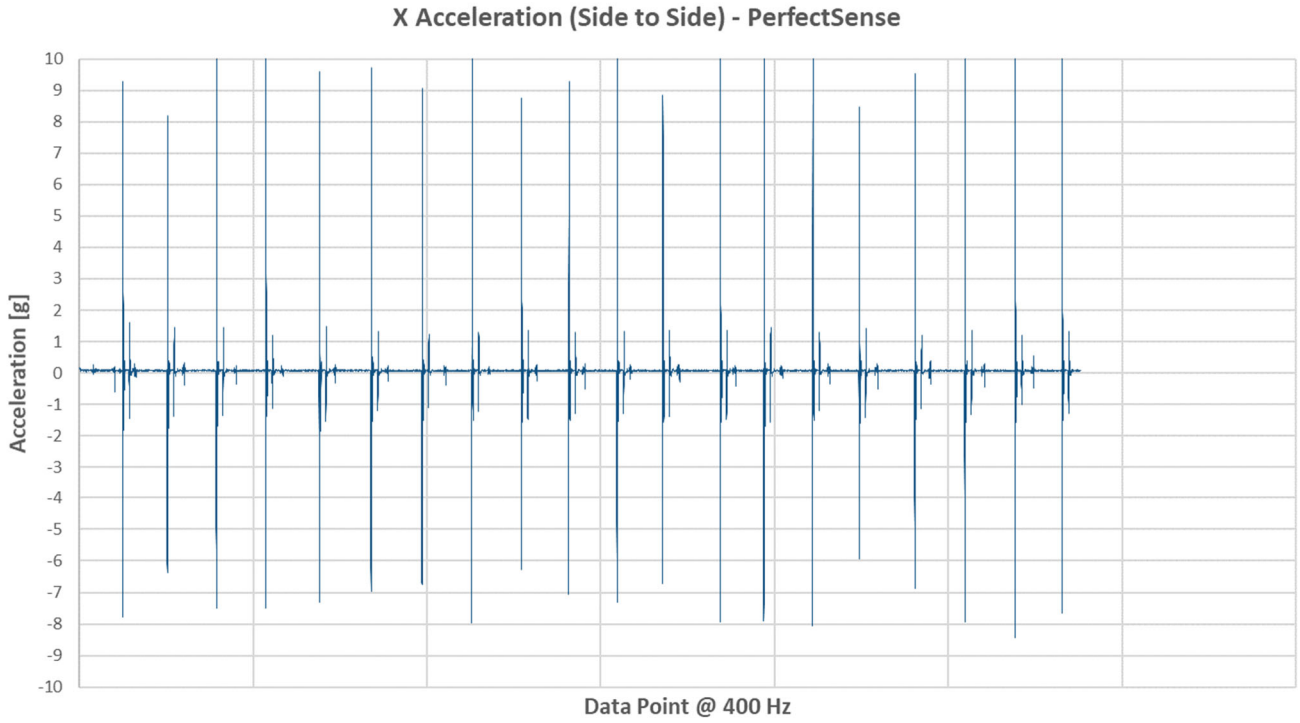


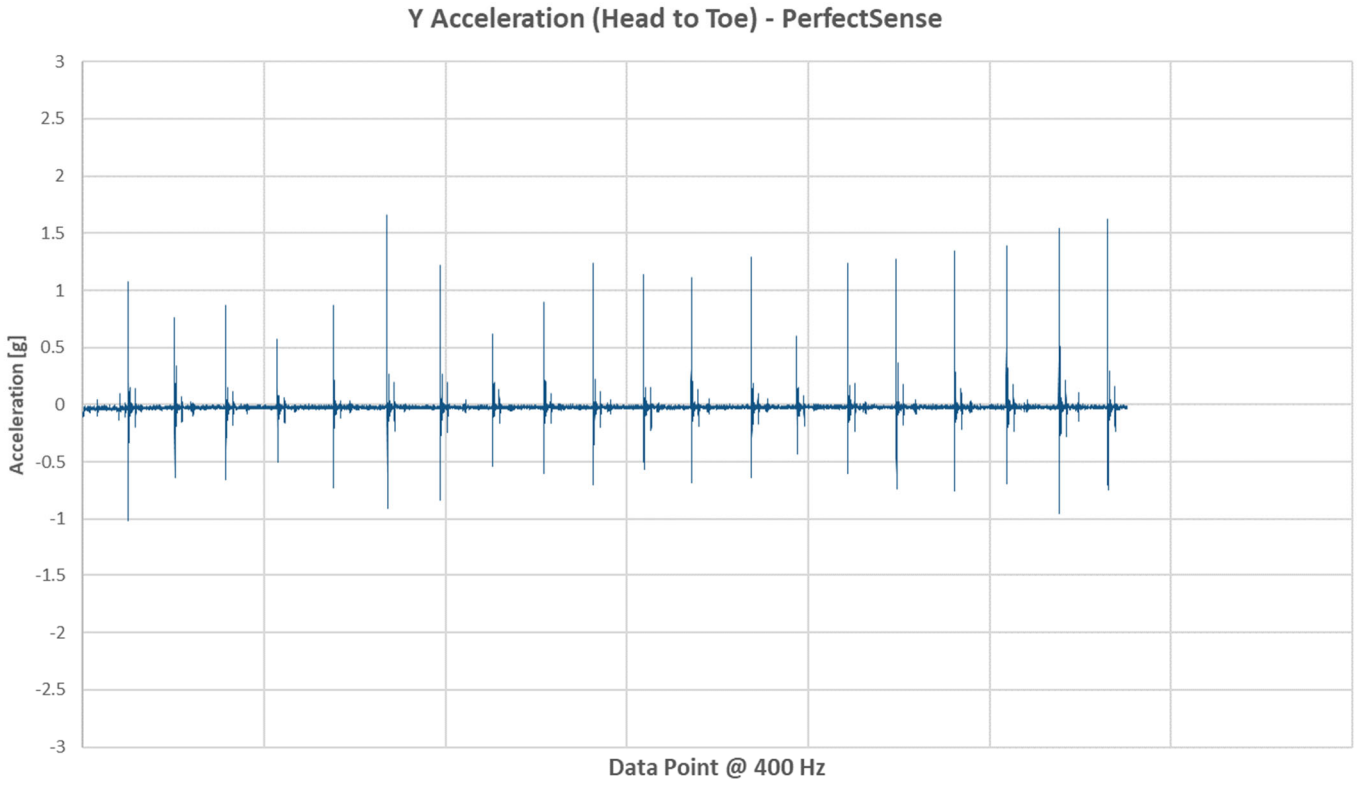

Y Acceleration (Head to Toe) - Structube
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

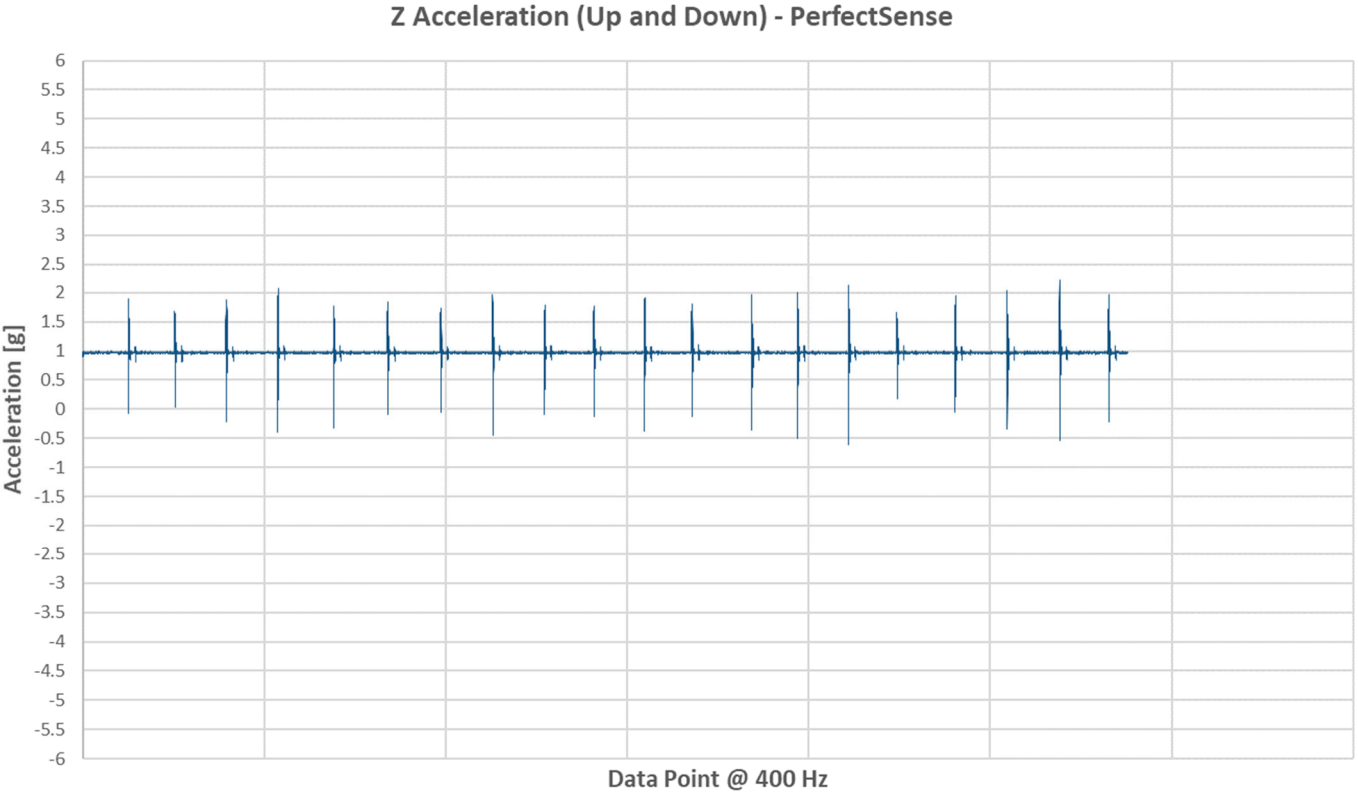

Z Acceleration (Up and Down) - Structube
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – PERFECTSENSE

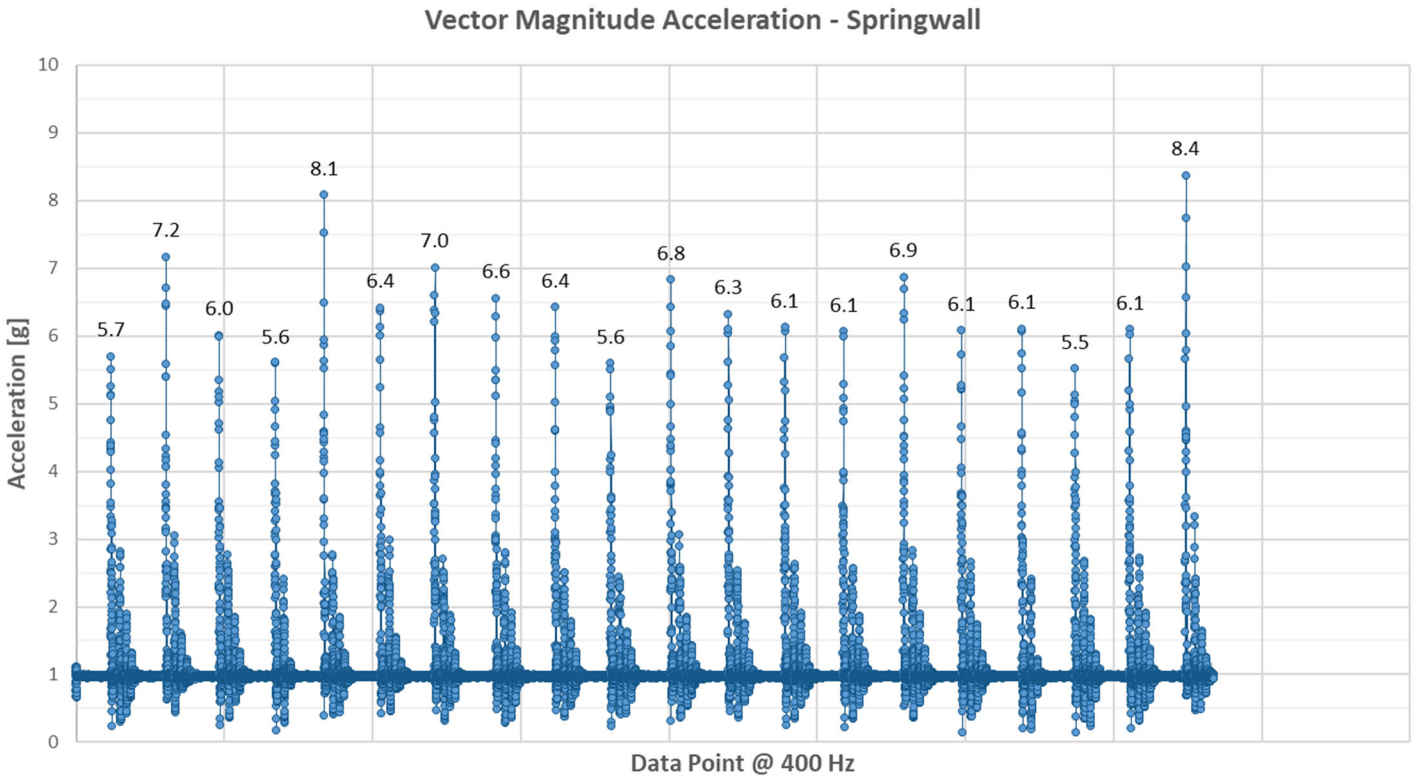


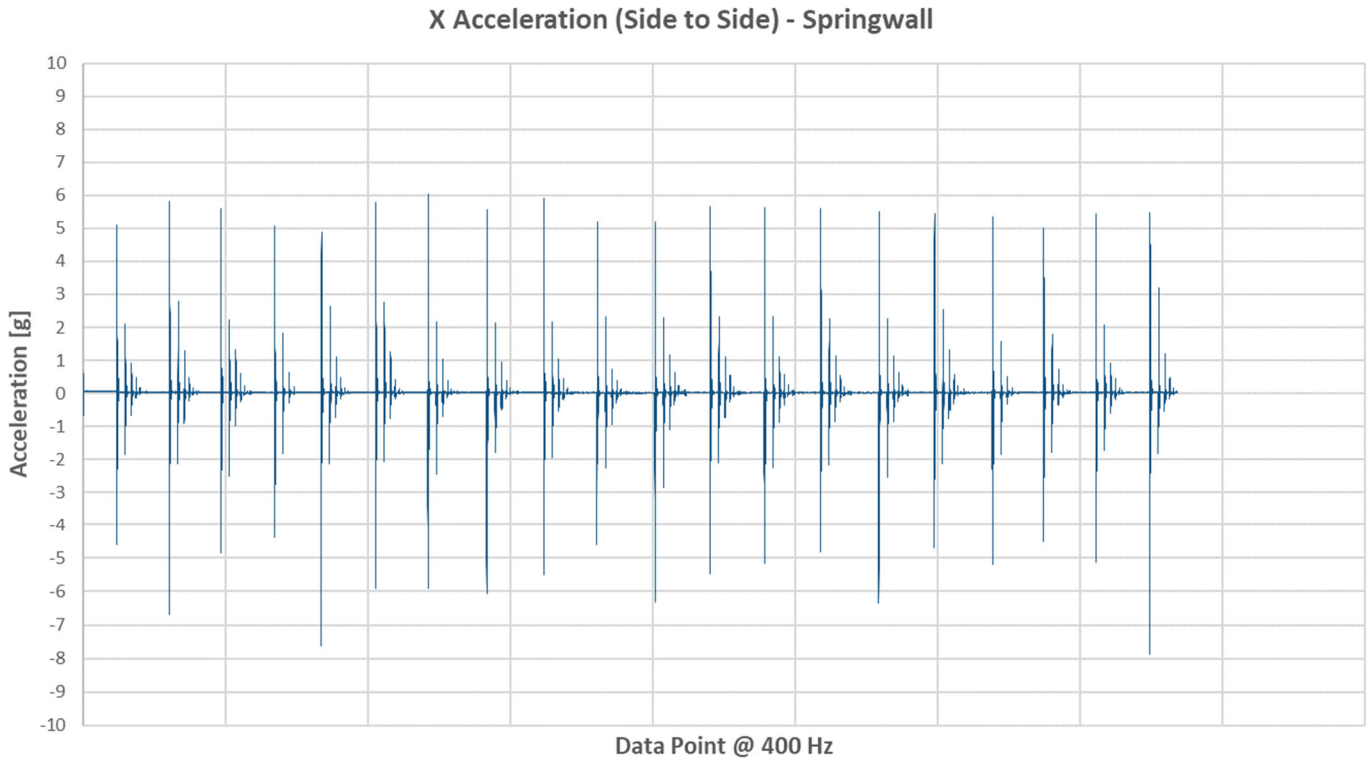


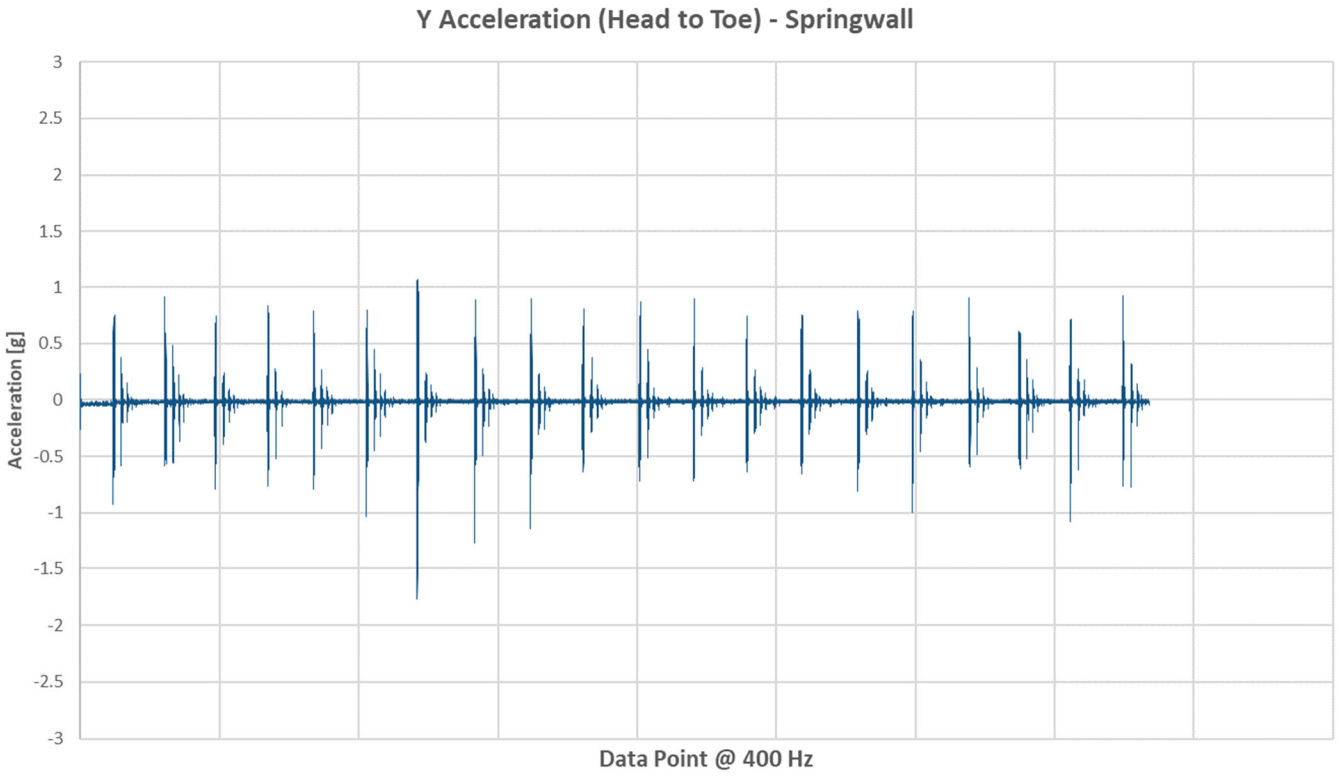

Y Acceleration (Head to Toe) - PerfectSense
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

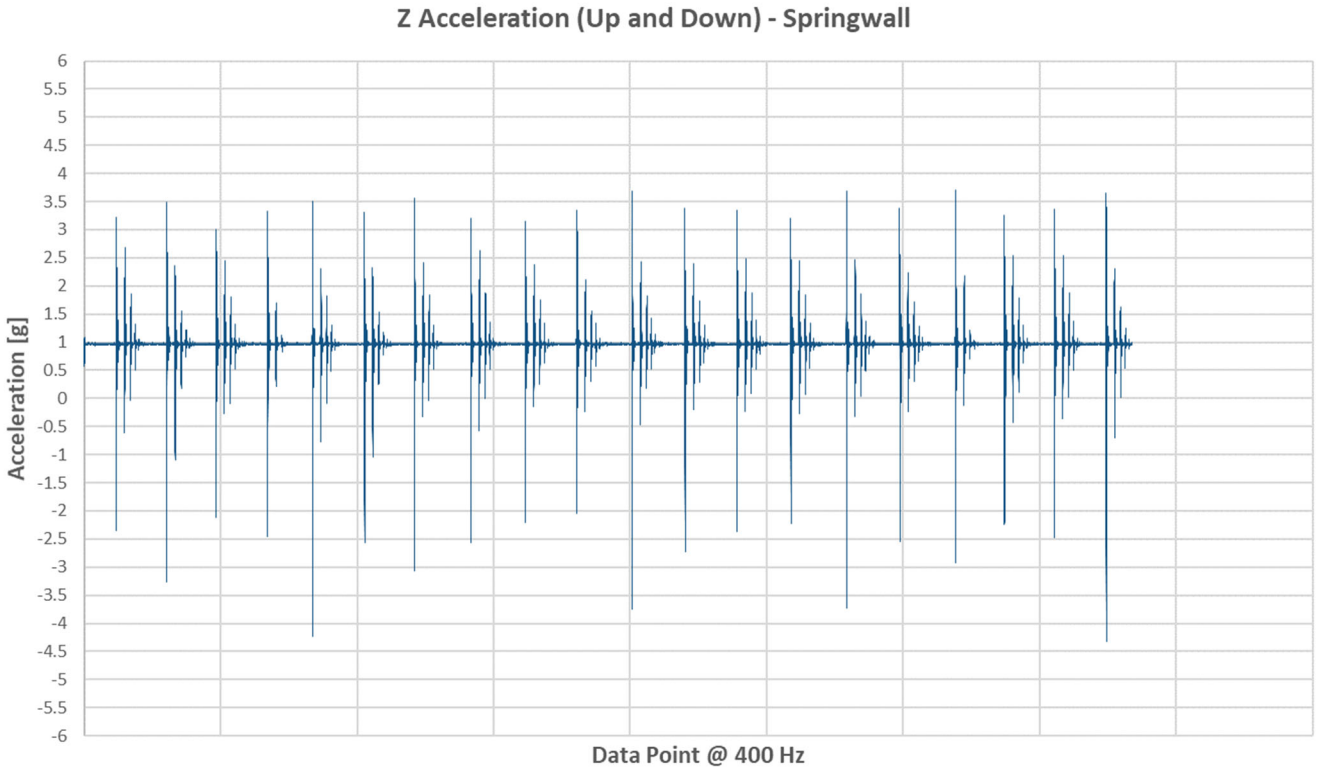

Z Acceleration (Up and Down) - PerfectSense
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – SPRINGWALL

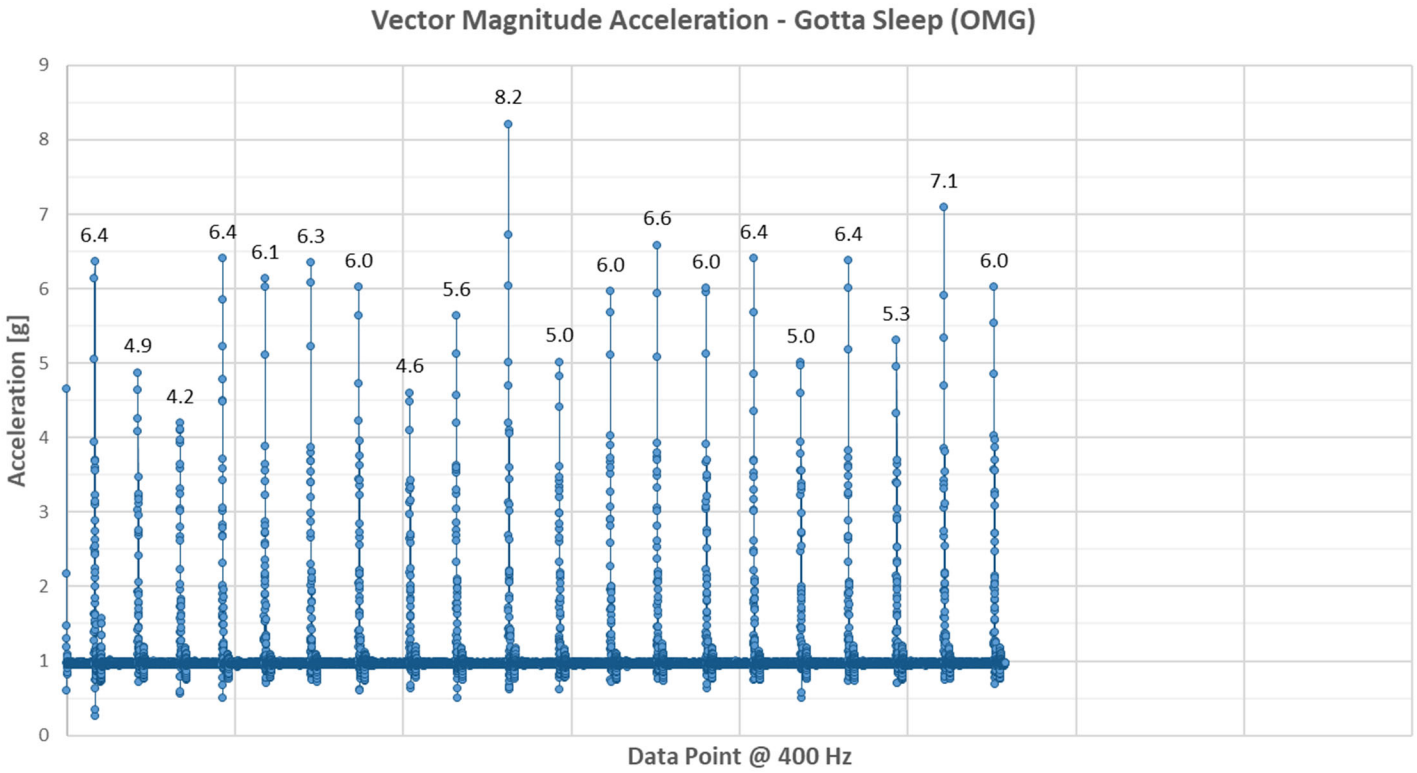


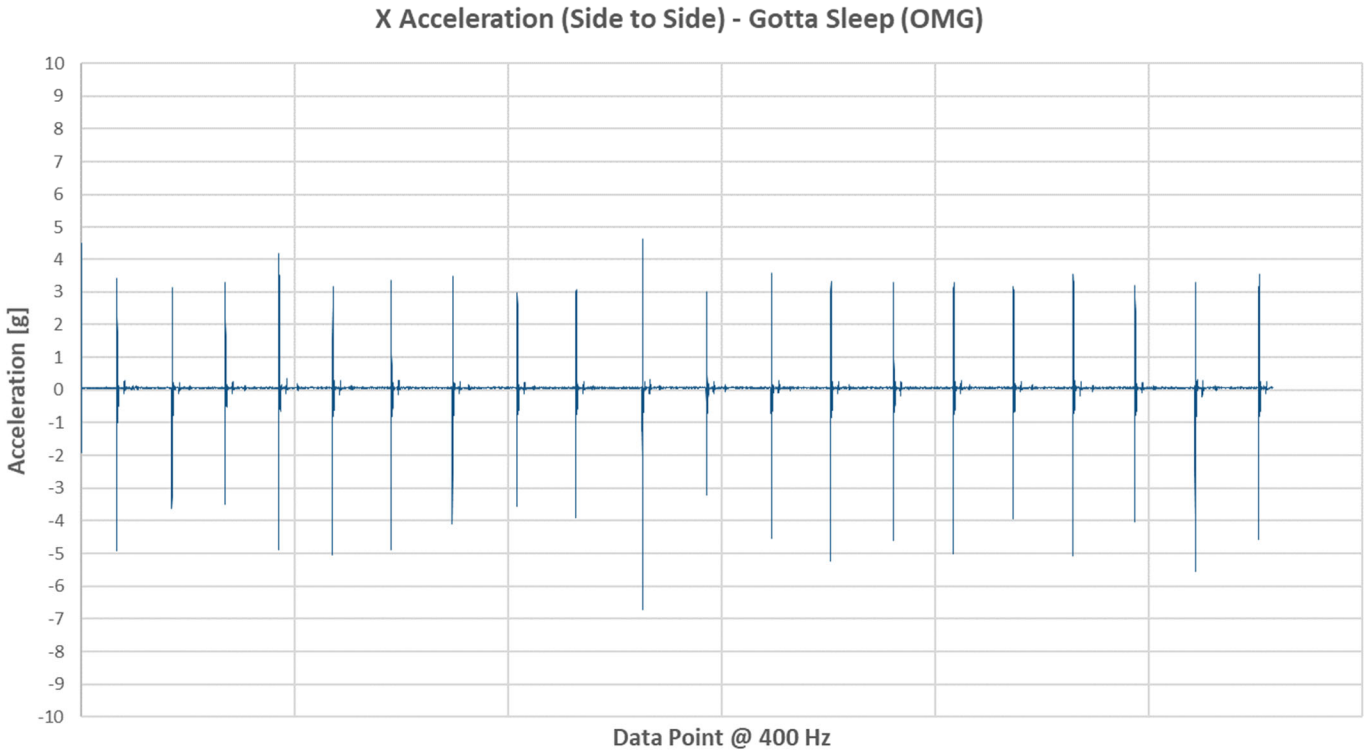


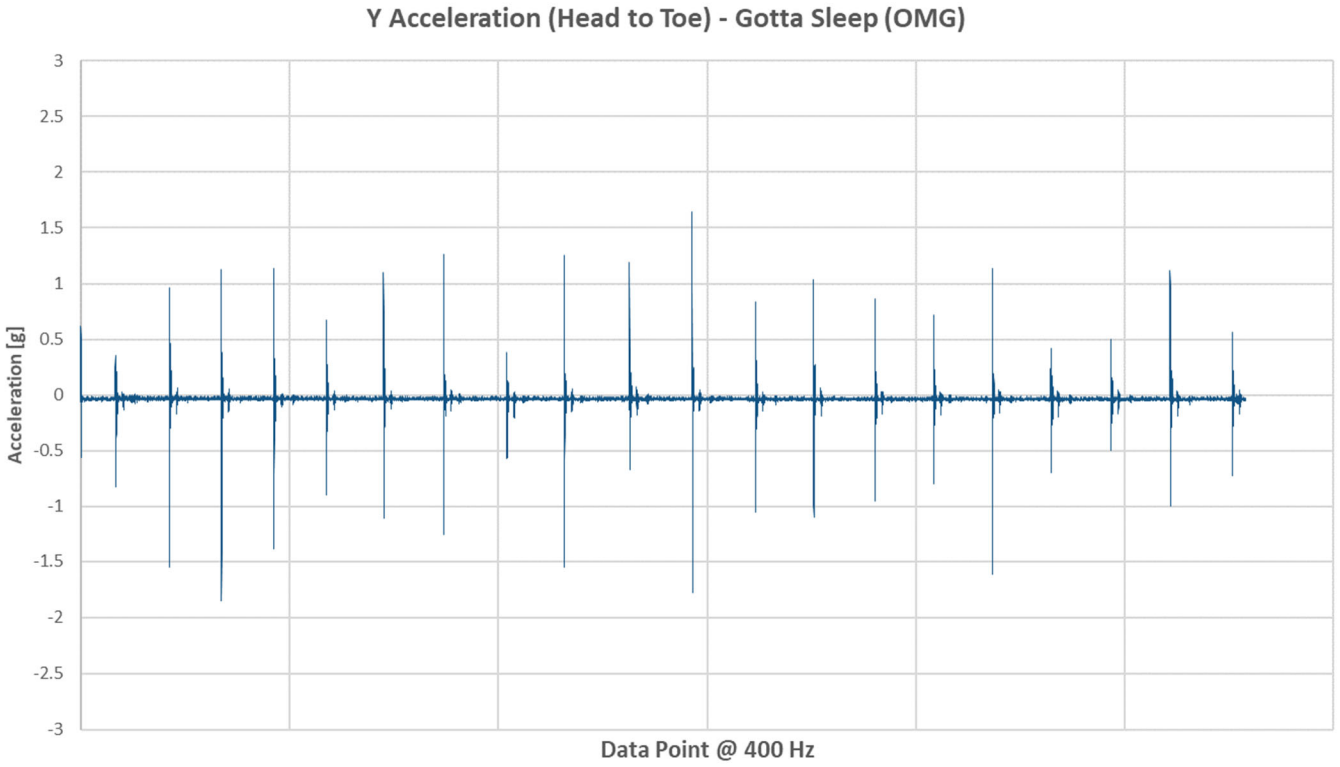

Y Acceleration (Head to Toe) - Springwall
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

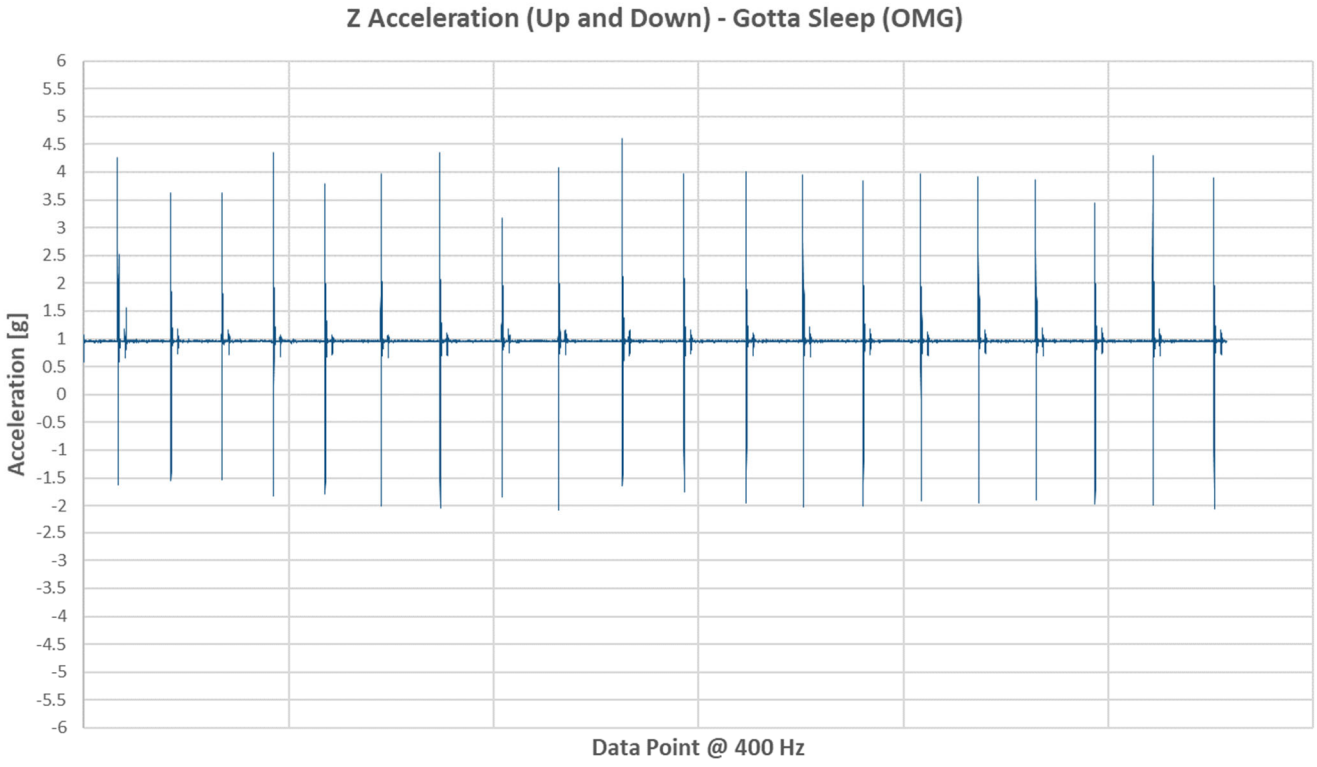

Z Acceleration (Up and Down) - Springwall
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – GOTTA SLEEP (OMG)

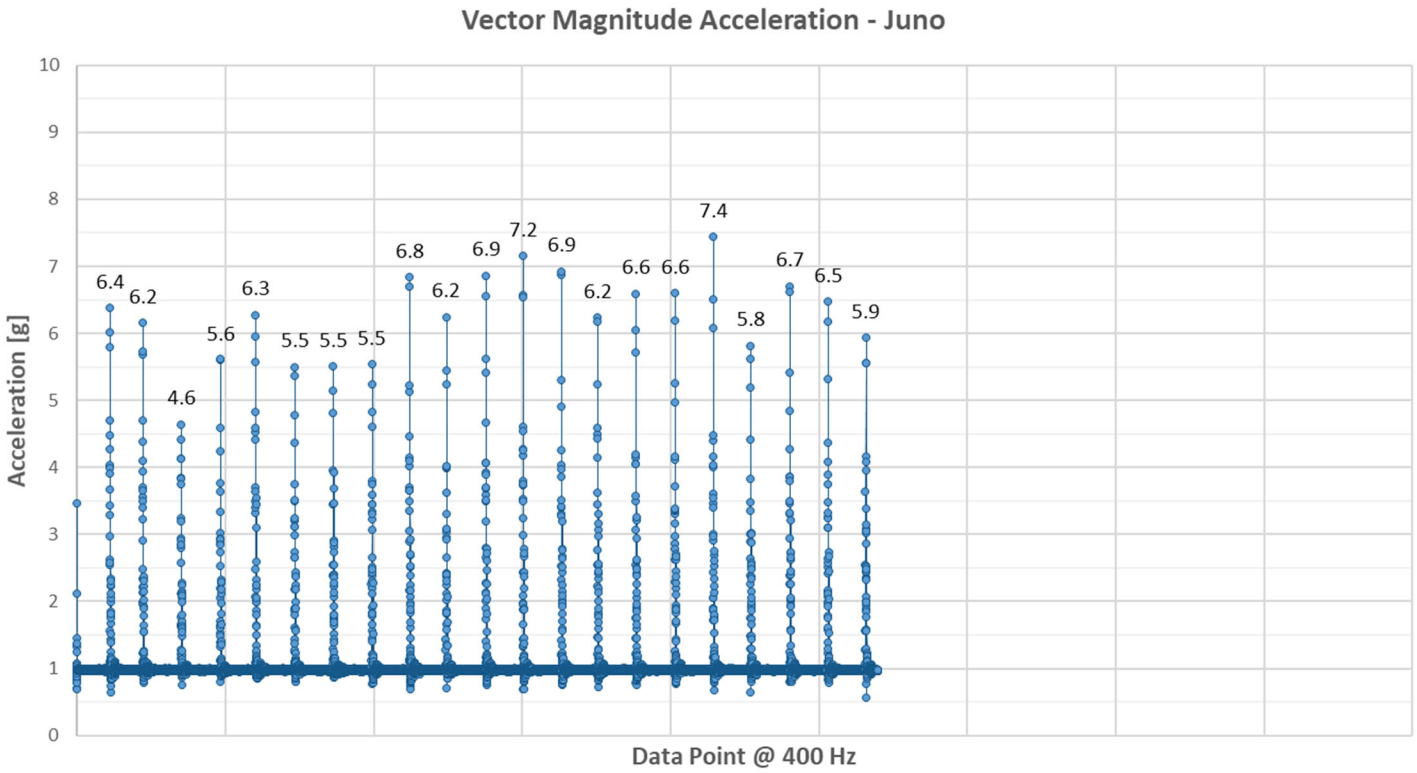


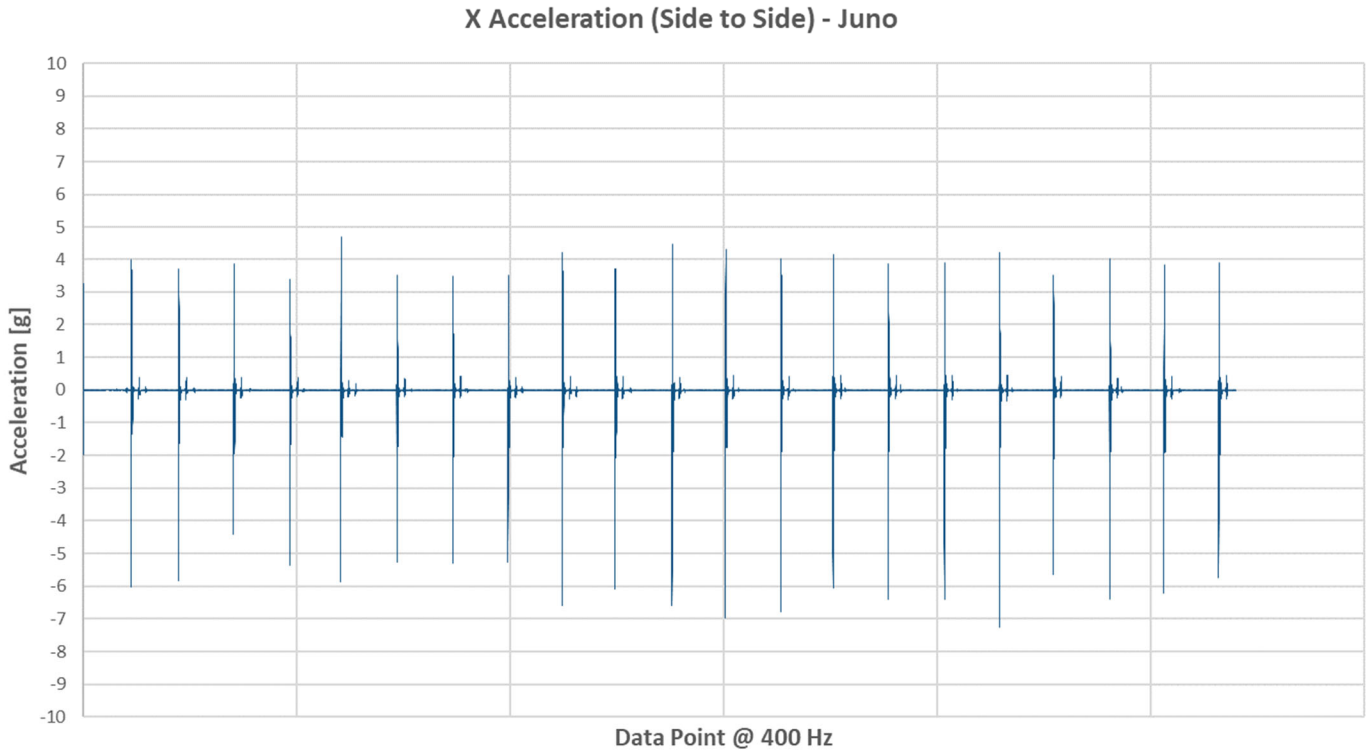


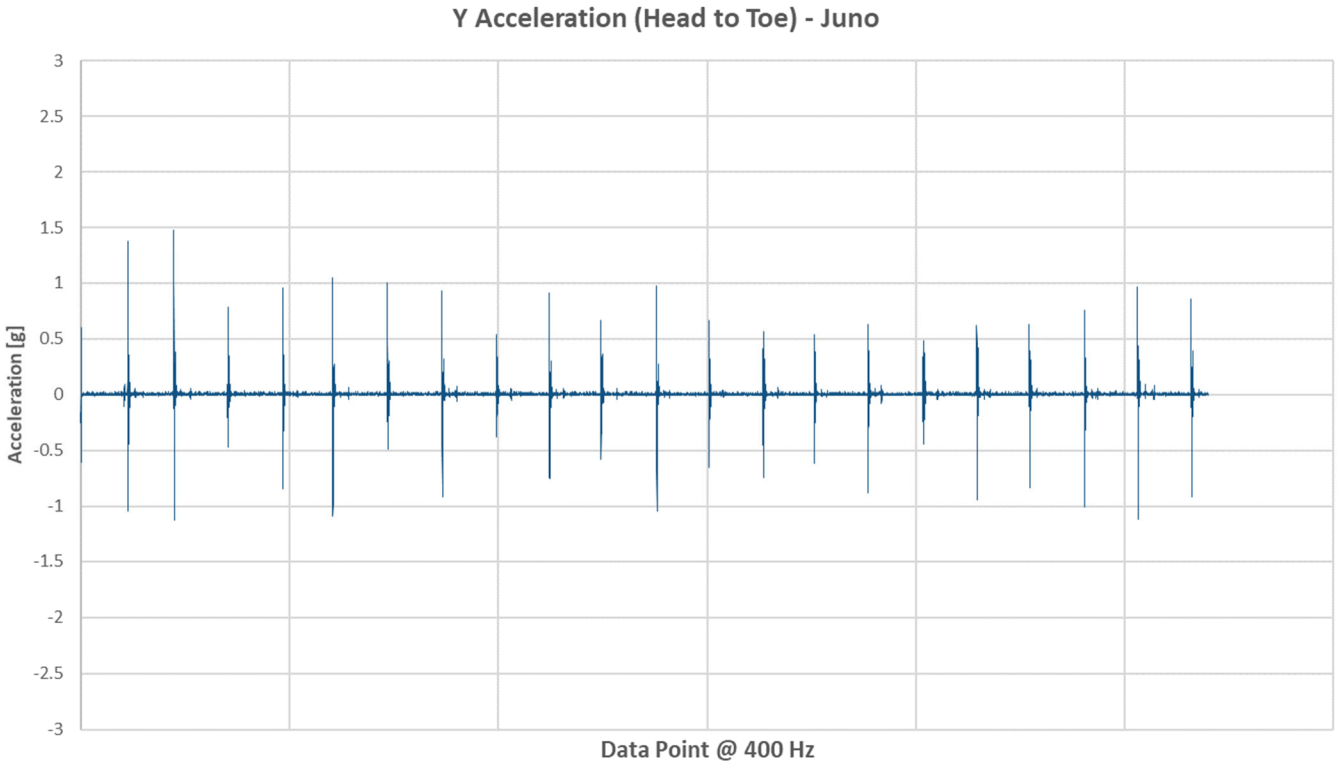

Y Acceleration (Head to Toe) - Gotta Sleep (OMG)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

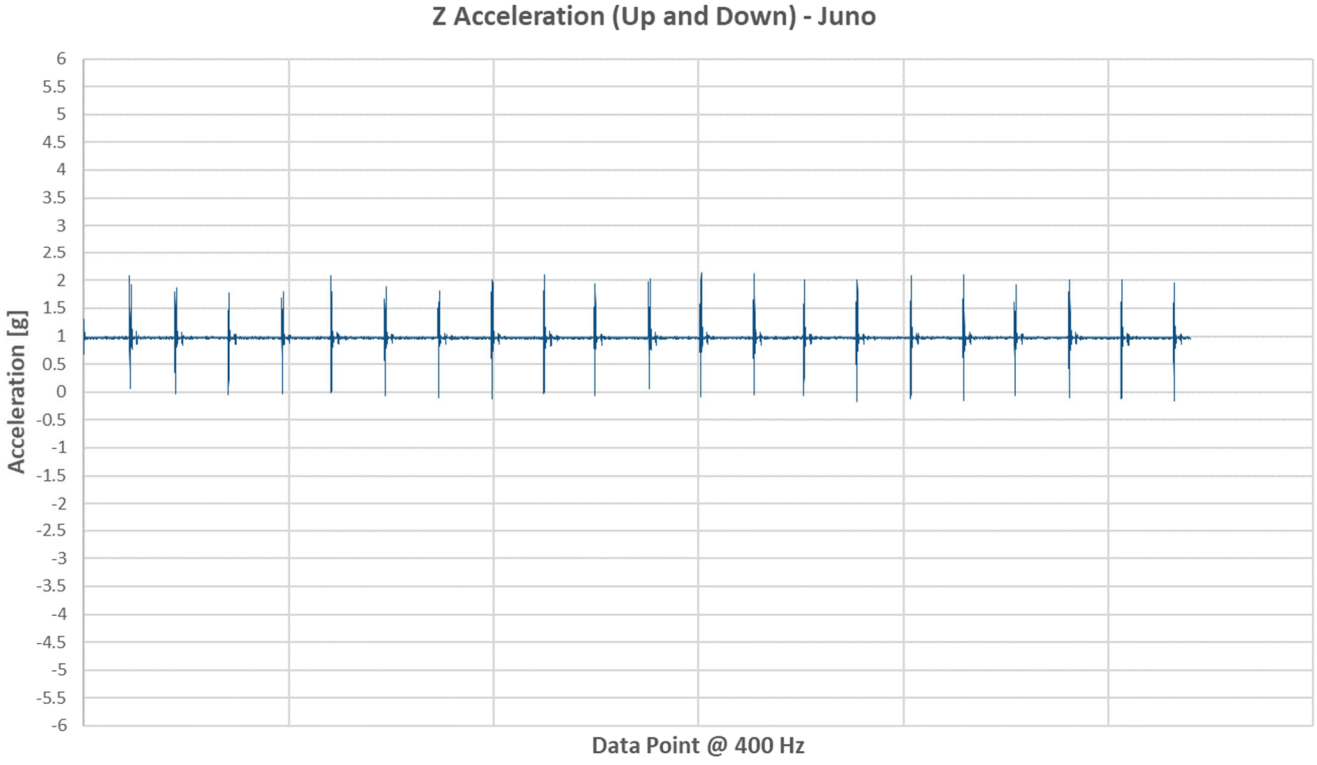

Z Acceleration (Up and Down) - Gotta Sleep (OMG)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – JUNO

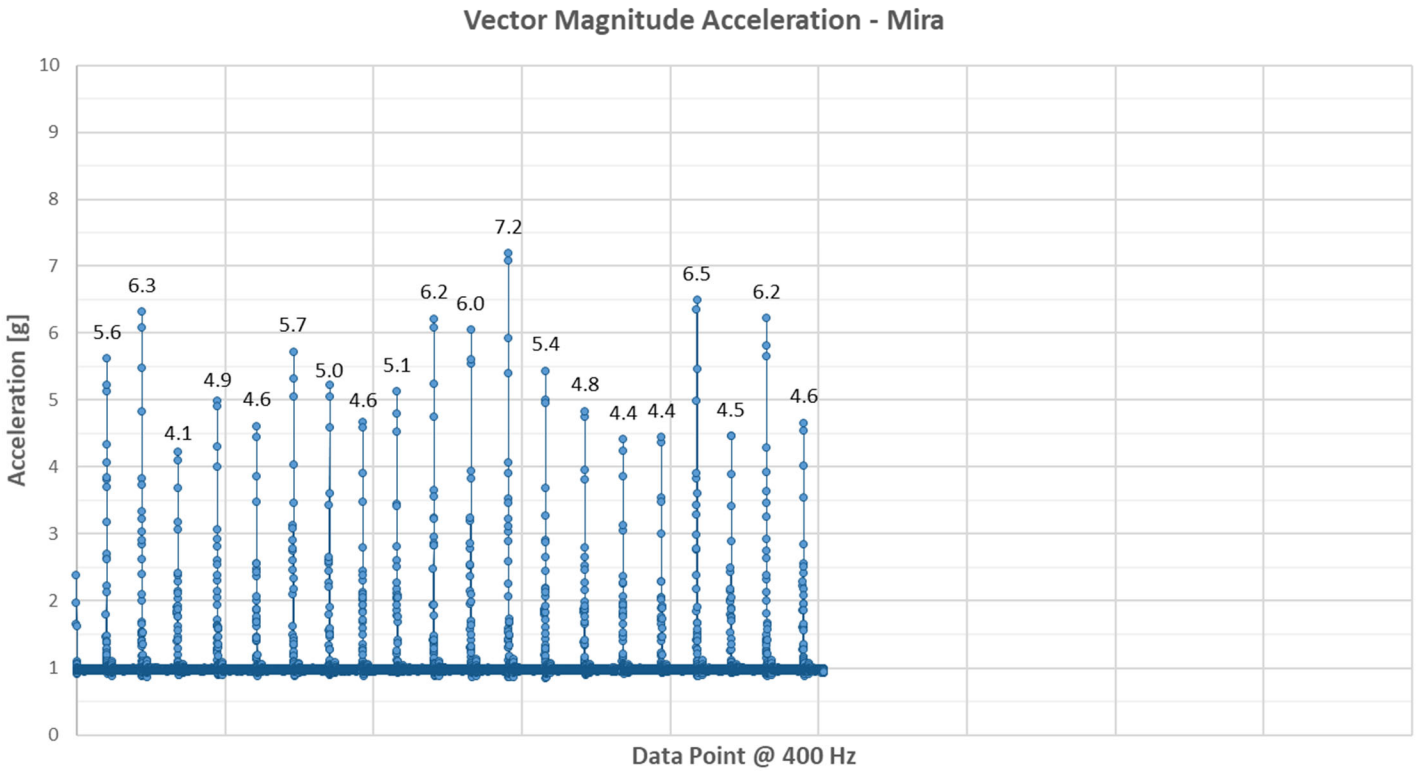

Vector Magnitude Acceleration - Juno
Acceleration [g]
Data Point @ 400 Hz
6.4
6.2
4.6
5.6
6.3
5.5
5.5
5.5
6.8
6.2
6.9
7.2
6.9
6.2
6.6
6.6
7.4
5.8
6.7
6.5
5.9

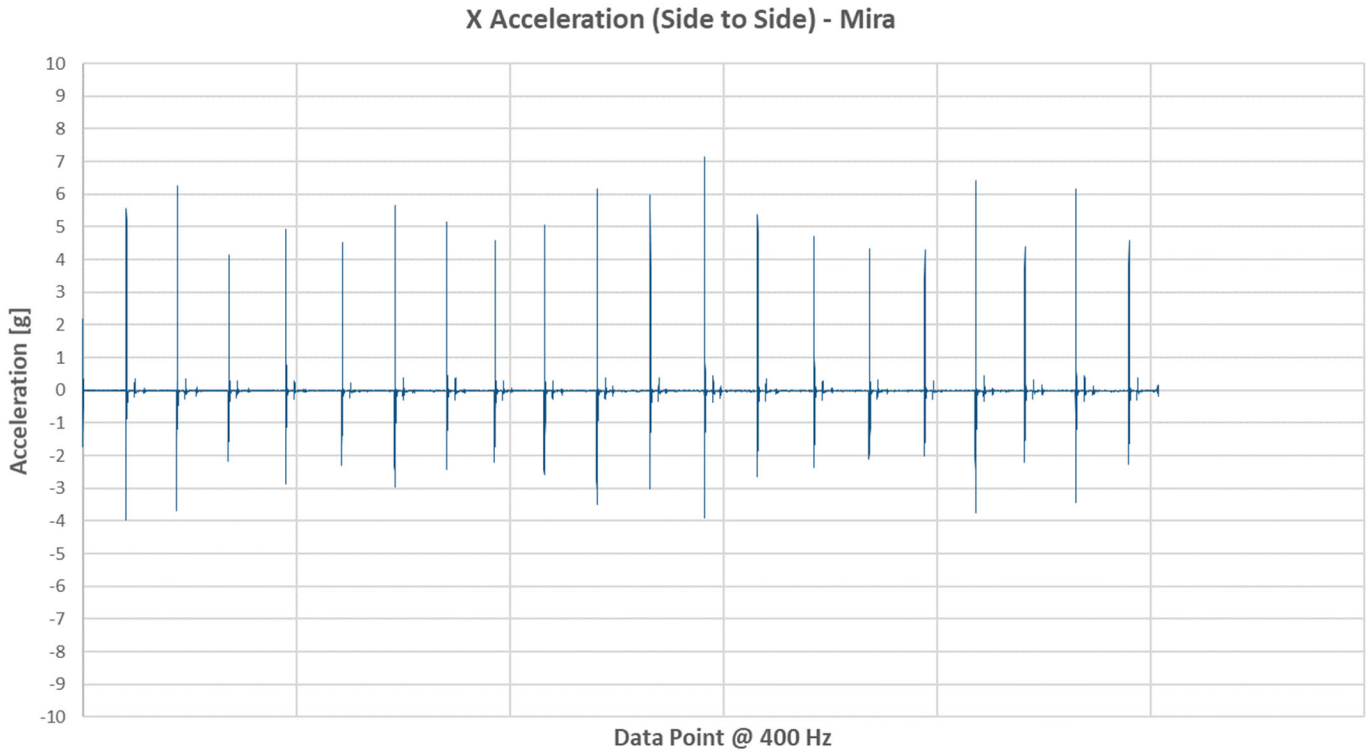

X Acceleration (Side to Side) - Juno
Acceleration [g]
Data Point @ 400 Hz

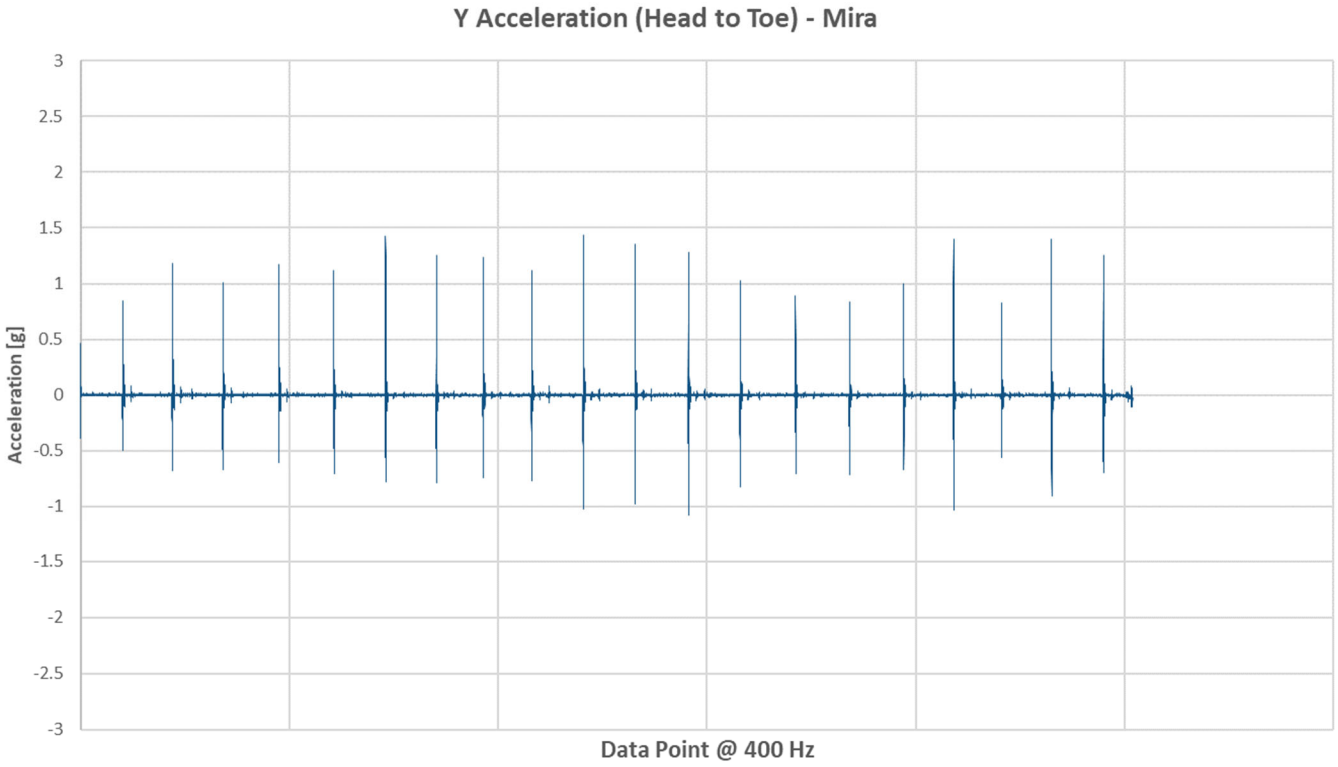

Y Acceleration (Head to Toe) - Juno
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

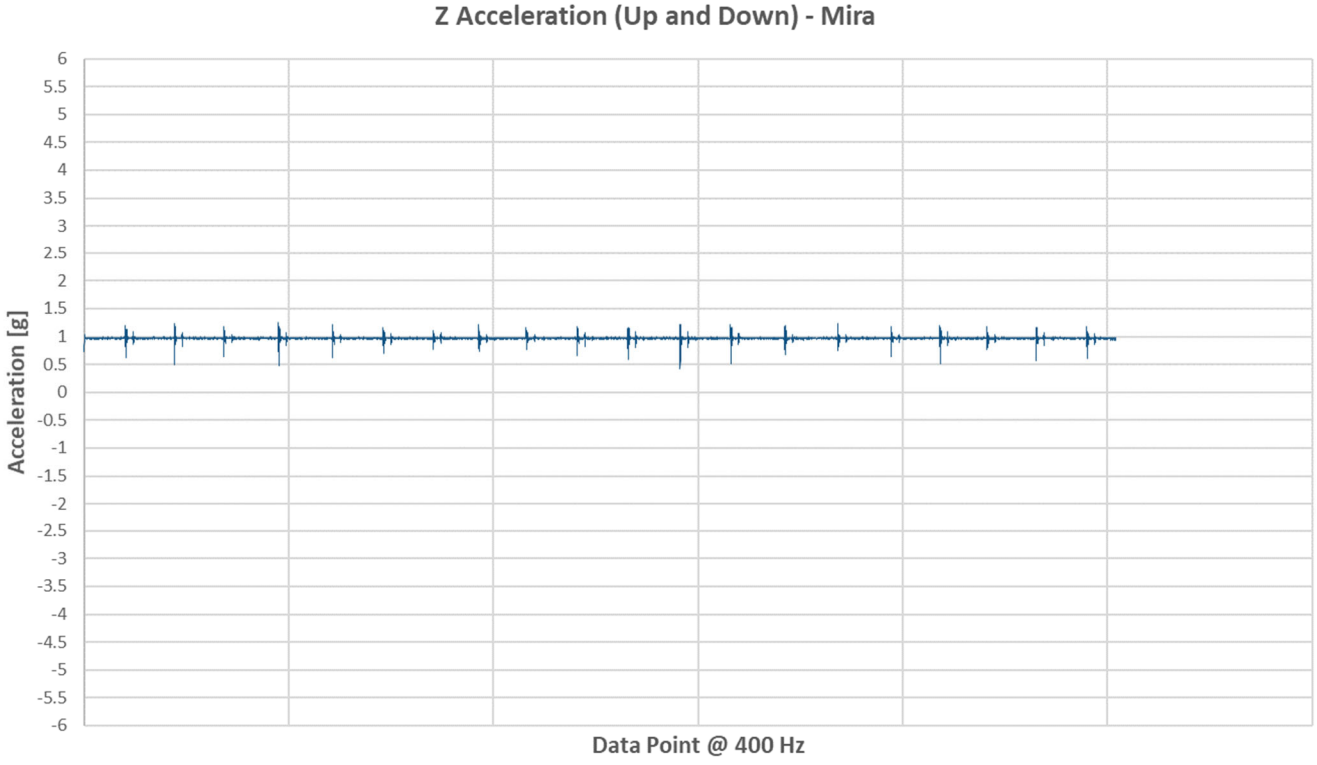

Z Acceleration (Up and Down) - Juno
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – MIRA

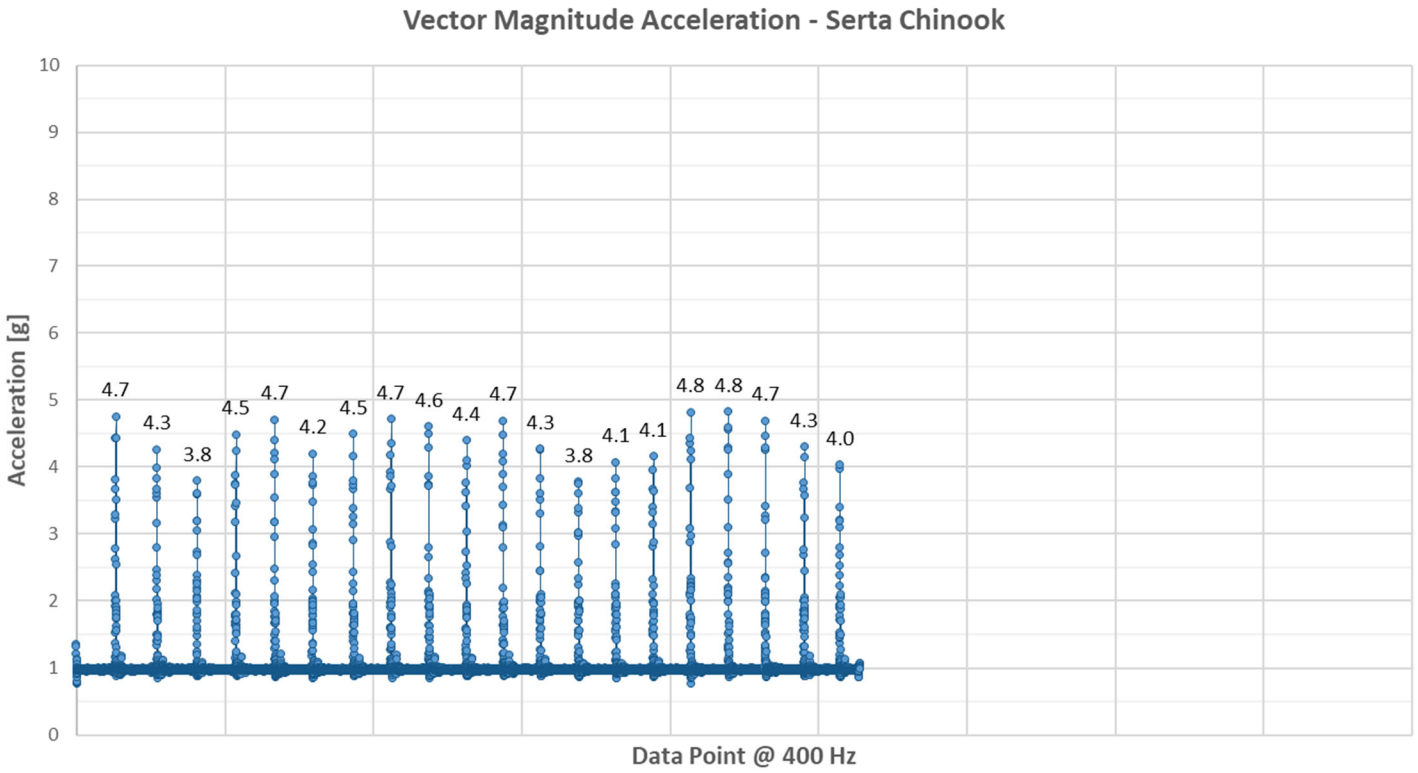

Vector Magnitude Acceleration - Mira
Acceleration [g]
Data Point @ 400 Hz
5.6
6.3
4.1
4.9
4.6
5.7
5.0
4.6
5.1
6.2
6.0
7.2
5.4
4.8
4.4
4.4
6.5
4.5
6.2
4.6

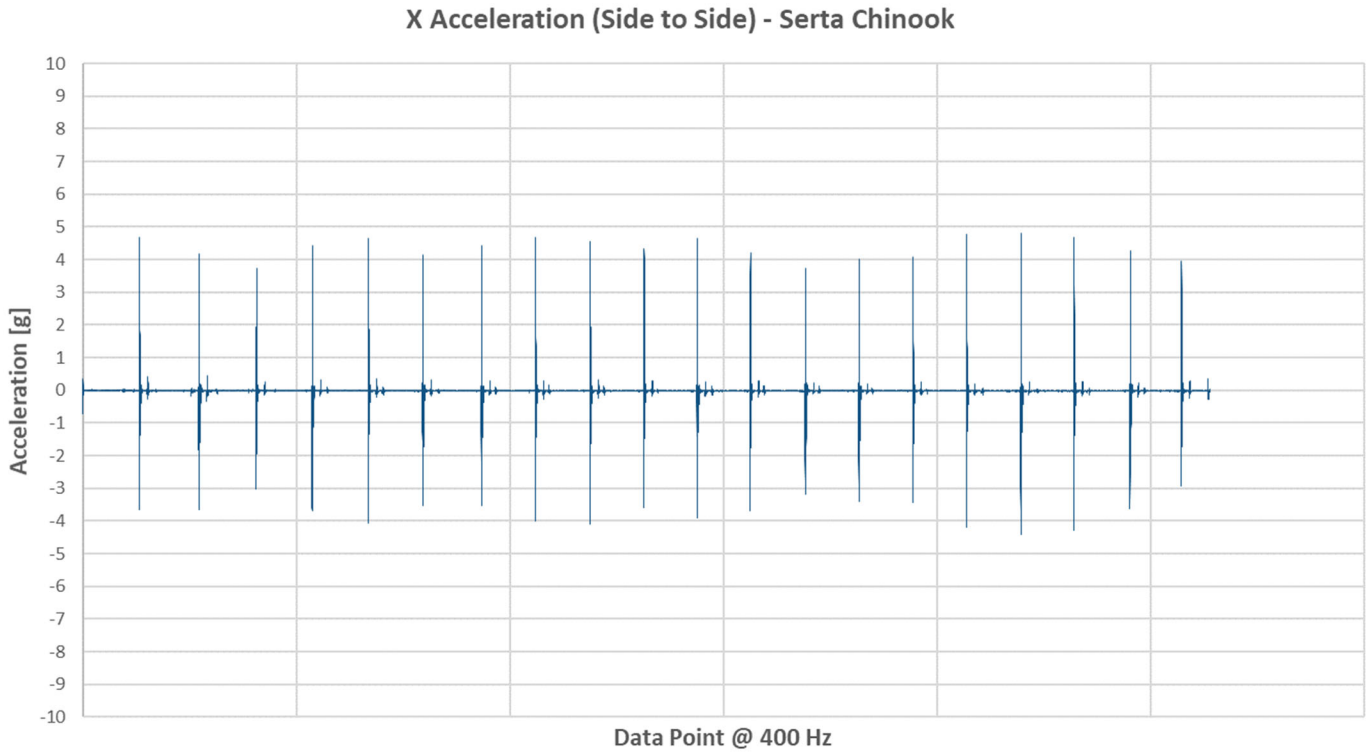

X Acceleration (Side to Side) - Mira
Acceleration [g]
Data Point @ 400 Hz

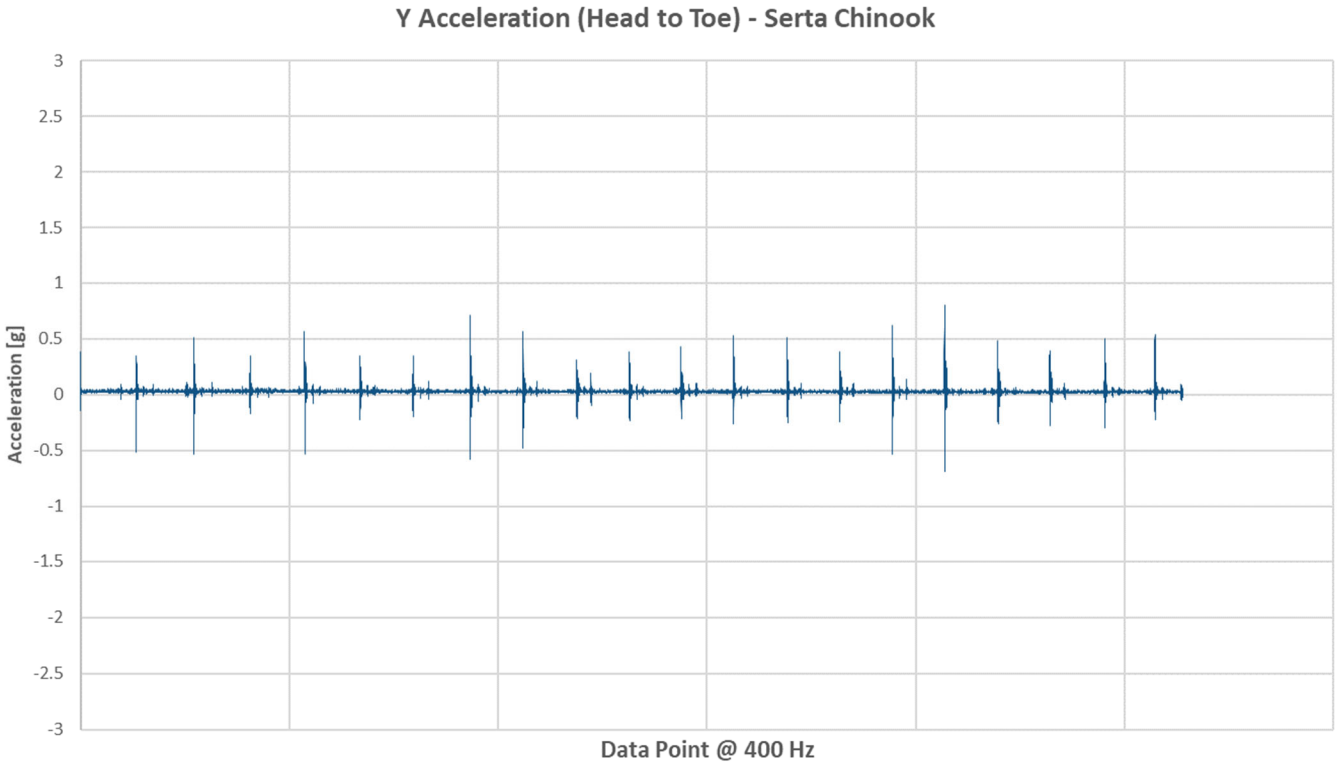

Y Acceleration (Head to Toe) - Mira
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

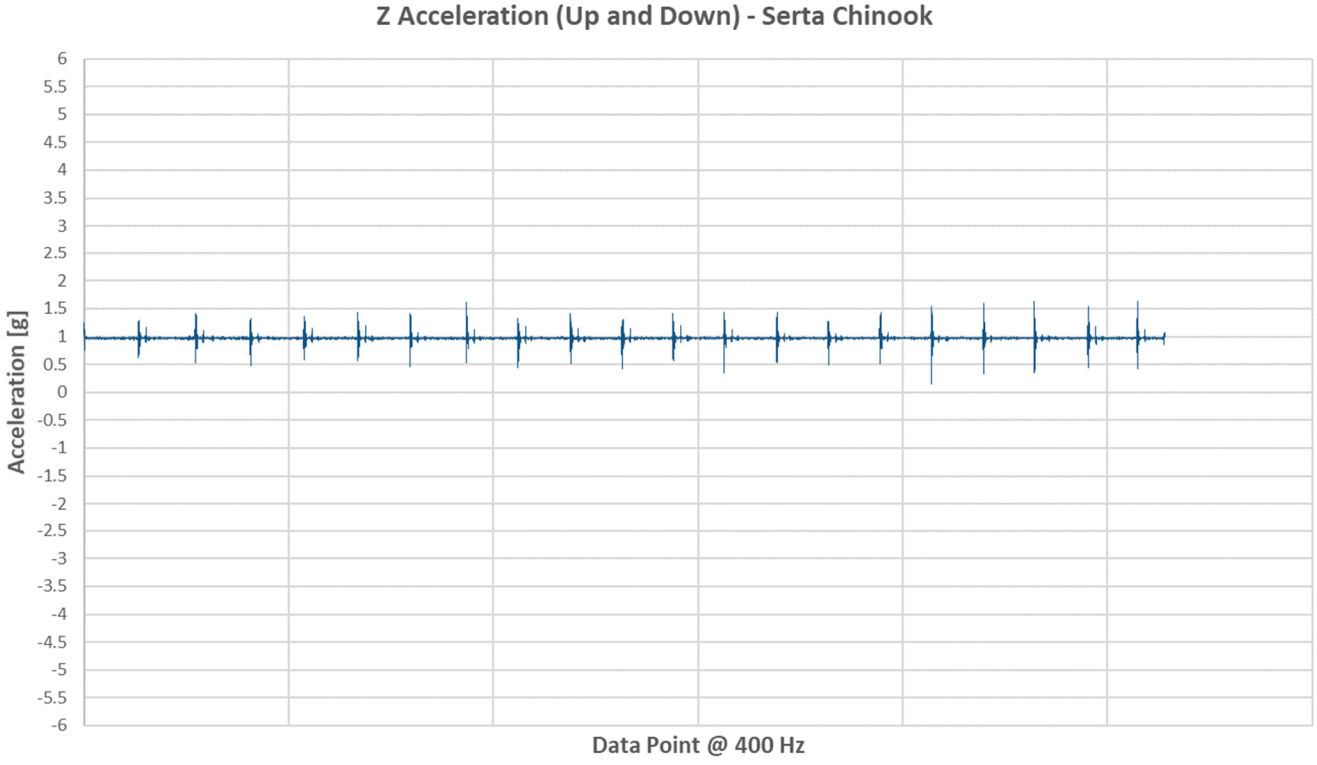

Z Acceleration (Up and Down) - Mira
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – SERTA CHINOOK

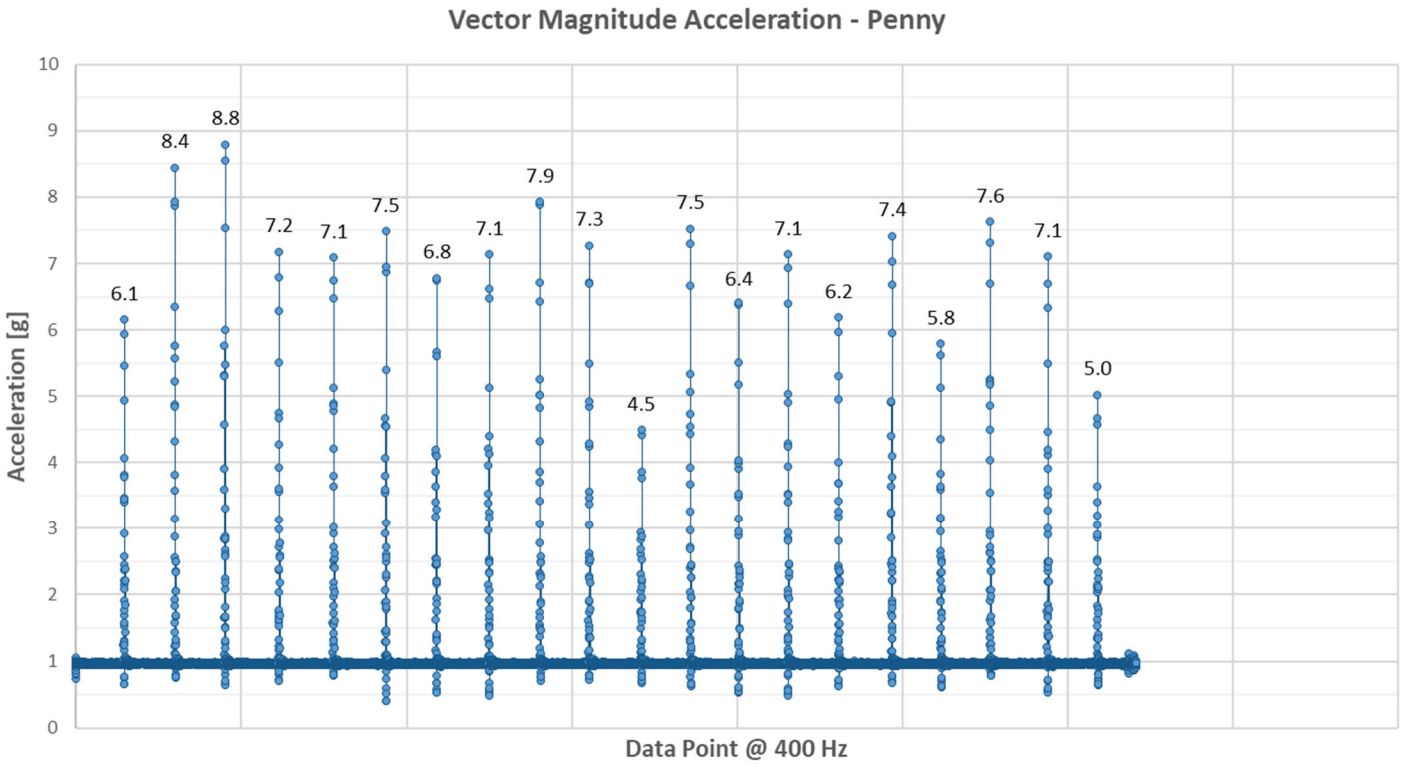


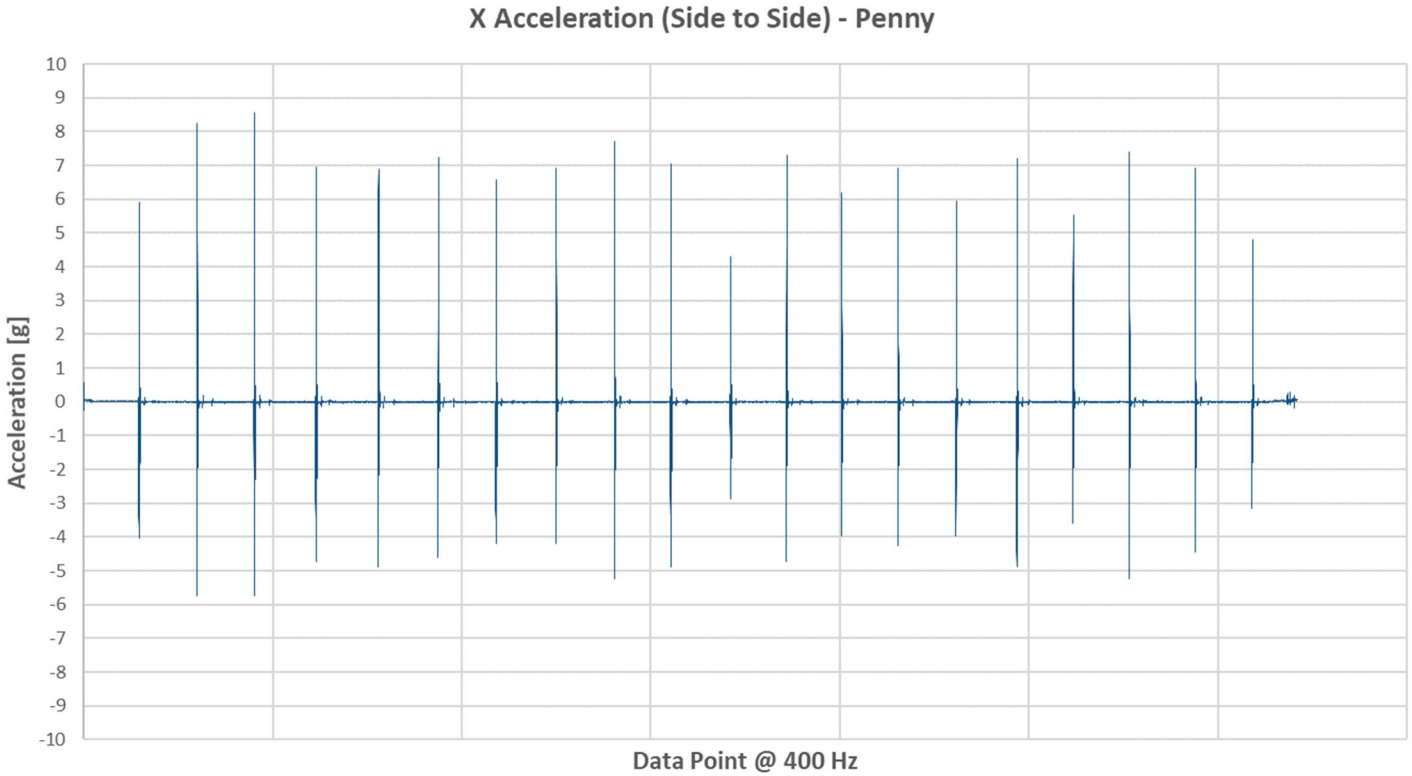


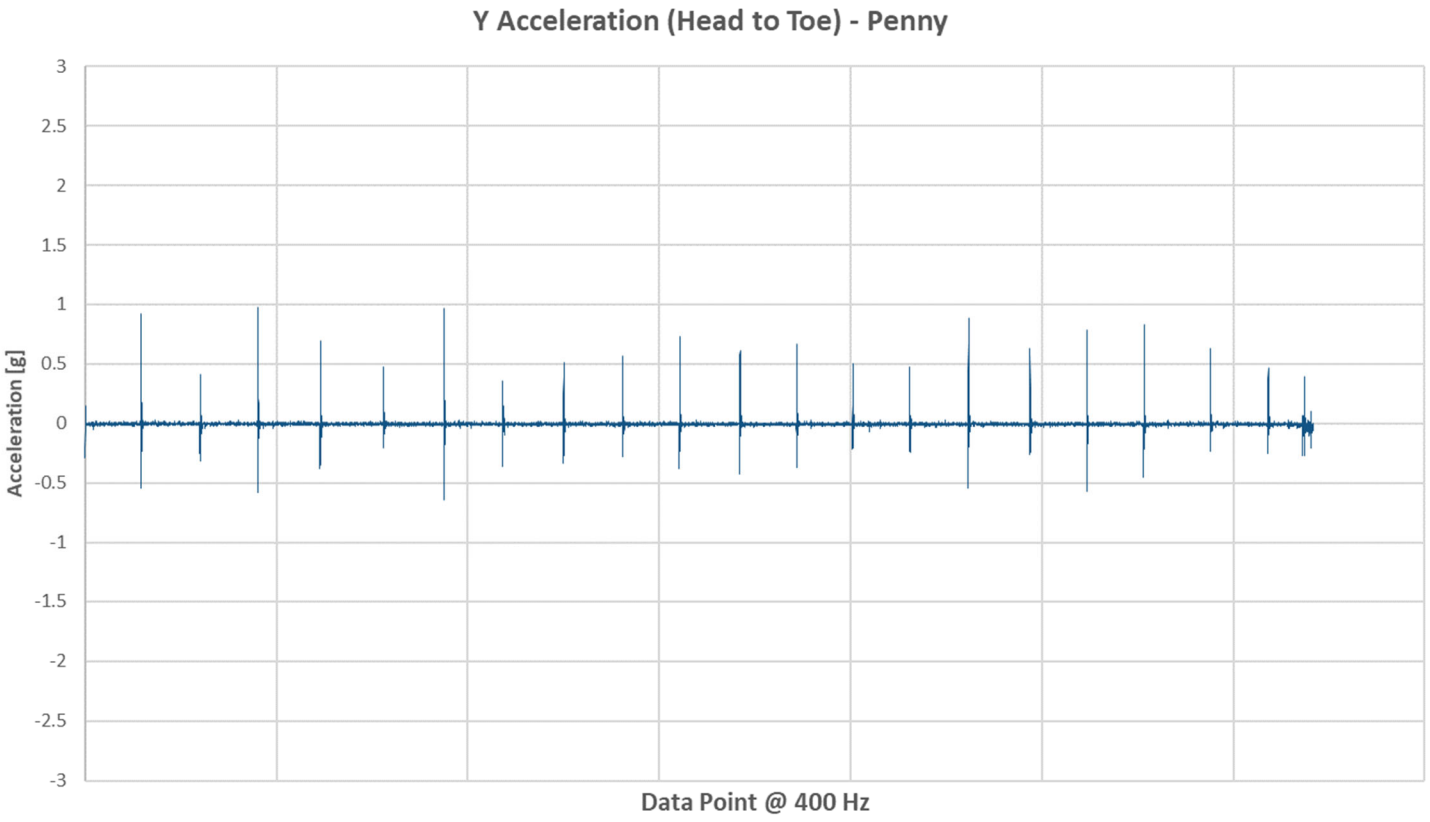

Y Acceleration (Head to Toe) - Serta Chinook
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

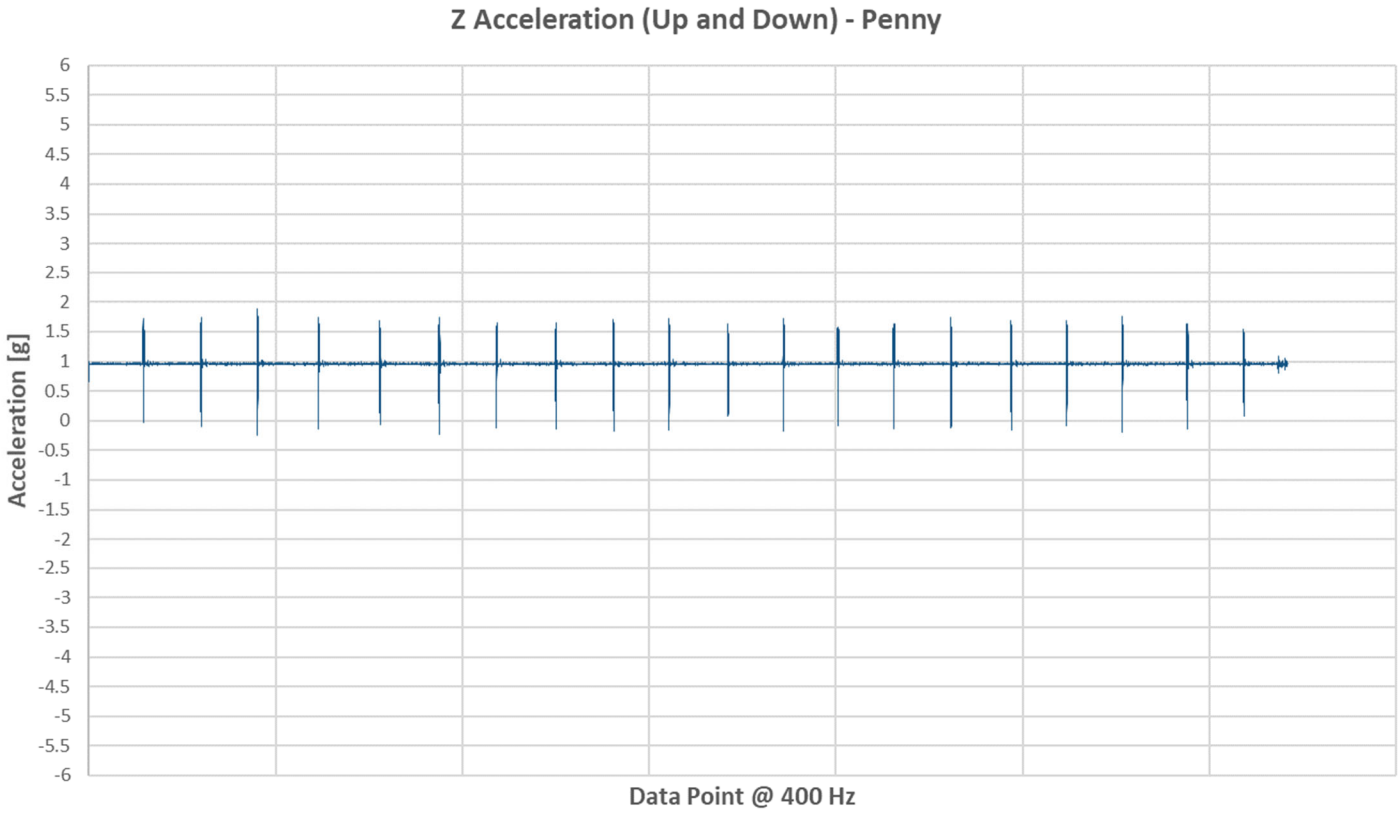

Z Acceleration (Up and Down) - Serta Chinook
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – PENNY

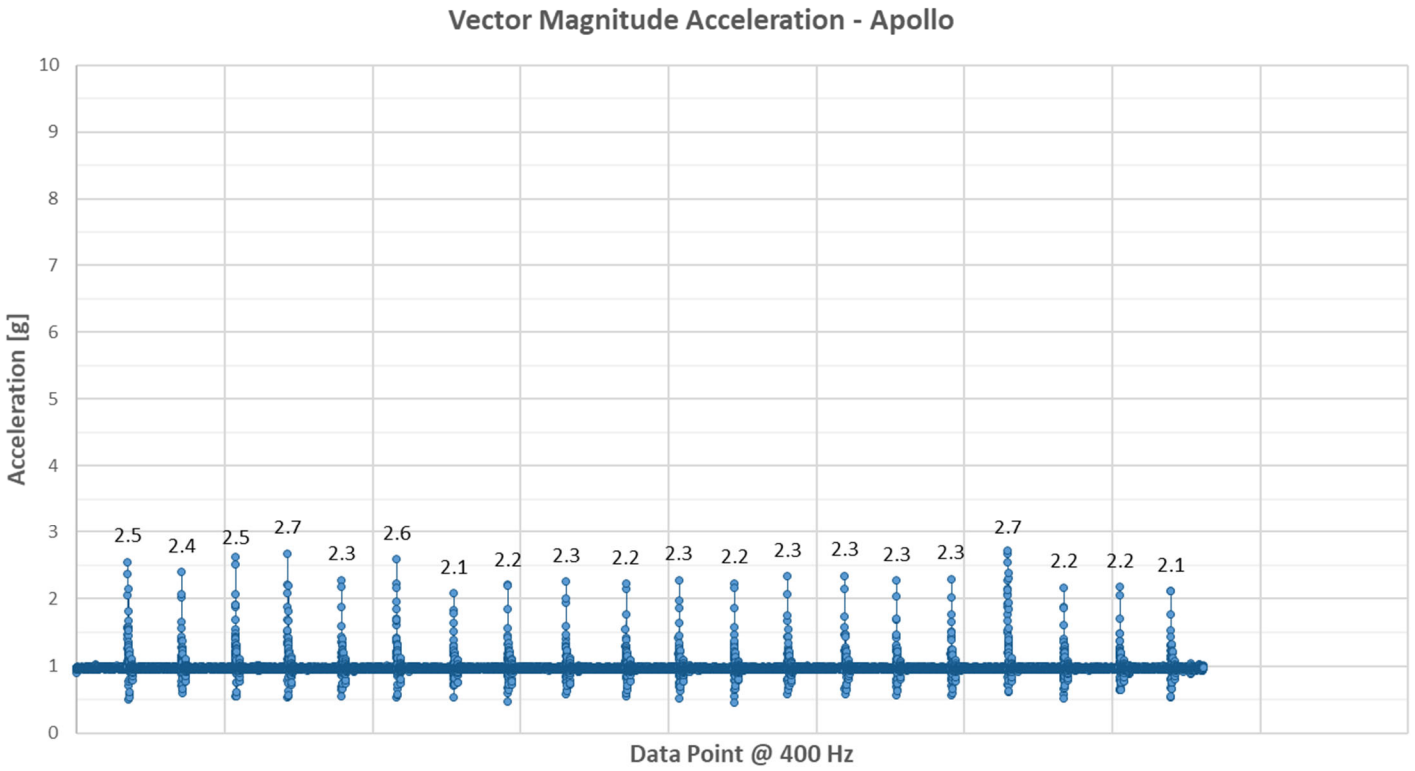

Vector Magnitude Acceleration - Penny
Acceleration [g]
Data Point @ 400 Hz
6.1
8.4
8.8
7.2
7.1
7.5
6.8
7.1
7.9
7.3
4.5
7.5
6.4
7.1
6.2
7.4
5.8
7.6
7.1
5.0

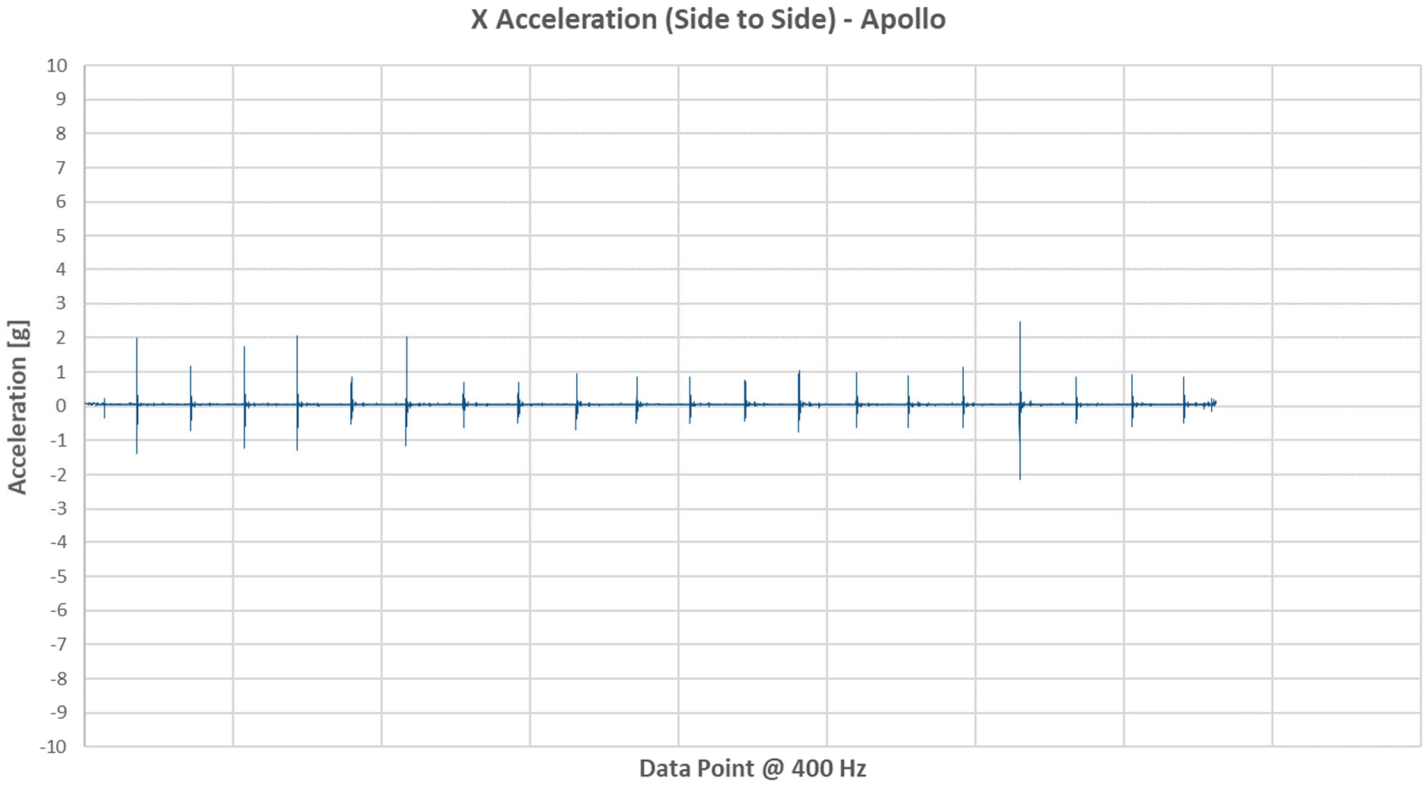

X Acceleration (Side to Side) - Penny
Acceleration [g]
Data Point @ 400 Hz

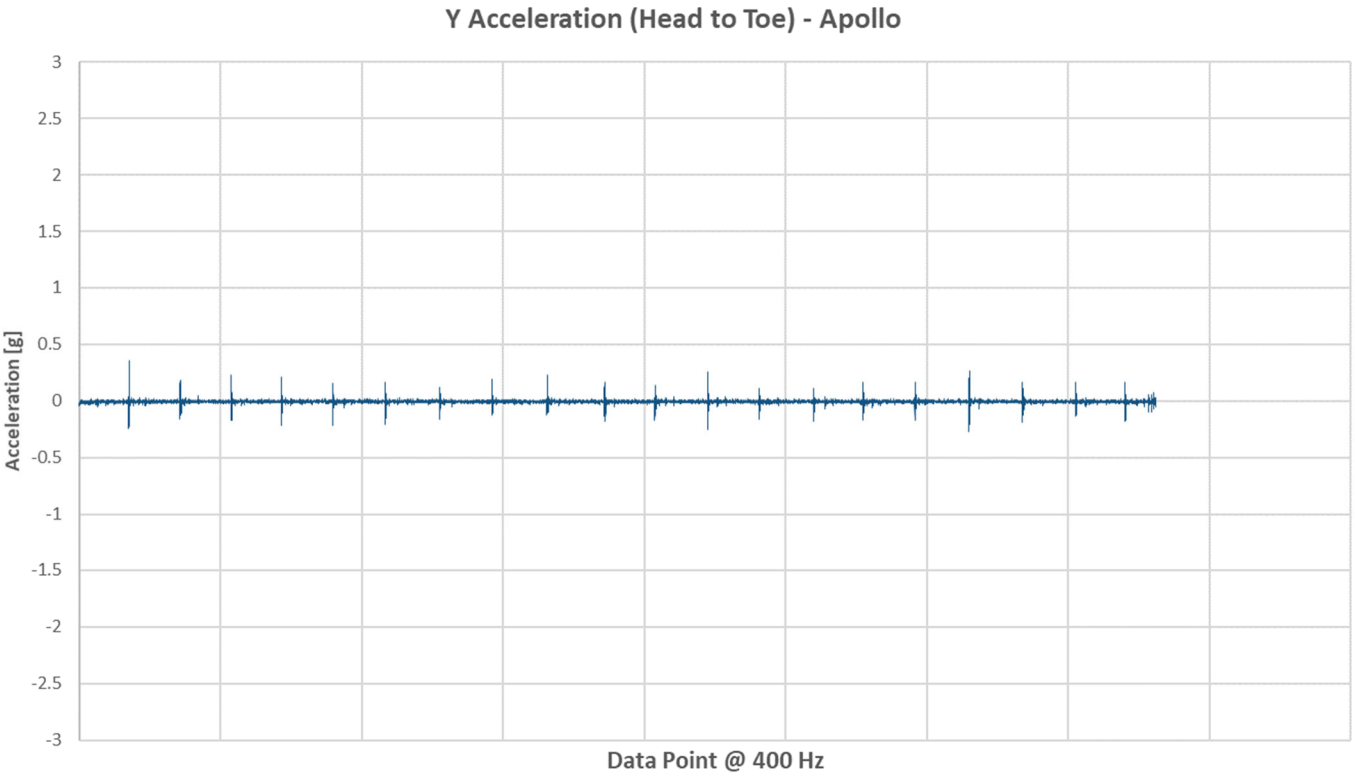

Y Acceleration (Head to Toe) - Penny
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

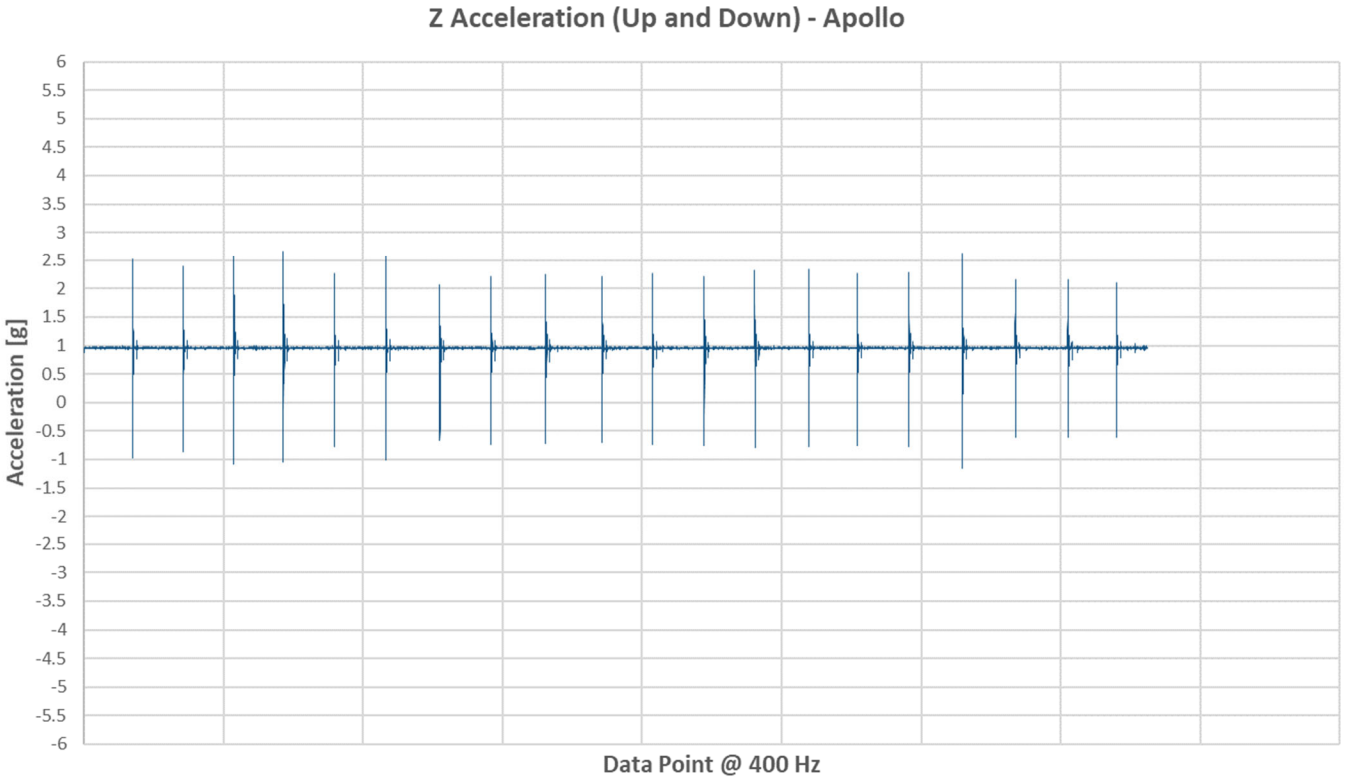

Z Acceleration (Up and Down) - Penny
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 –APOLLO

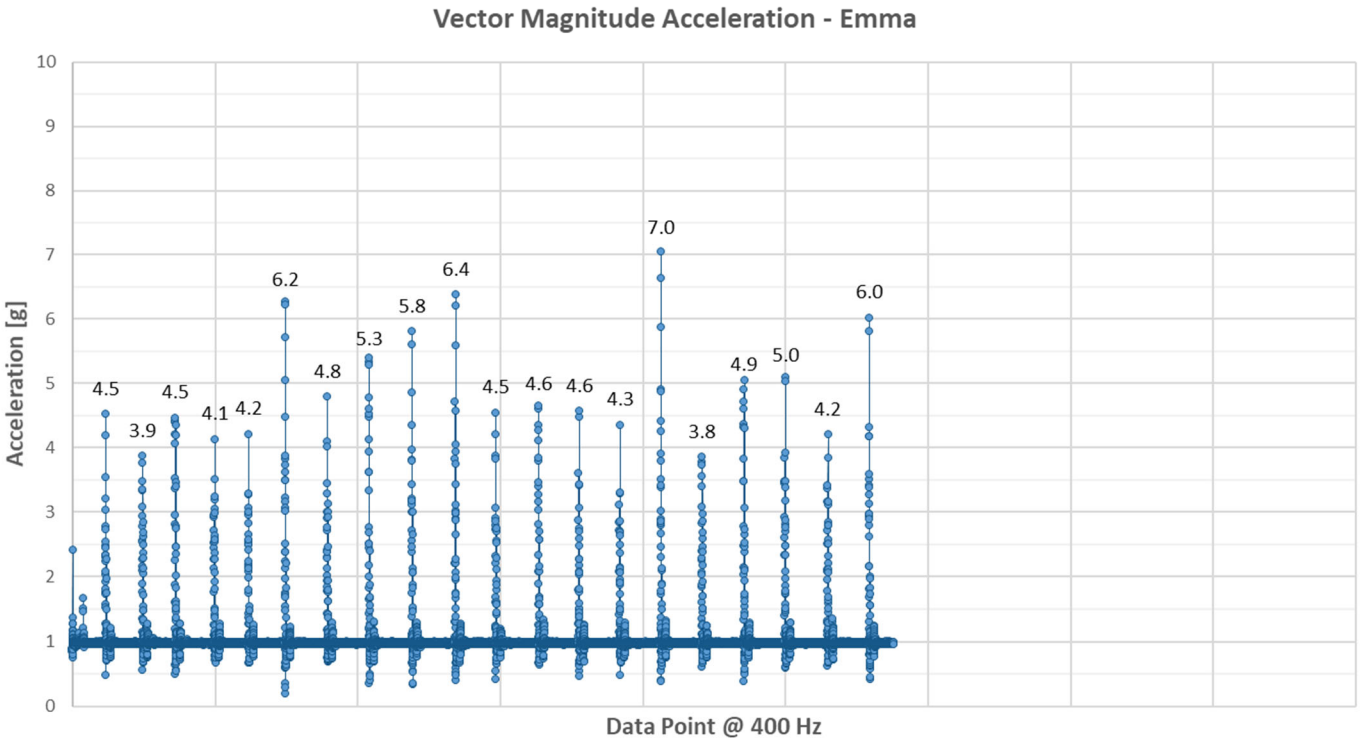


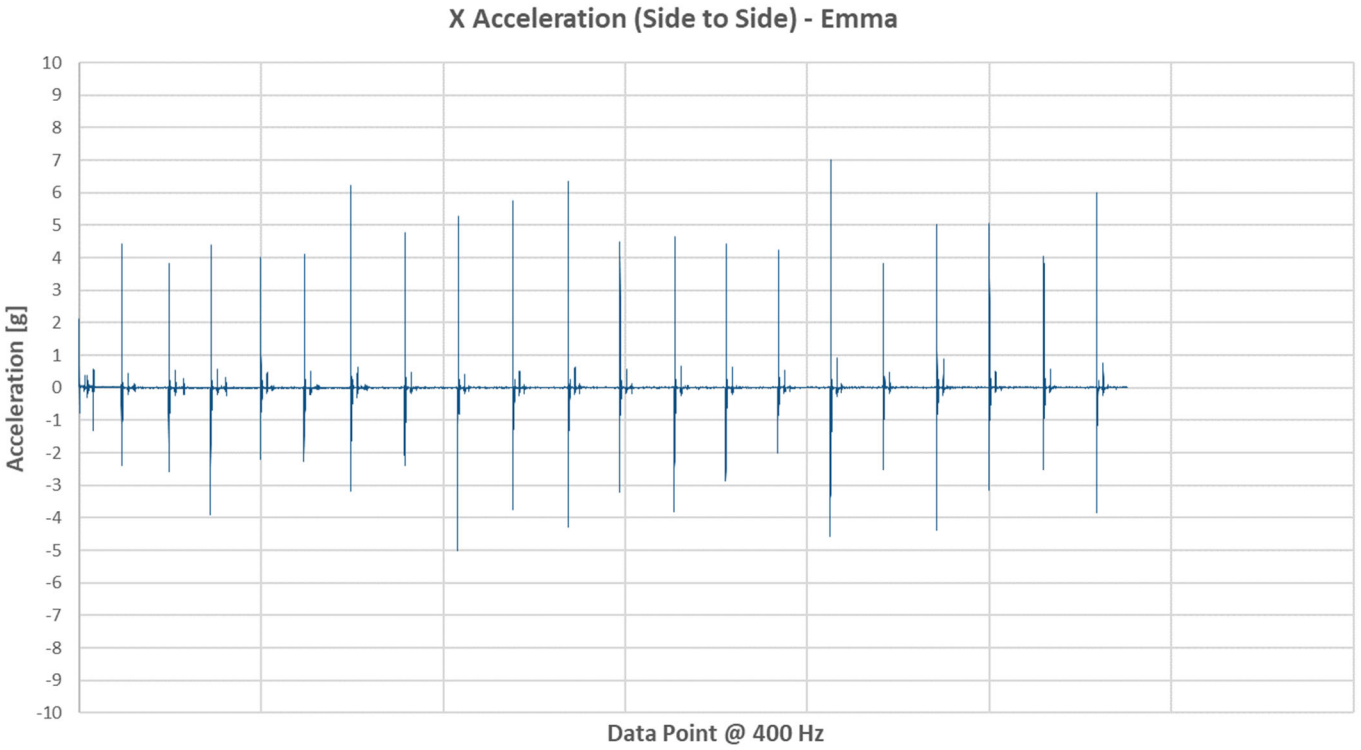


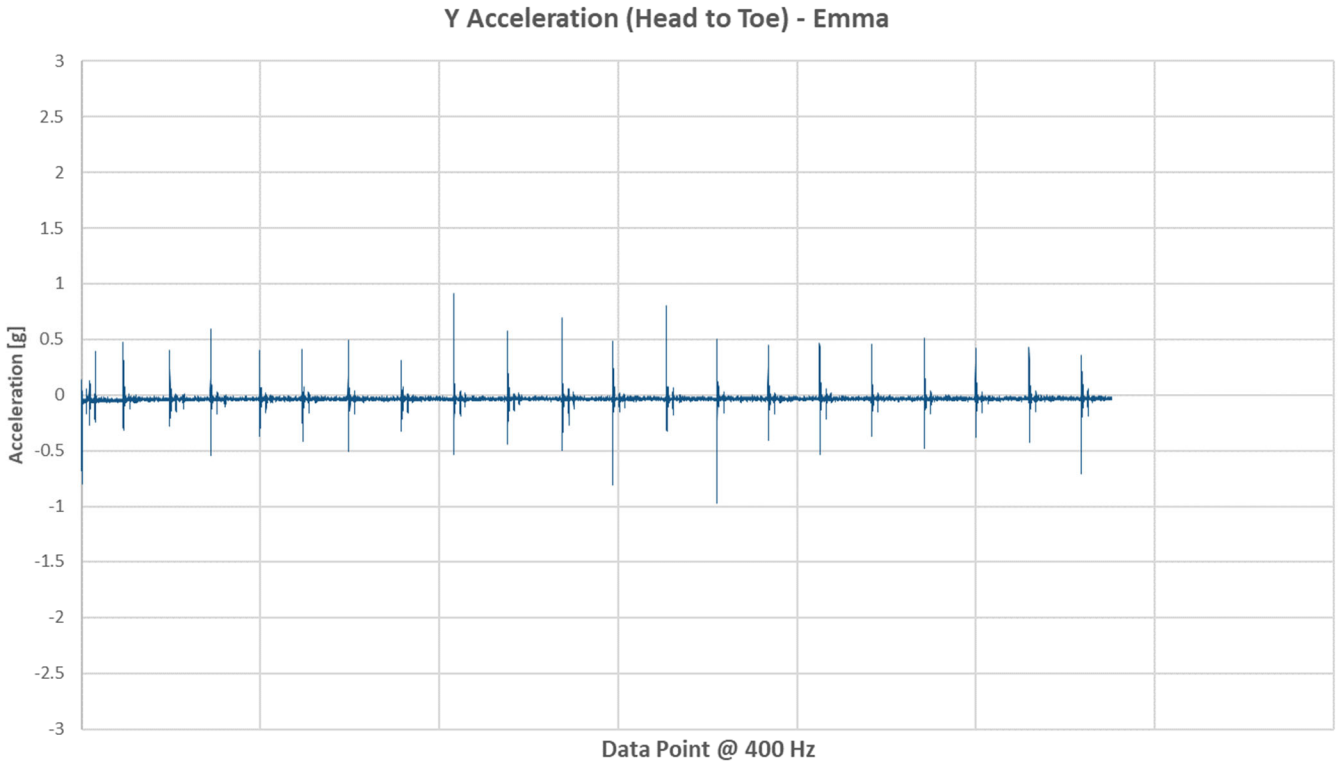

Y Acceleration (Head to Toe) - Apollo
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

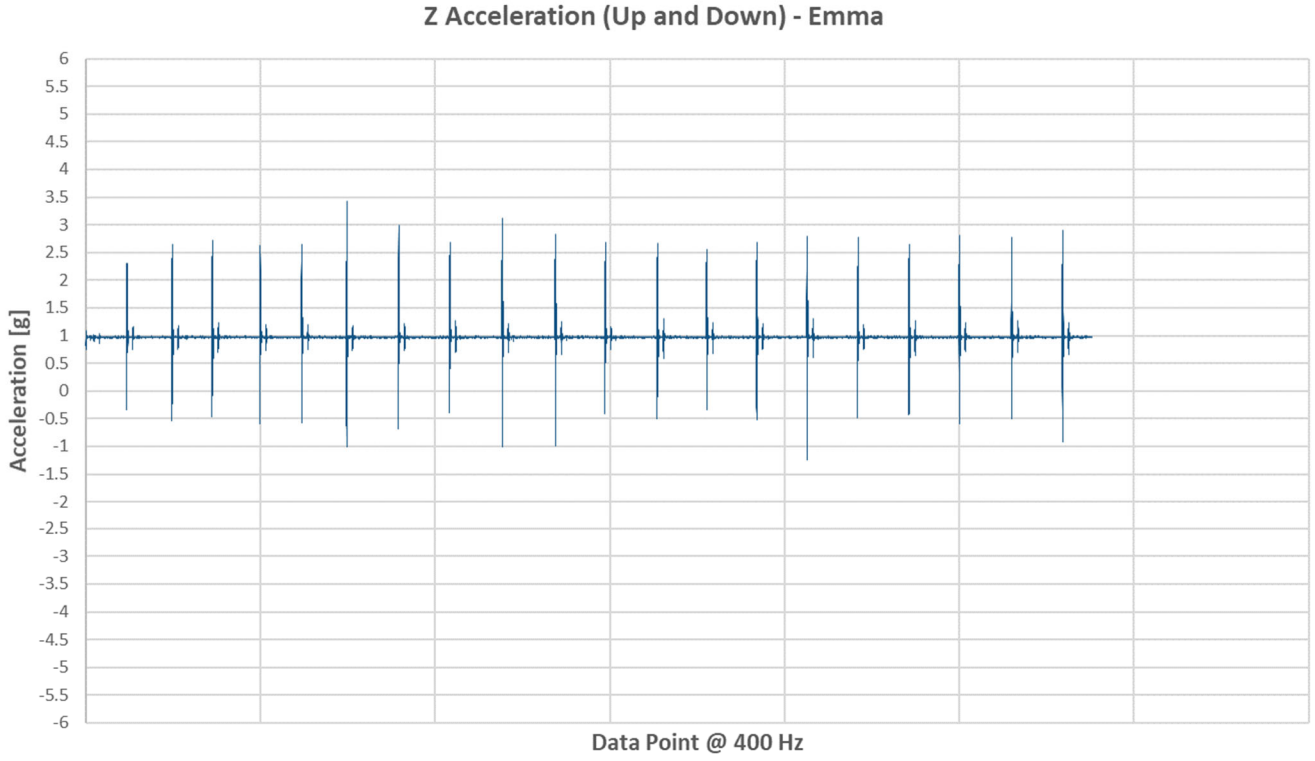

Z Acceleration (Up and Down) - Apollo
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 –EMMA

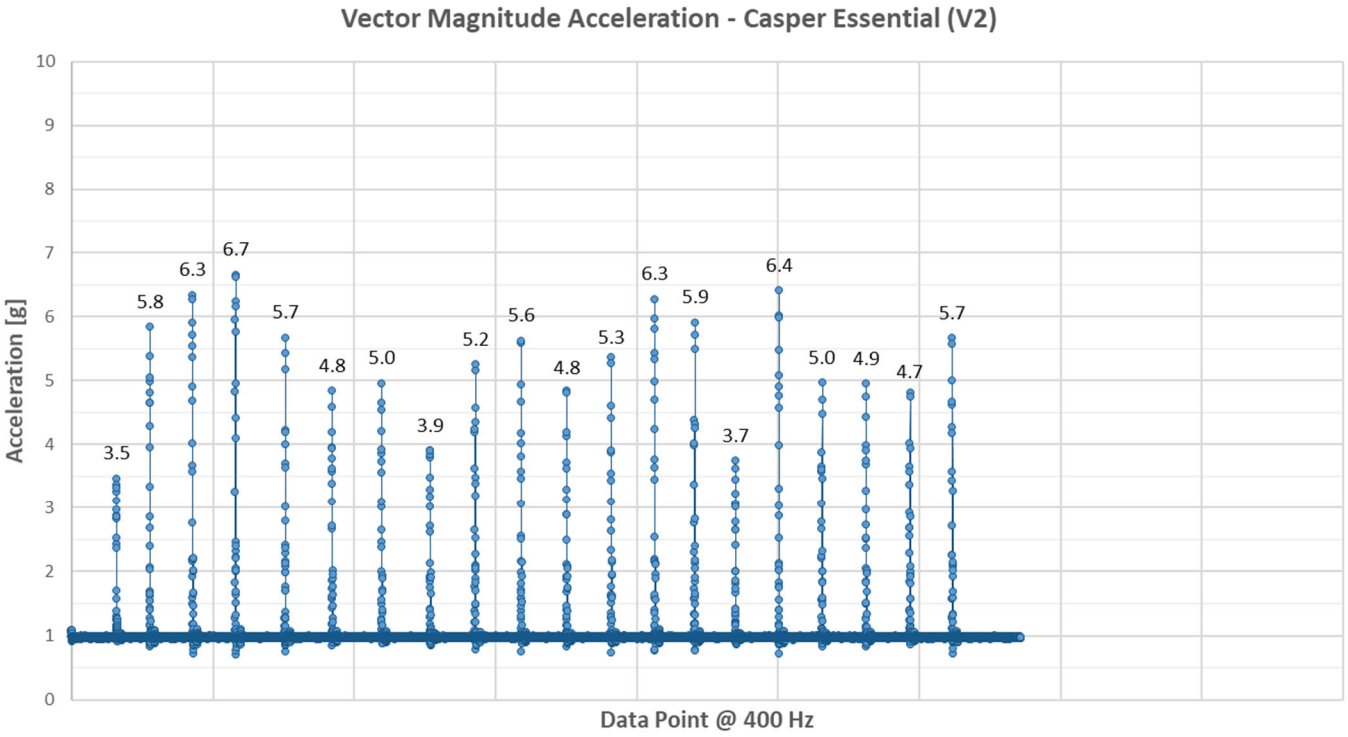

Vector Magnitude Acceleration - Emma
Acceleration [g]
Data Point @ 400 Hz
4.5
3.9
4.5
4.1
4.2
6.2
4.8
5.3
5.8
6.4
4.5
4.6
4.6
4.3
7.0
3.8
4.9
5.0
4.2
6.0

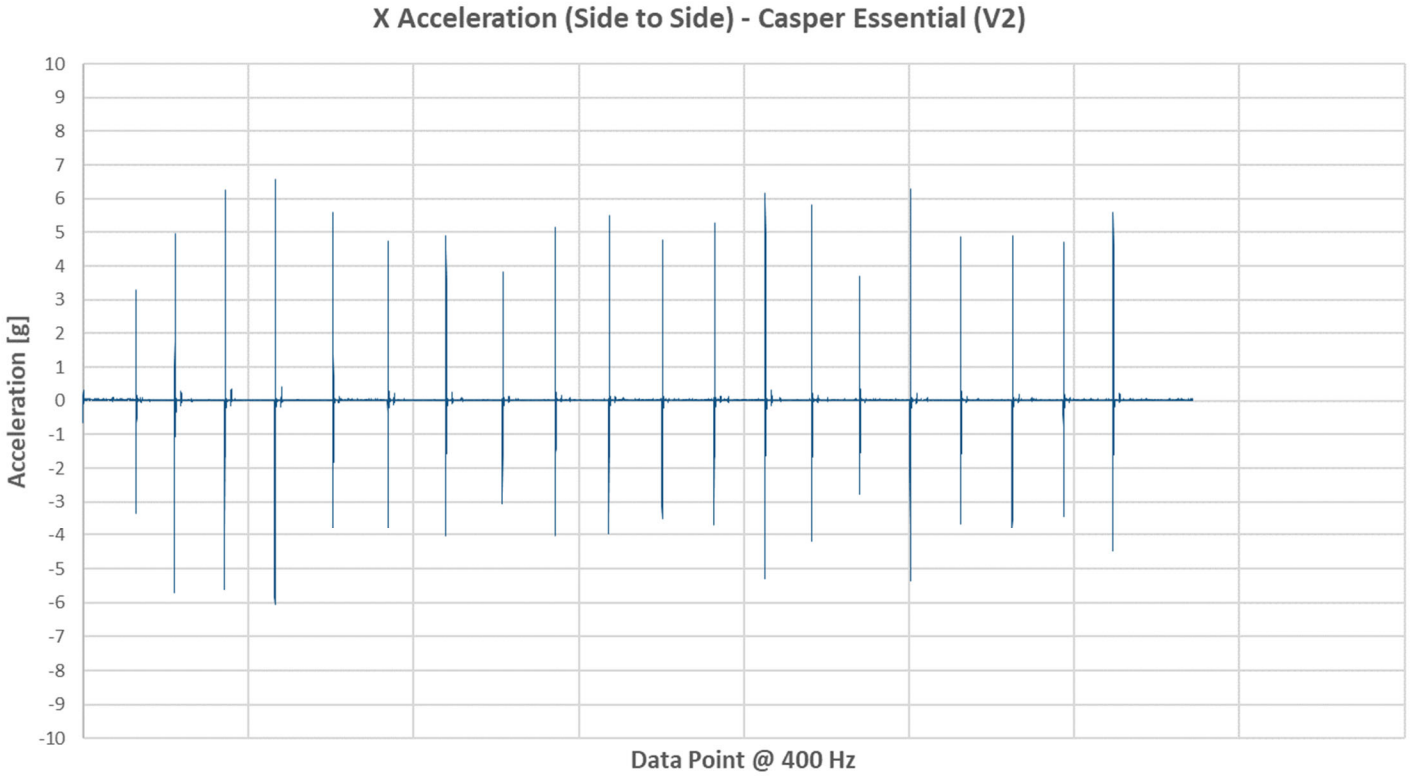

X Acceleration (Side to Side) - Emma
Acceleration [g]
Data Point @ 400 Hz

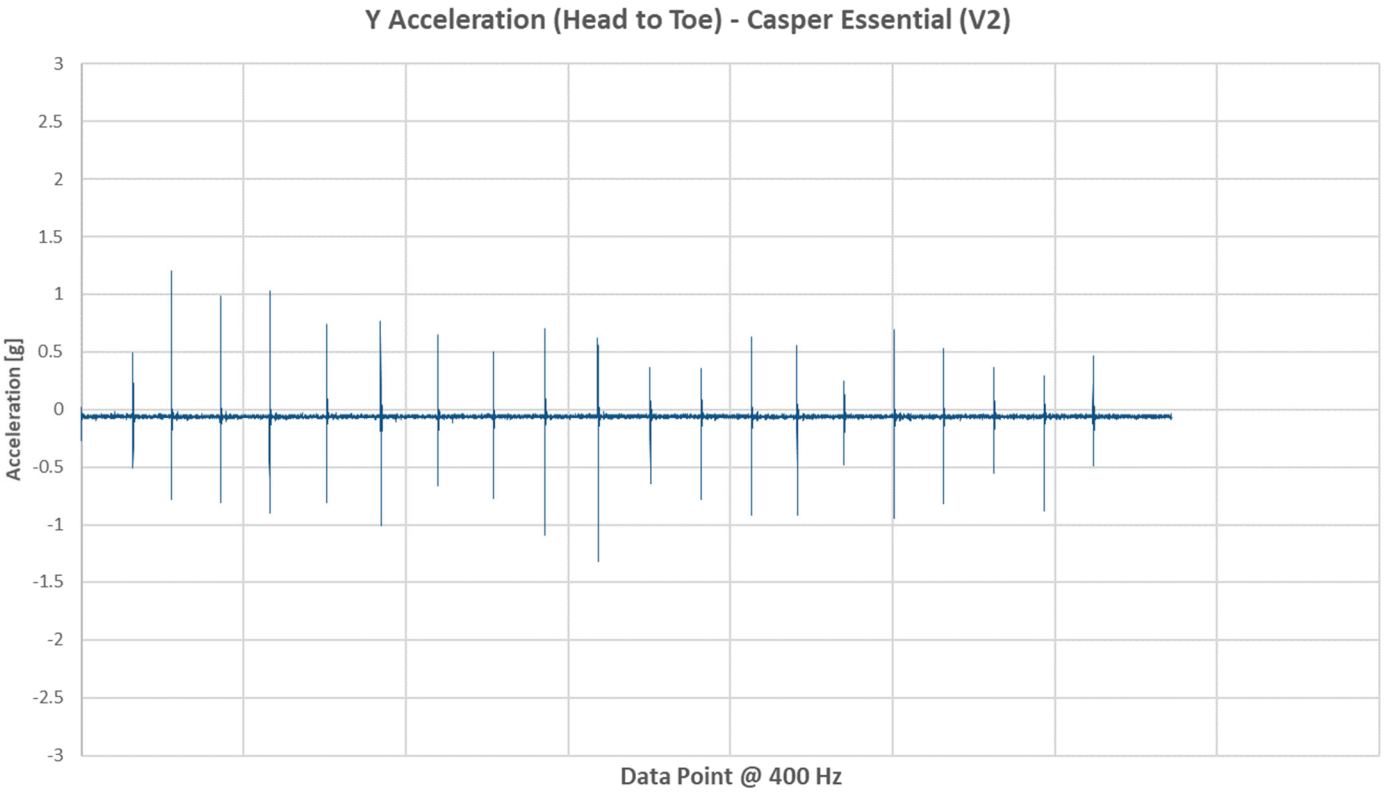

Y Acceleration (Head to Toe) - Emma
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

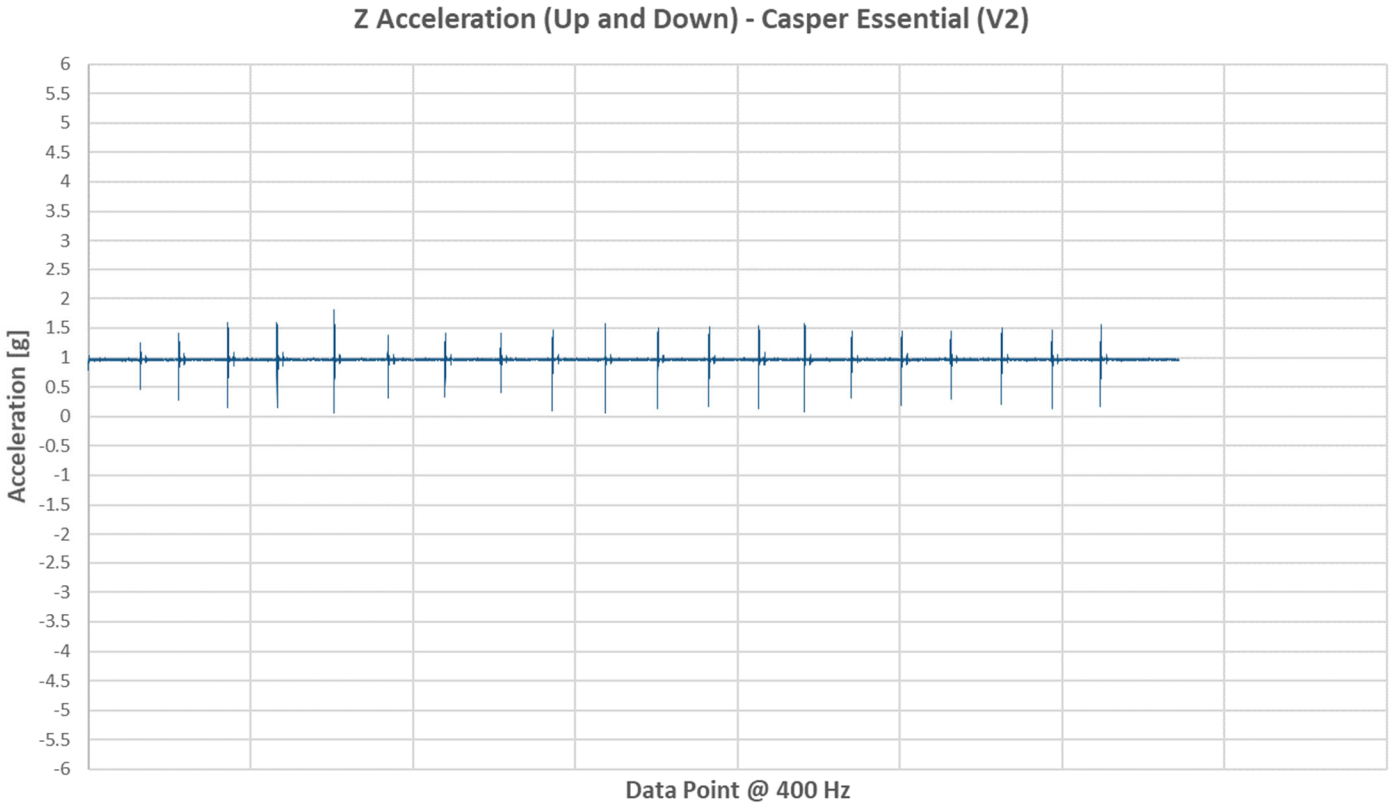

Z Acceleration (Up and Down) - Emma
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 –CASPER ESSENTIAL (V2)

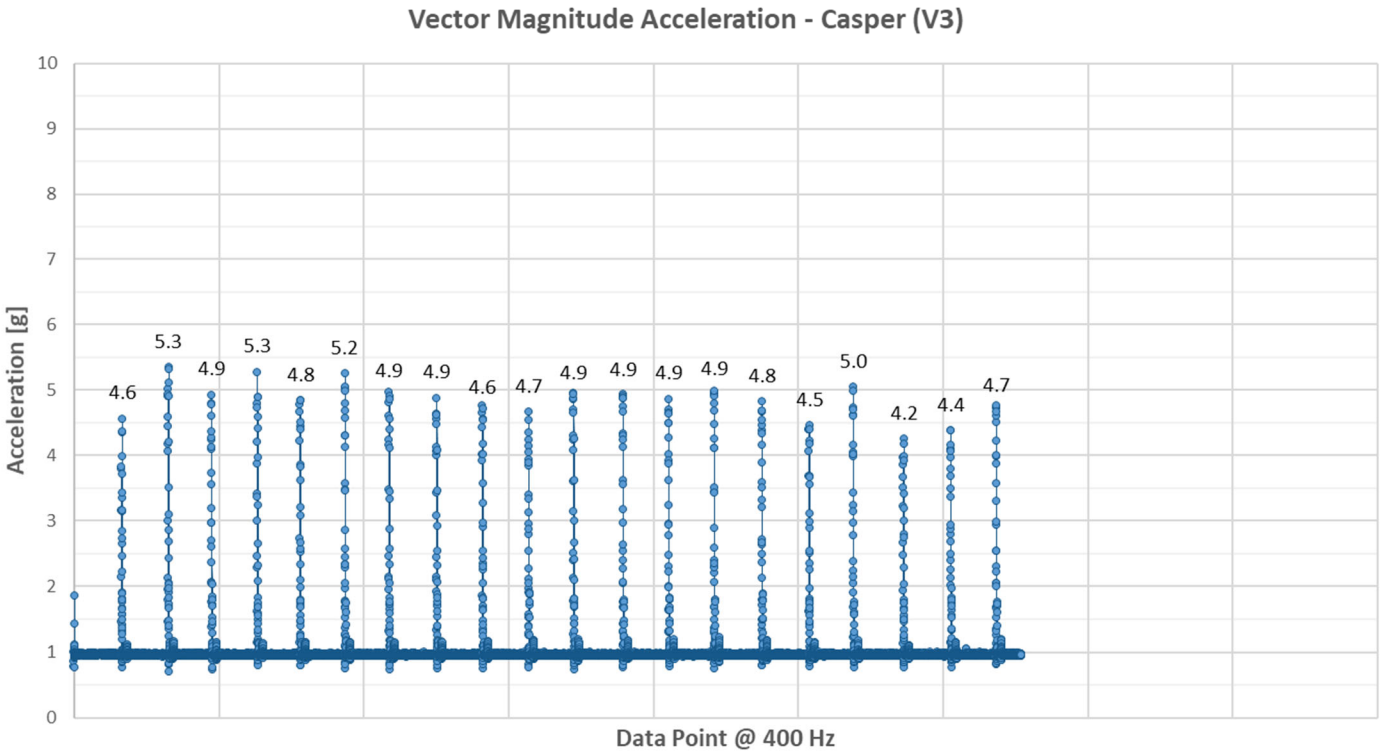


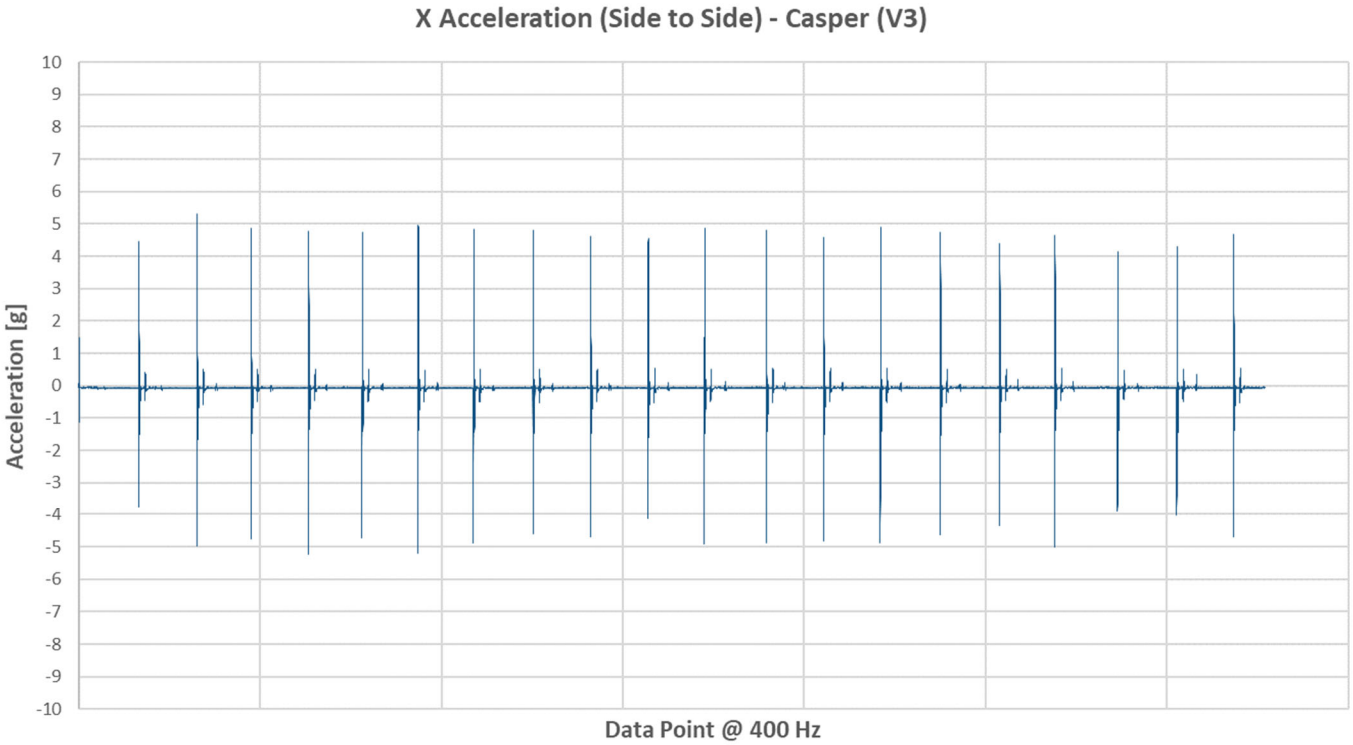


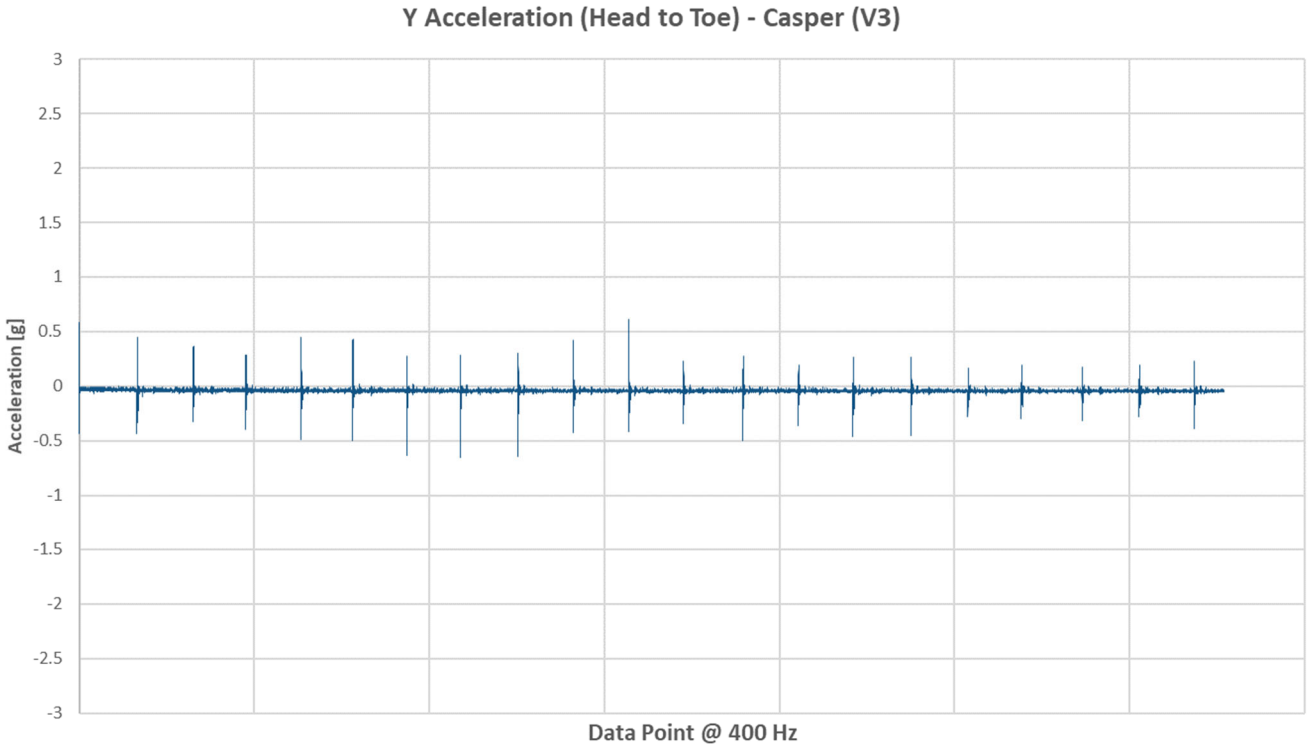

Y Acceleration (Head to Toe) - Casper Essential (V2)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

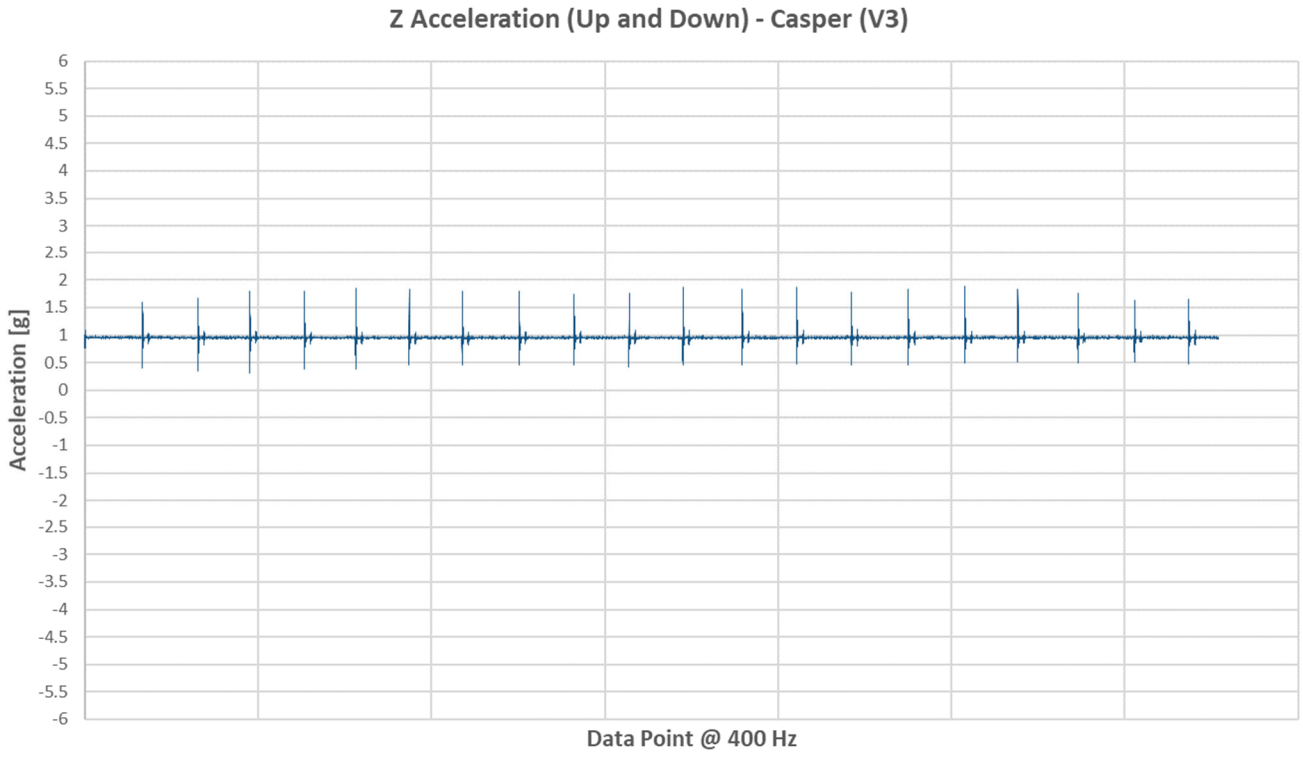

Z Acceleration (Up and Down) - Casper Essential (V2)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 –CASPER (V3)

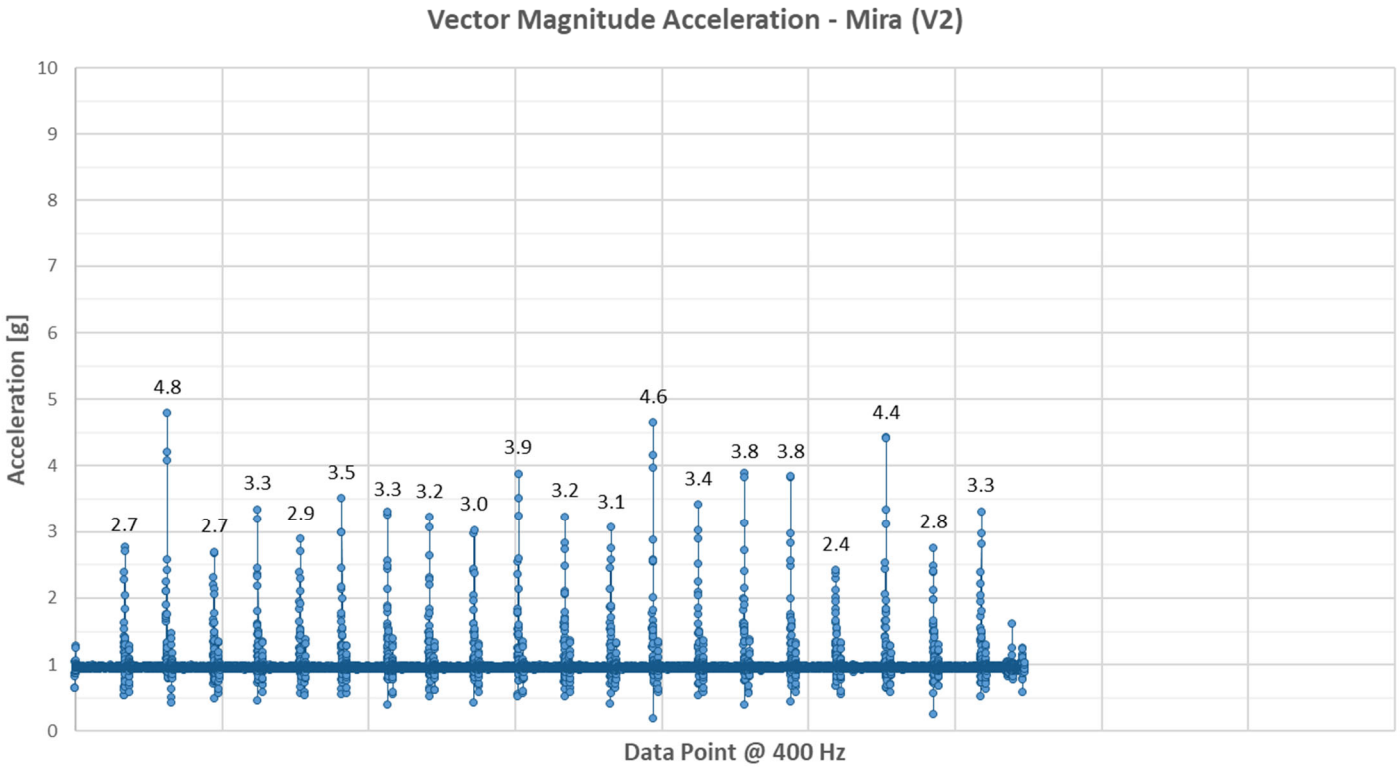


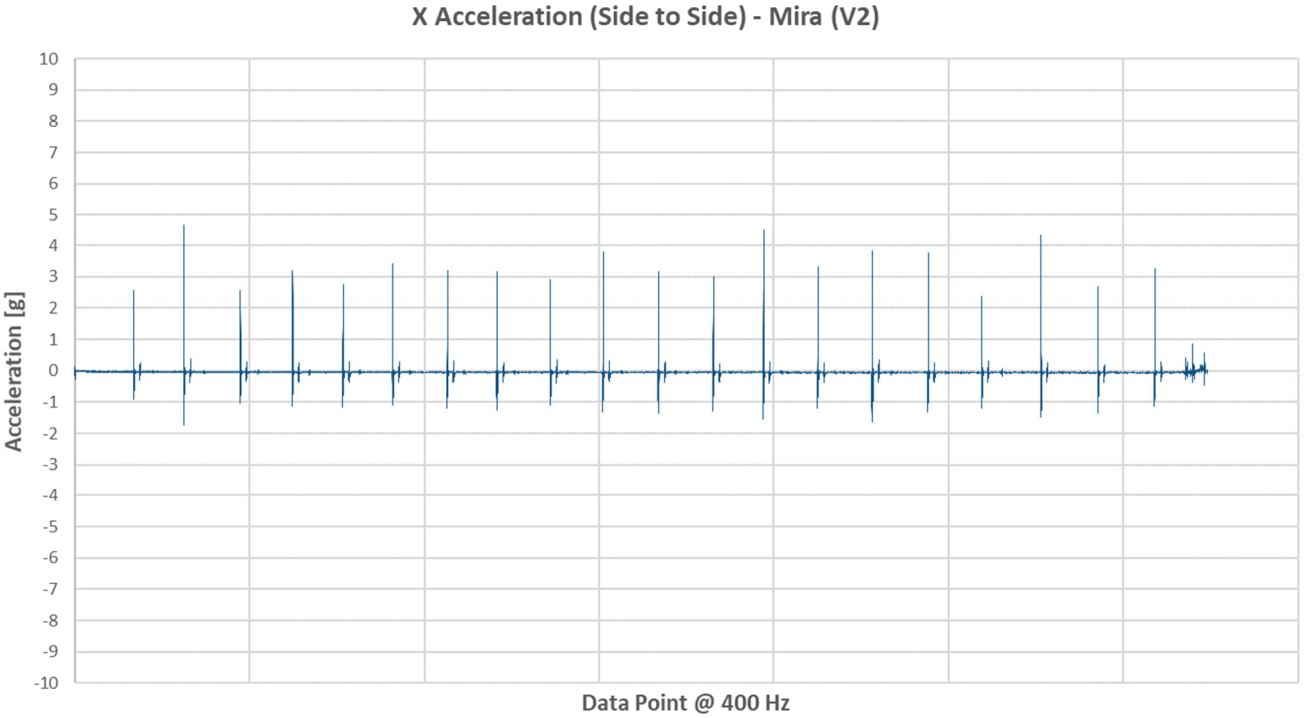


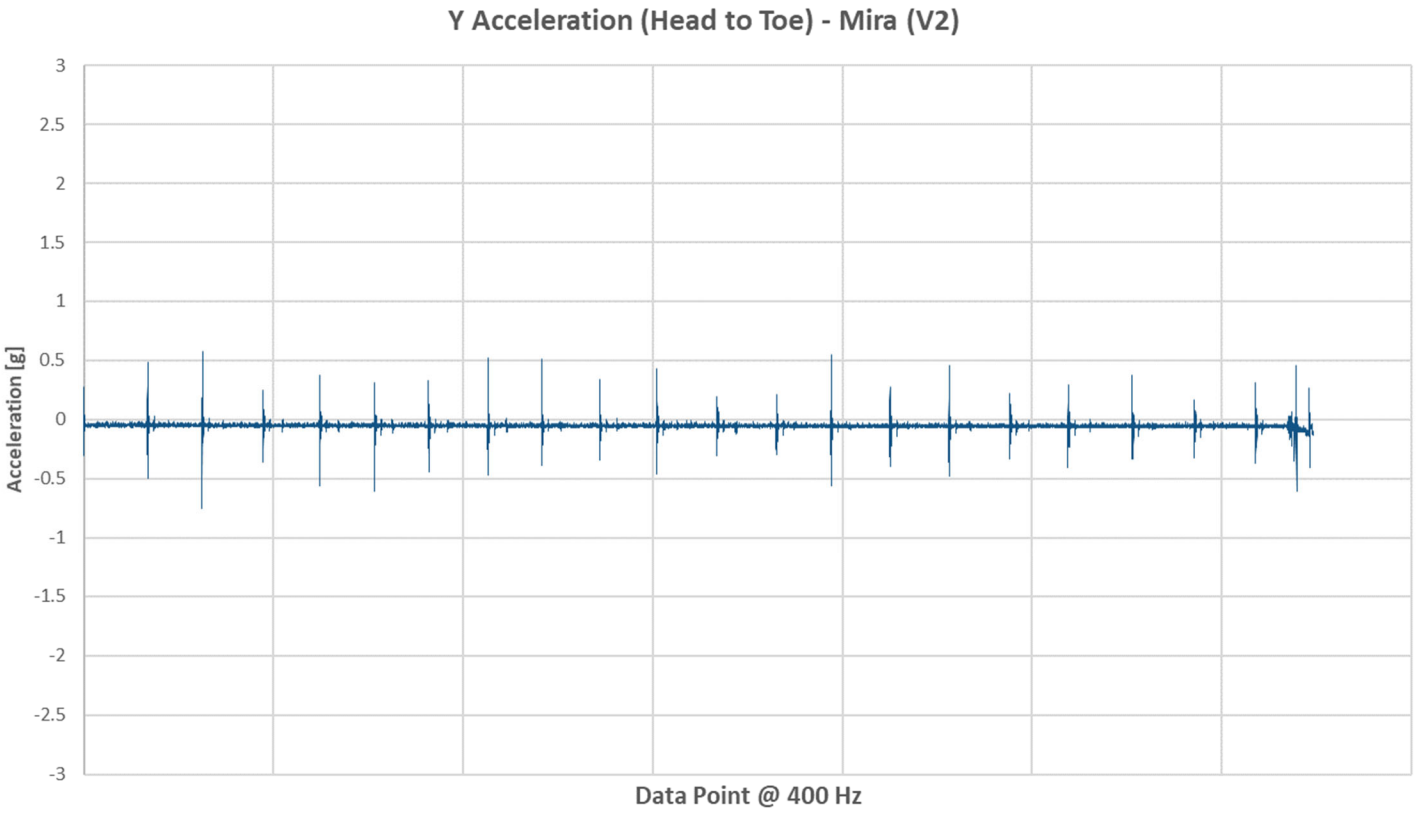

Y Acceleration (Head to Toe) - Casper (V3)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

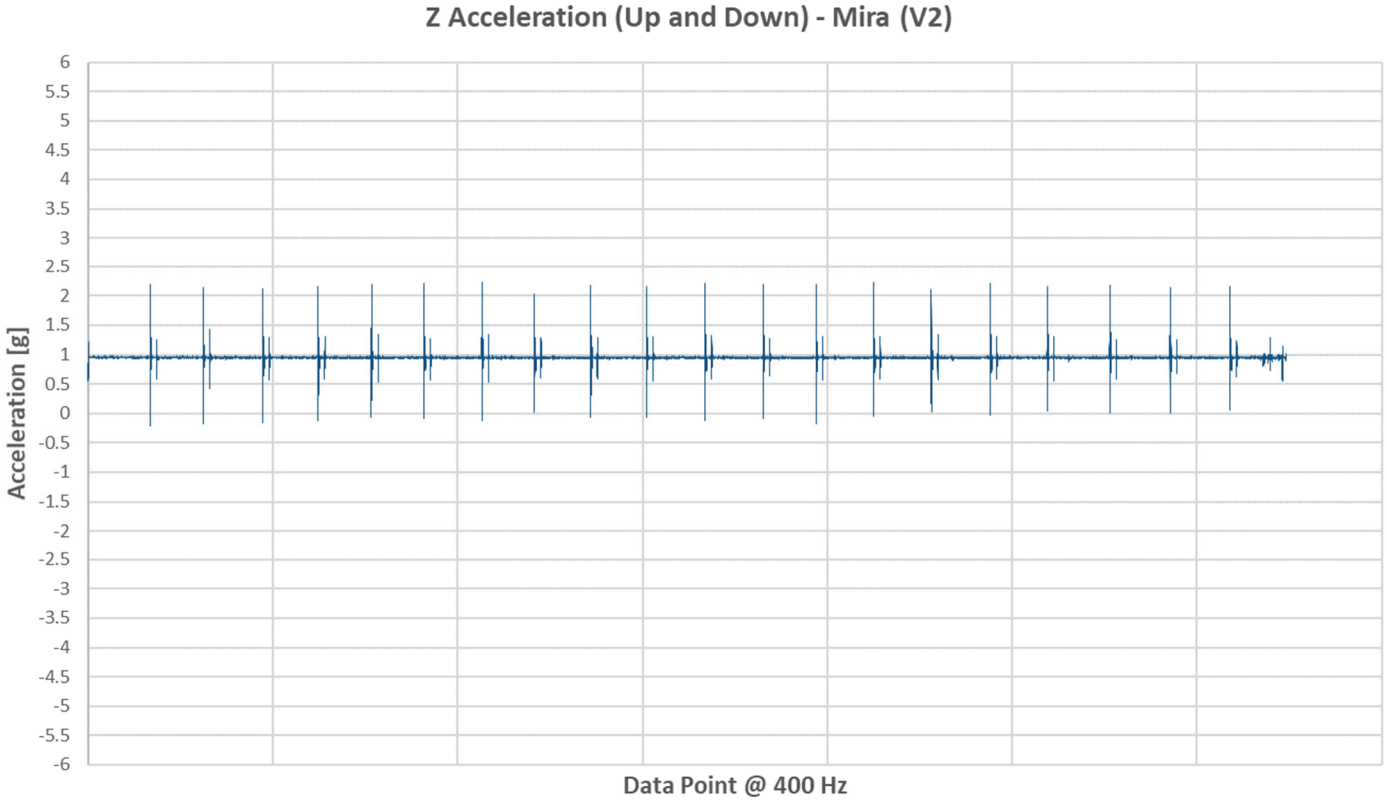

Z Acceleration (Up and Down) - Casper (V3)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – MIRA (V2)

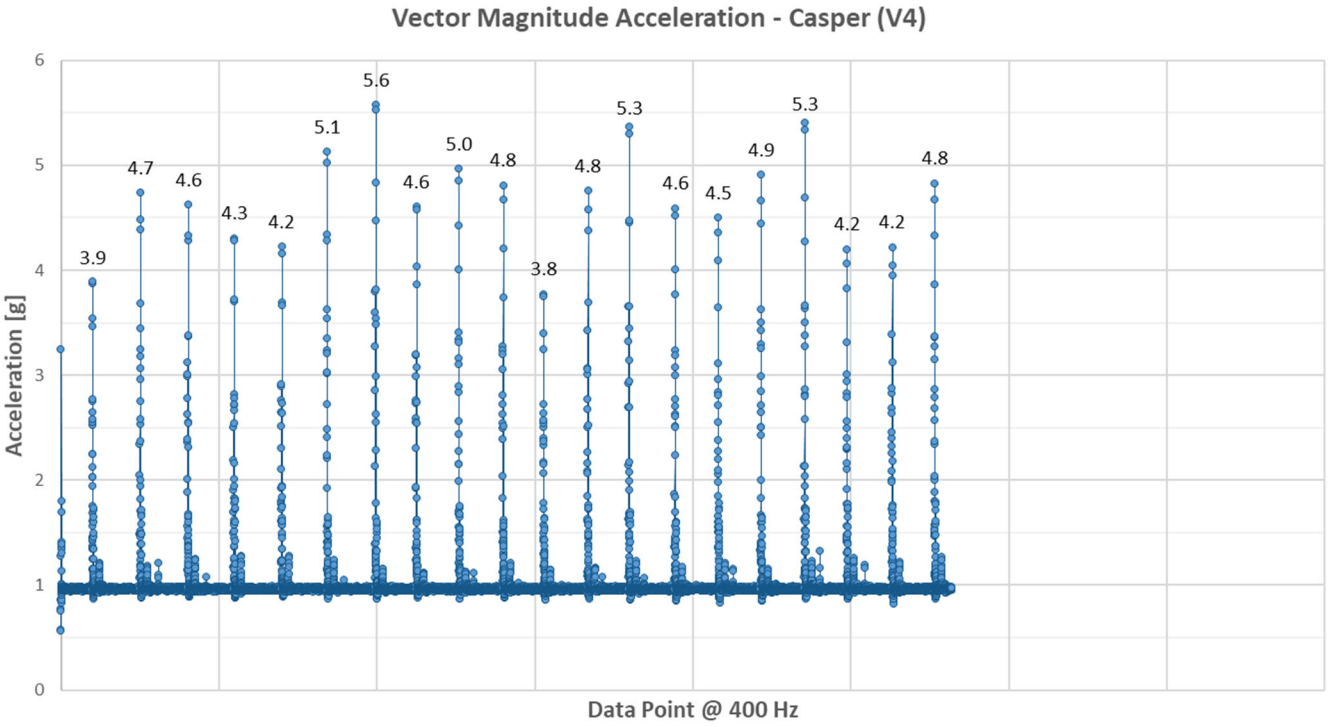


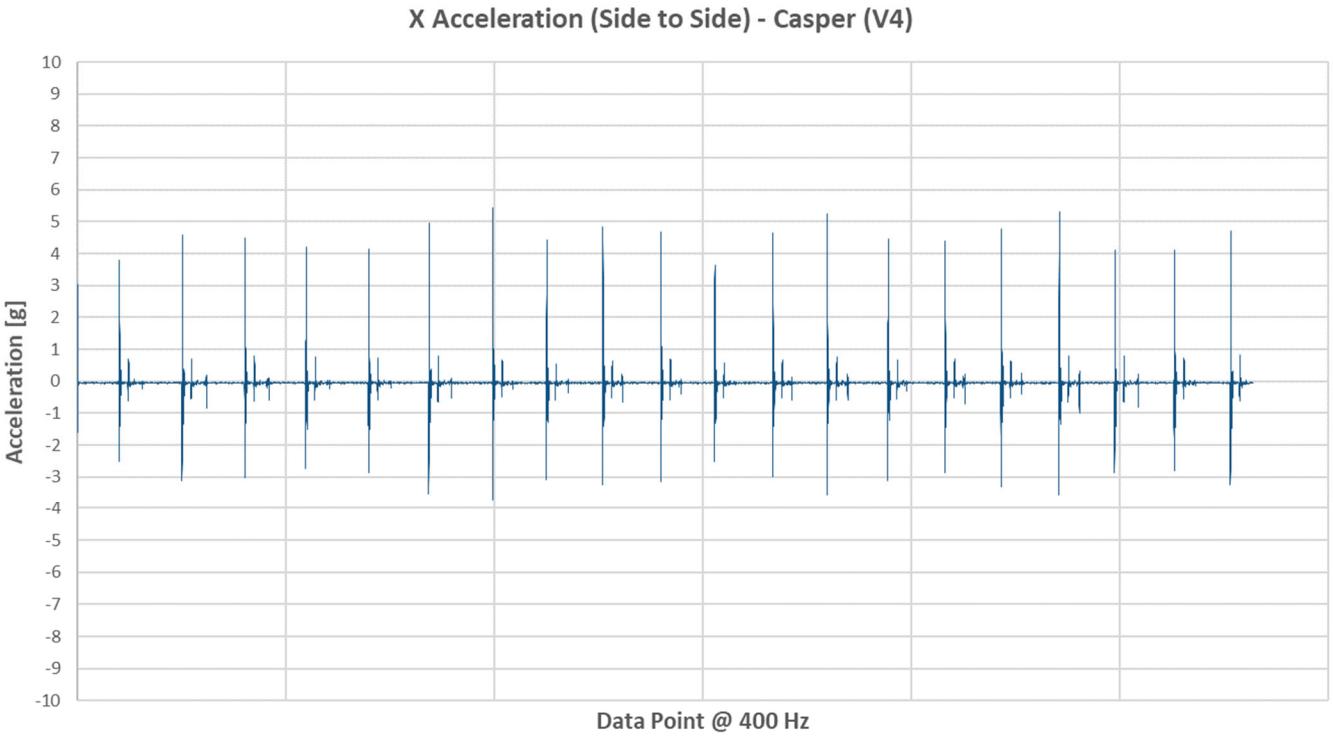


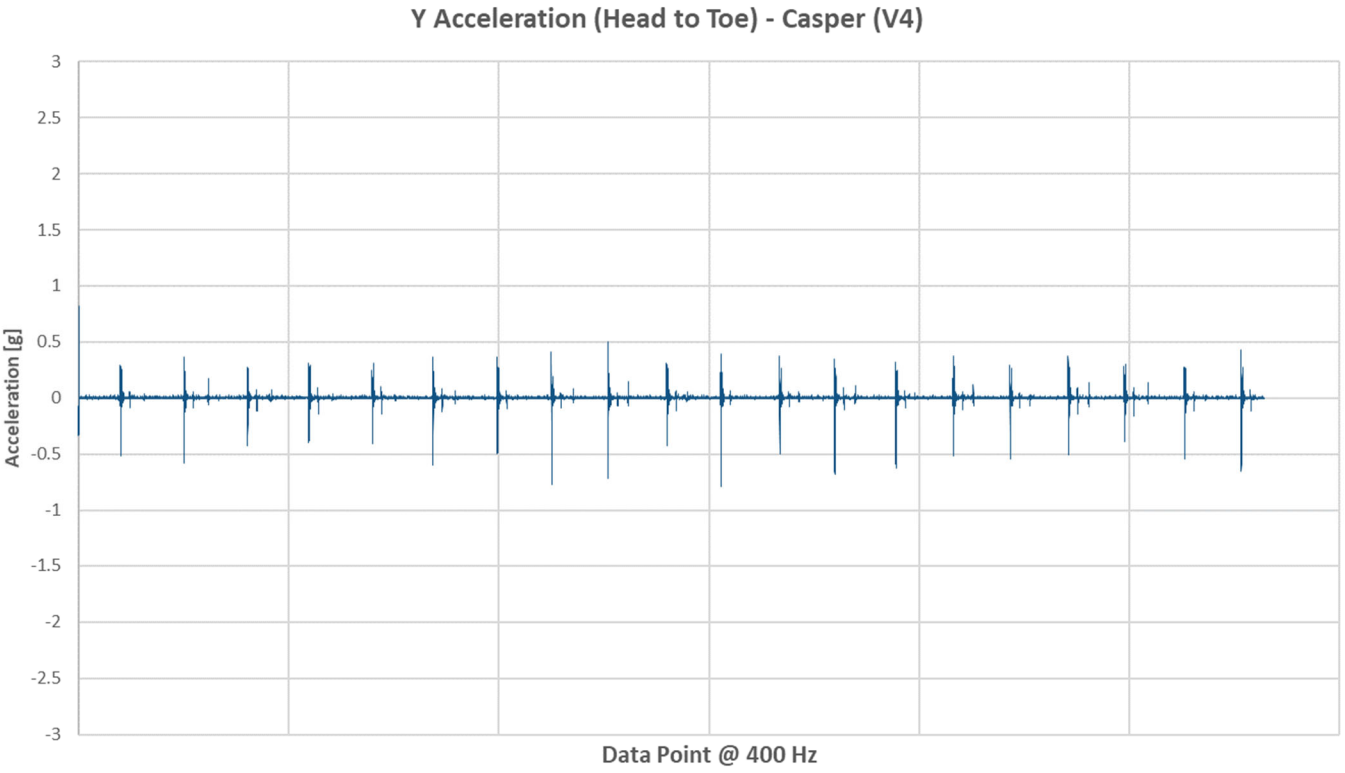

Y Acceleration (Head to Toe) - Mira (V2)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

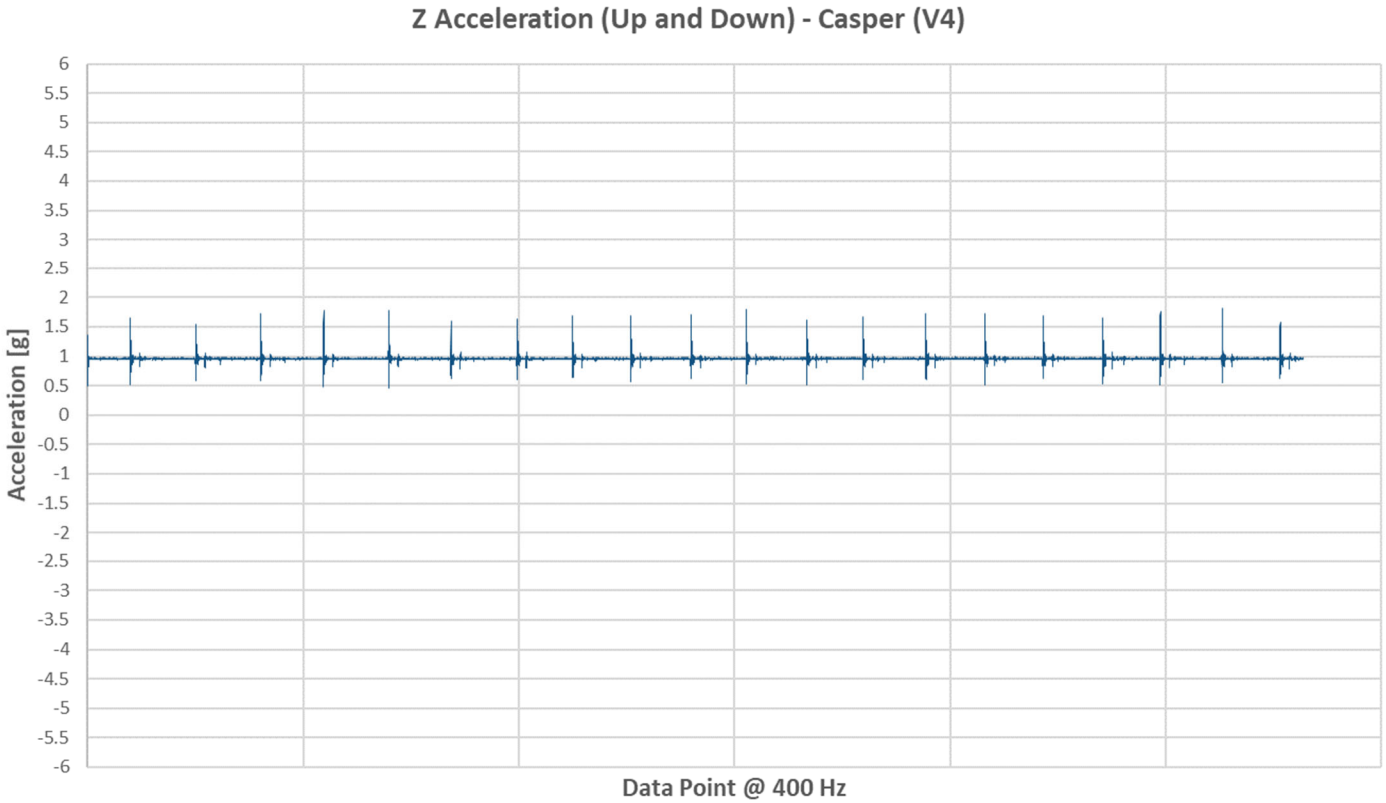

Z Acceleration (Up and Down) - Mira (V2)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – CASPER (V4)

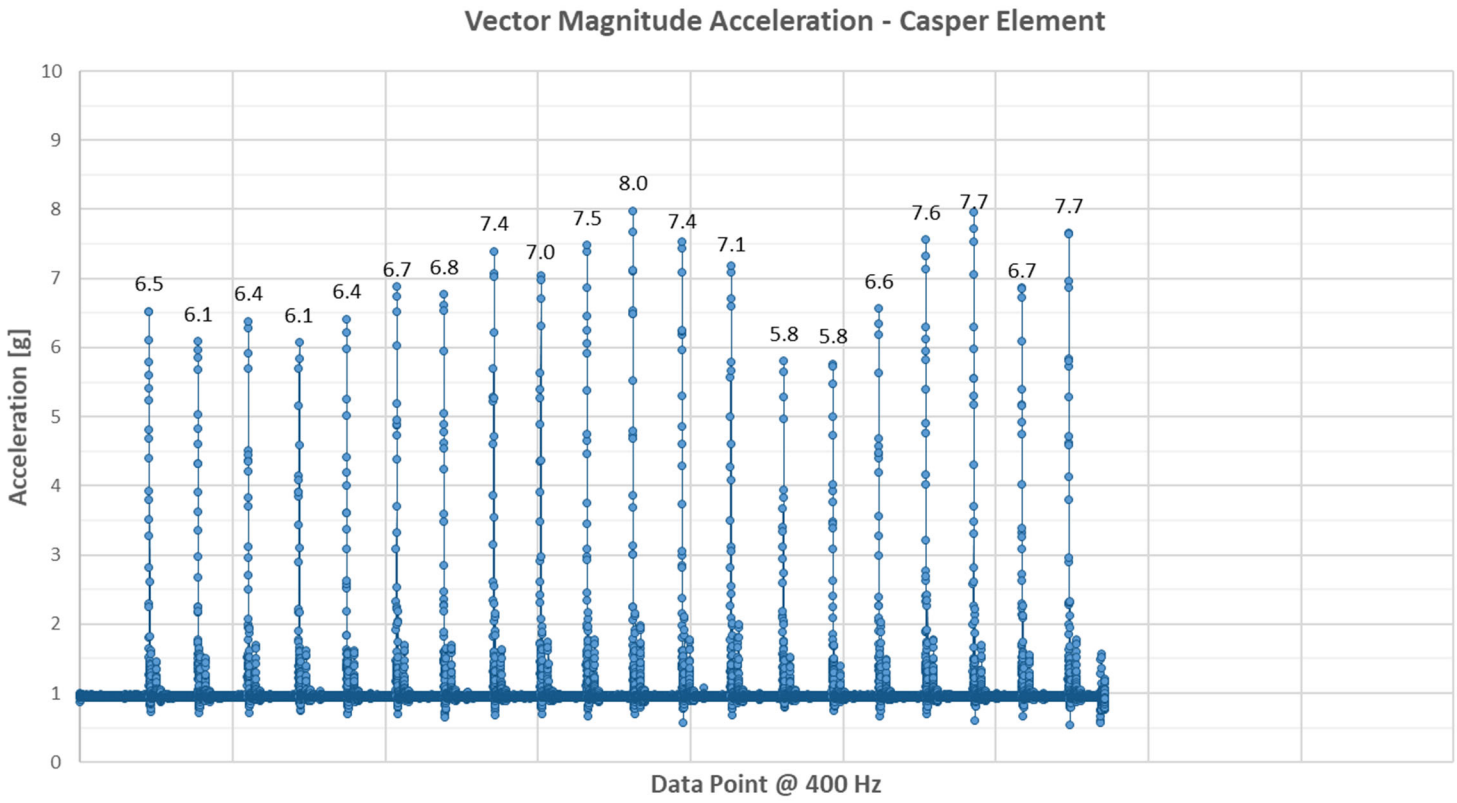


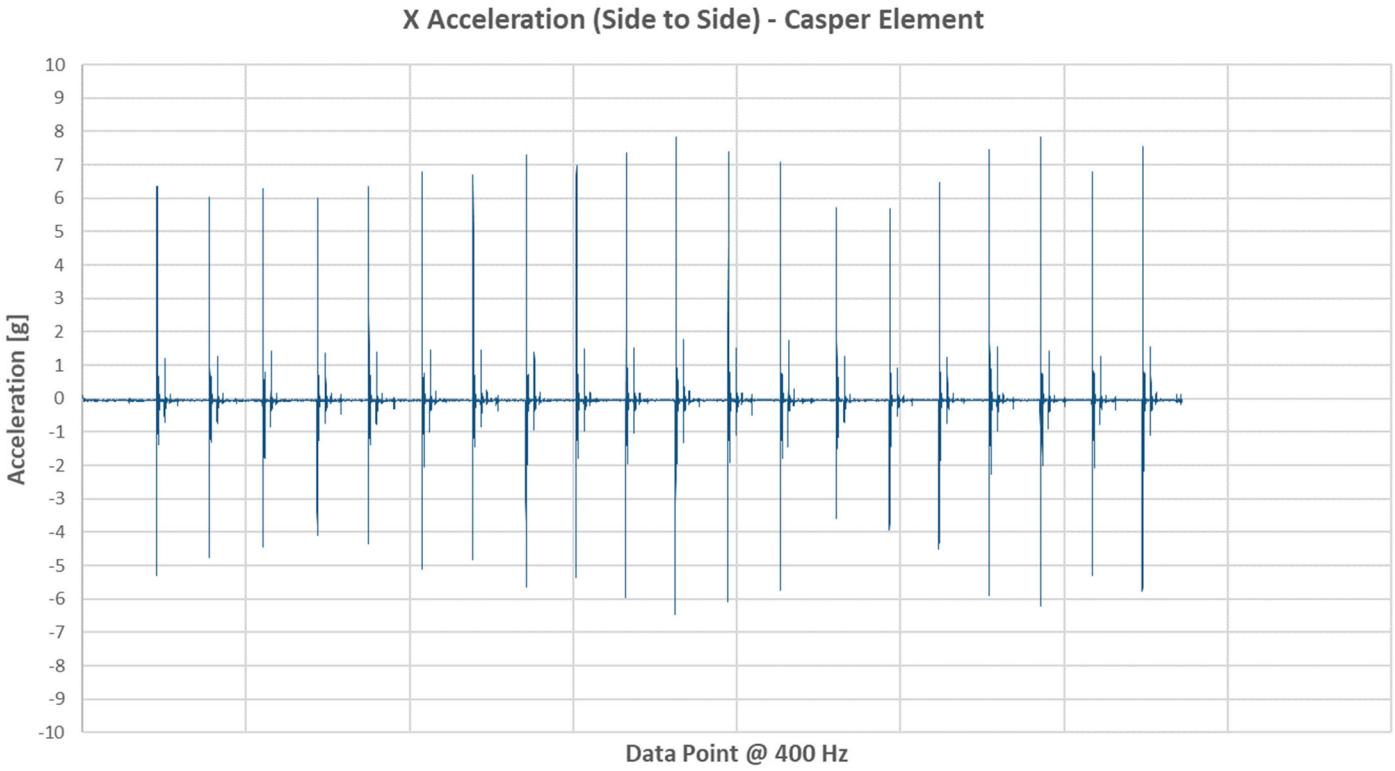


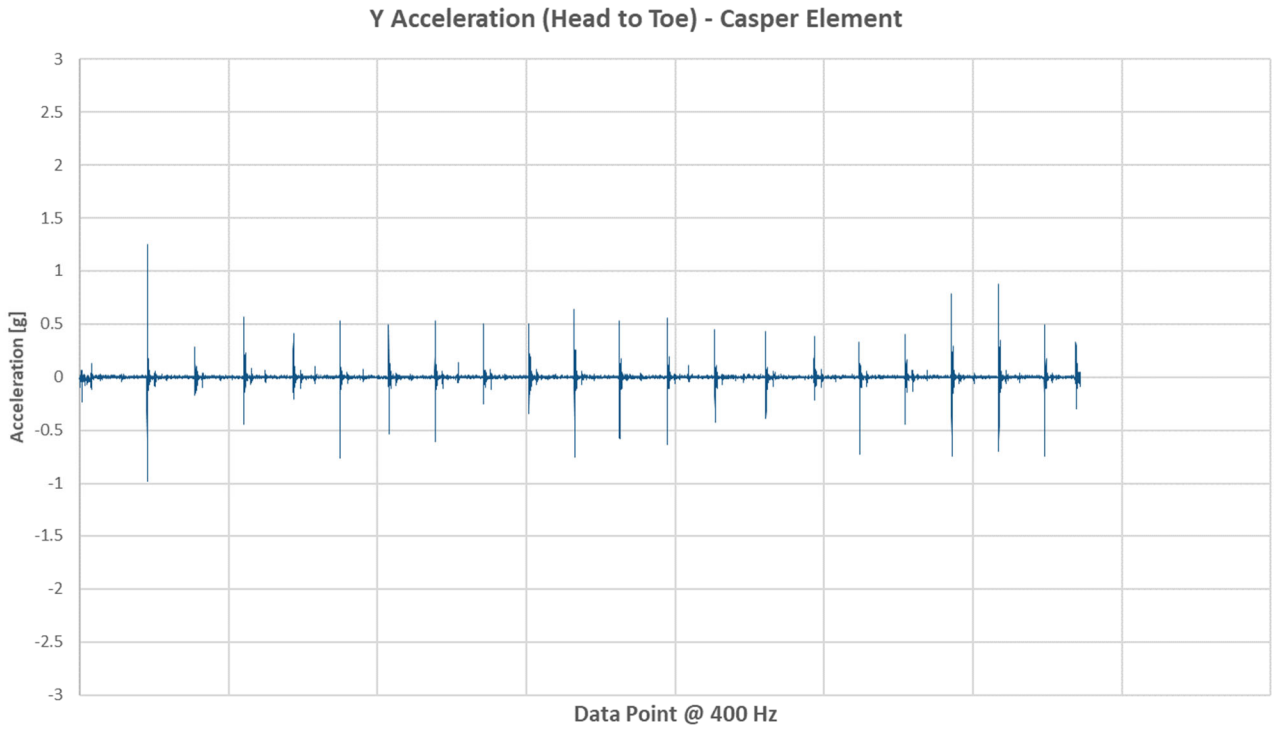

Y Acceleration (Head to Toe) - Casper (V4)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

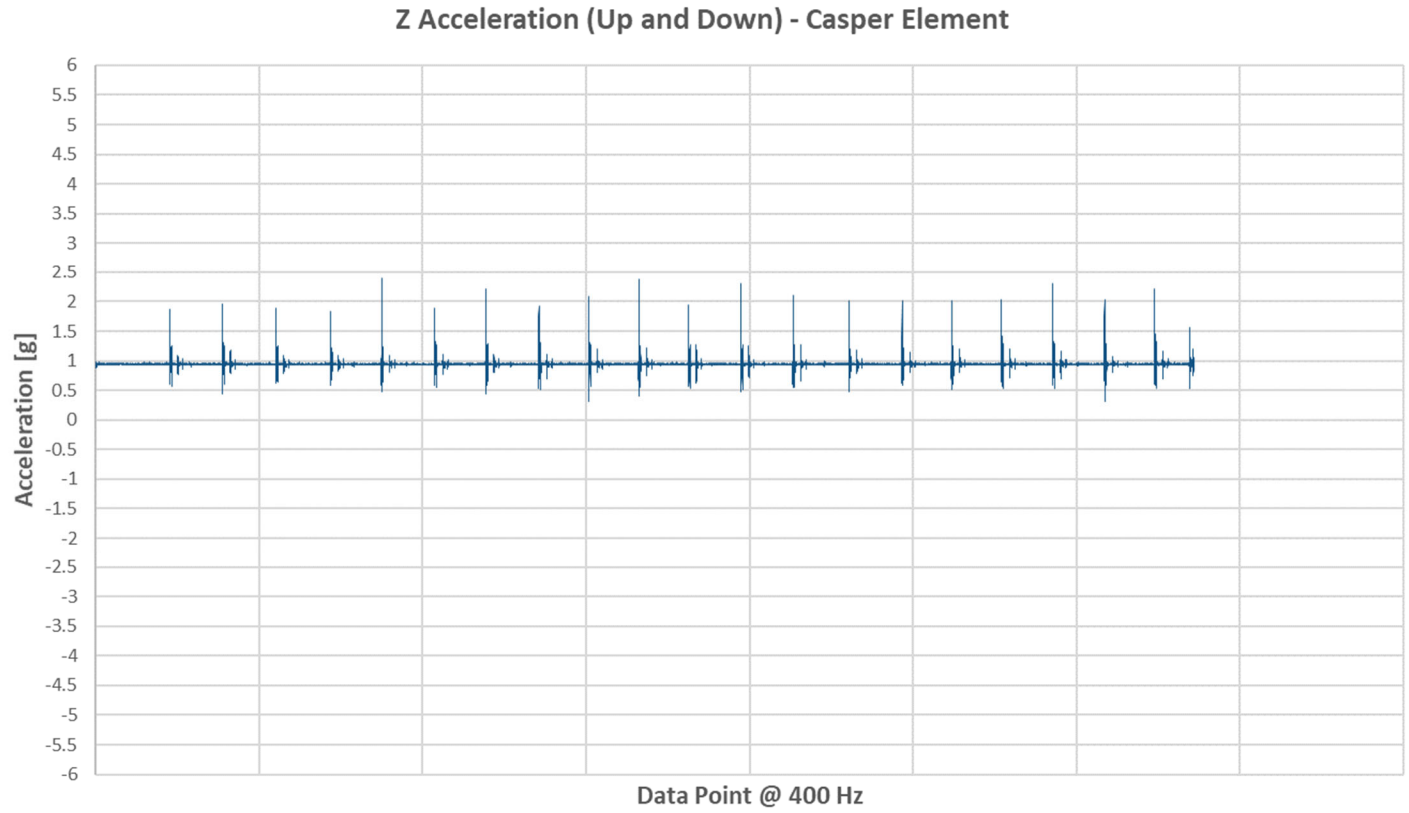

Z Acceleration (Up and Down) - Casper (V4)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – CASPER ELEMENT

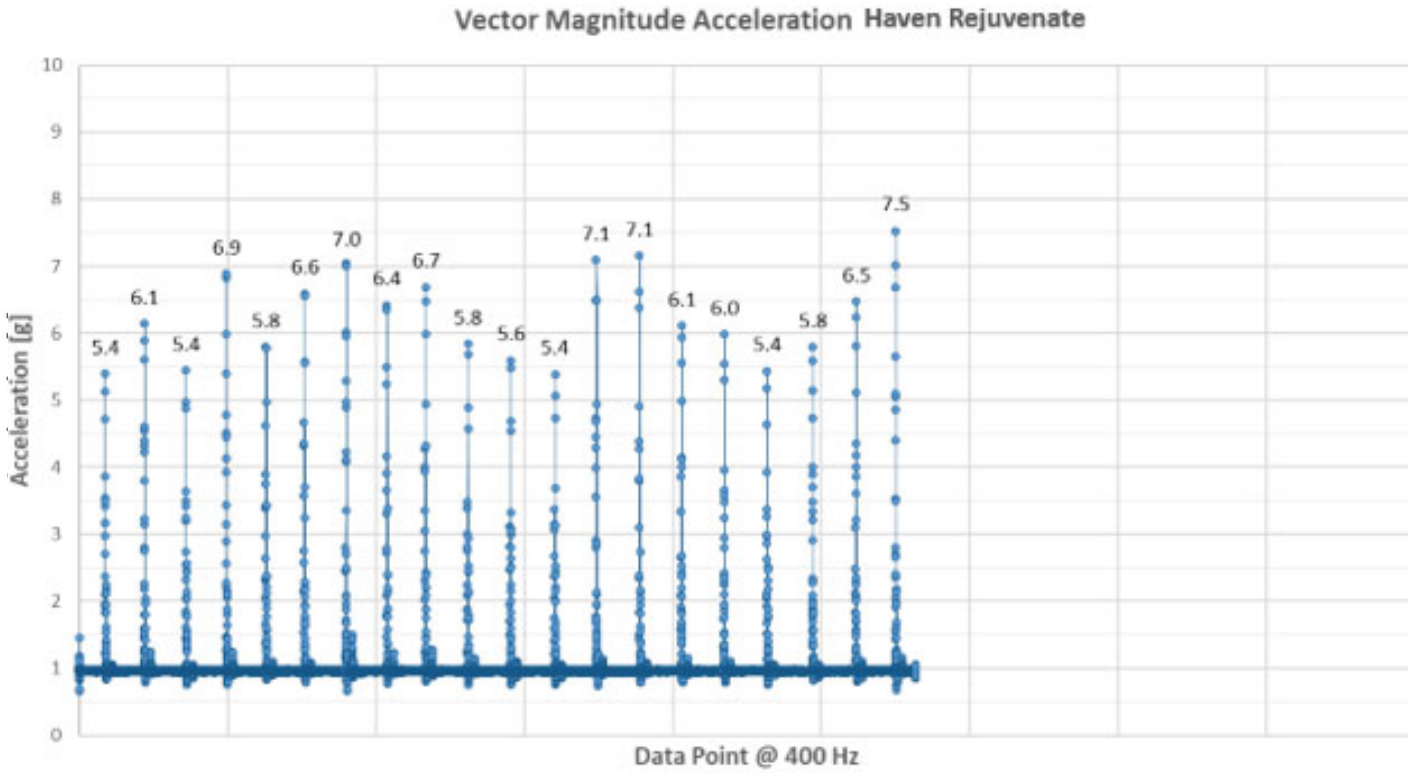


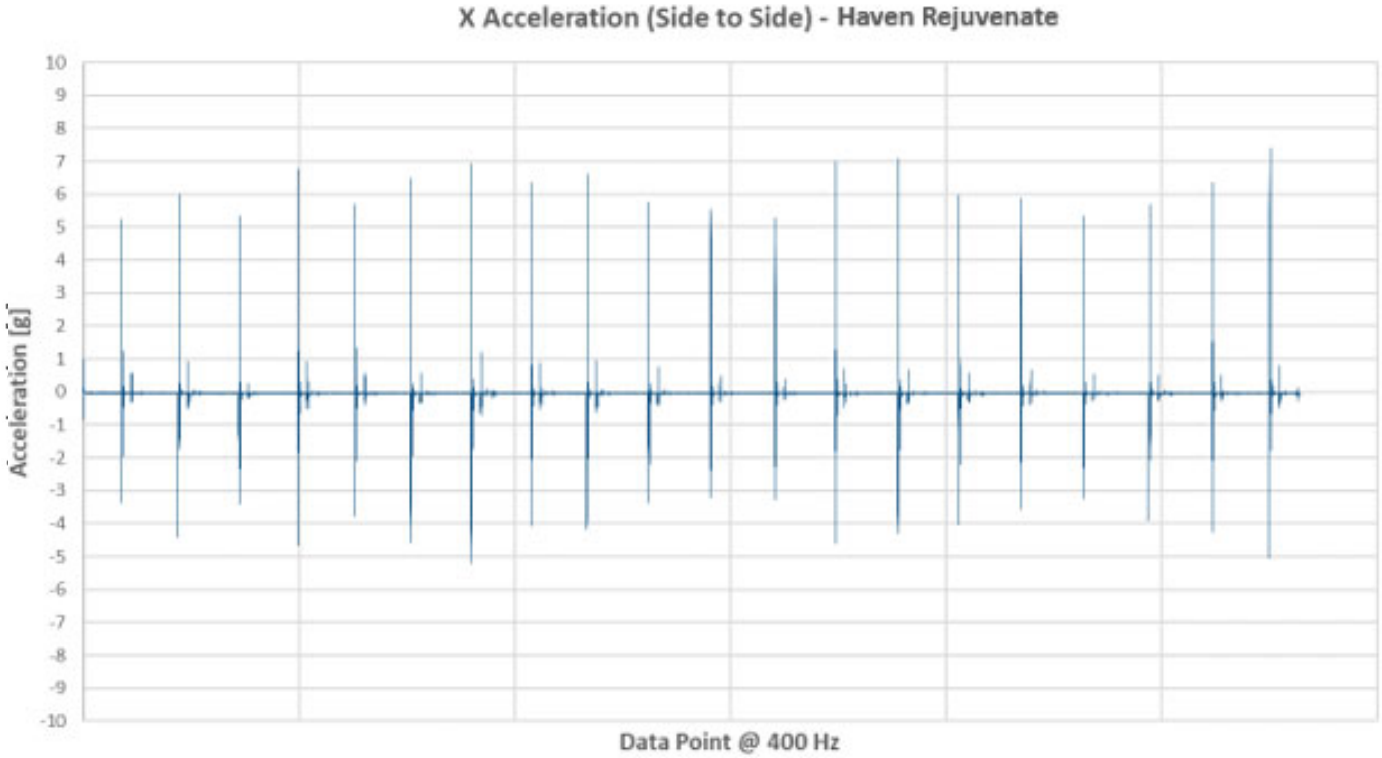


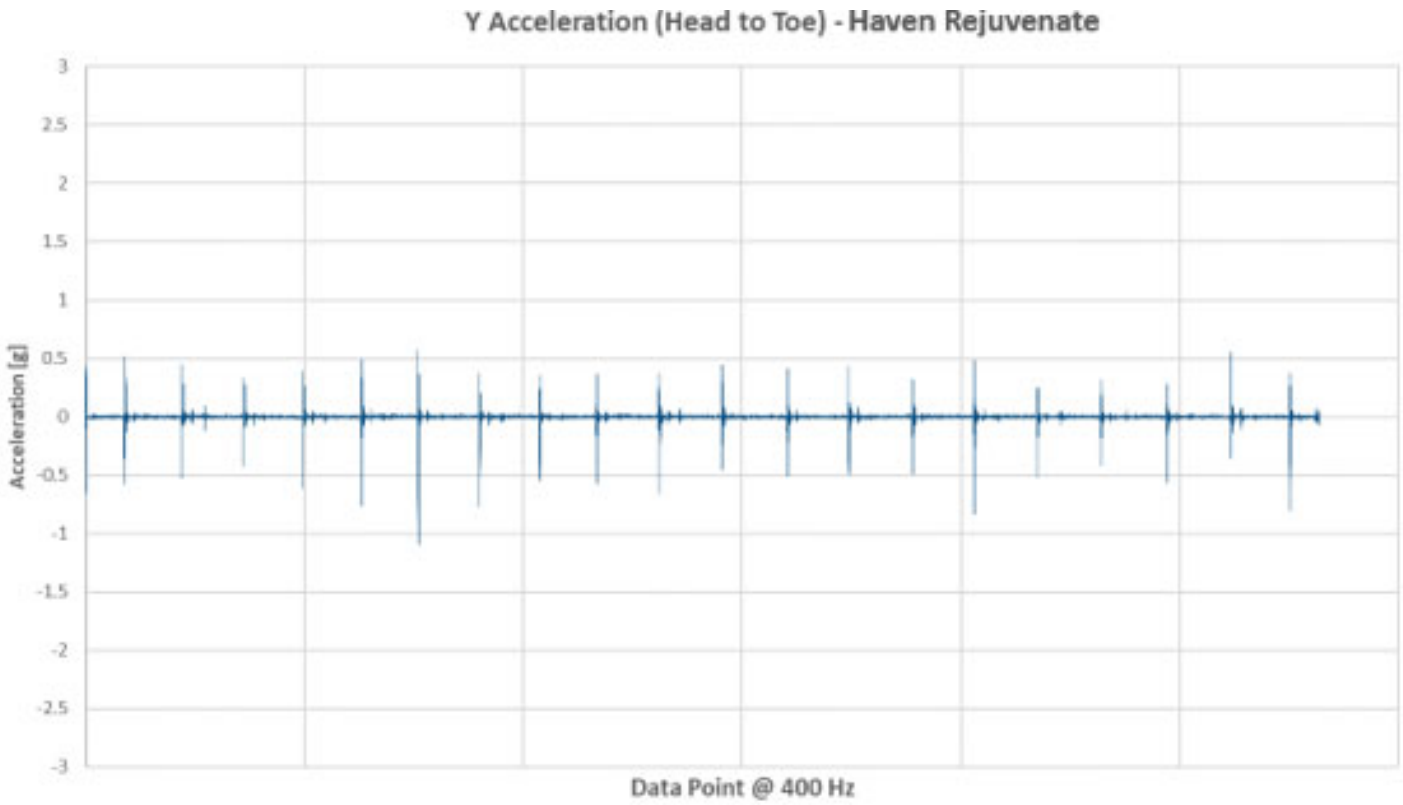

Y Acceleration (Head to Toe) - Casper Element
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

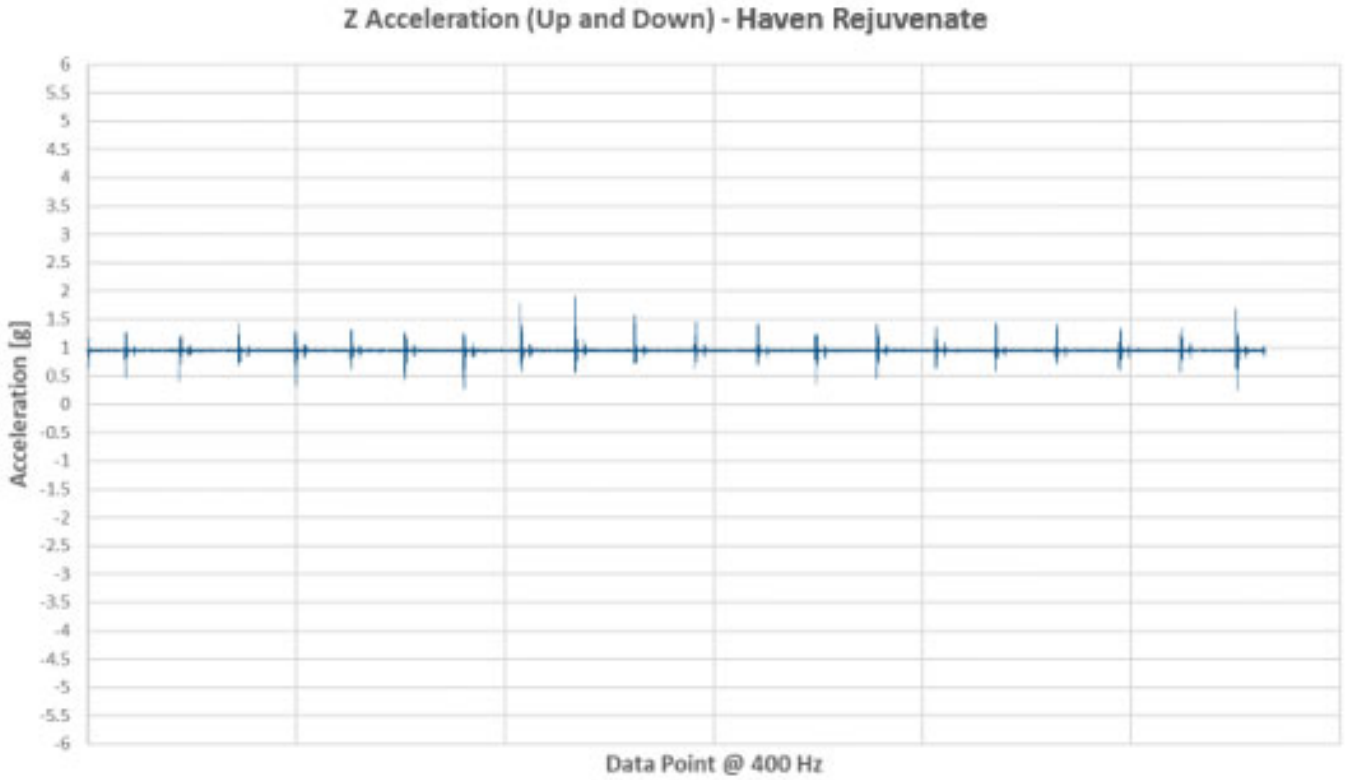

Z Acceleration (Up and Down) - Casper Element
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – HAVEN REJUVENATE

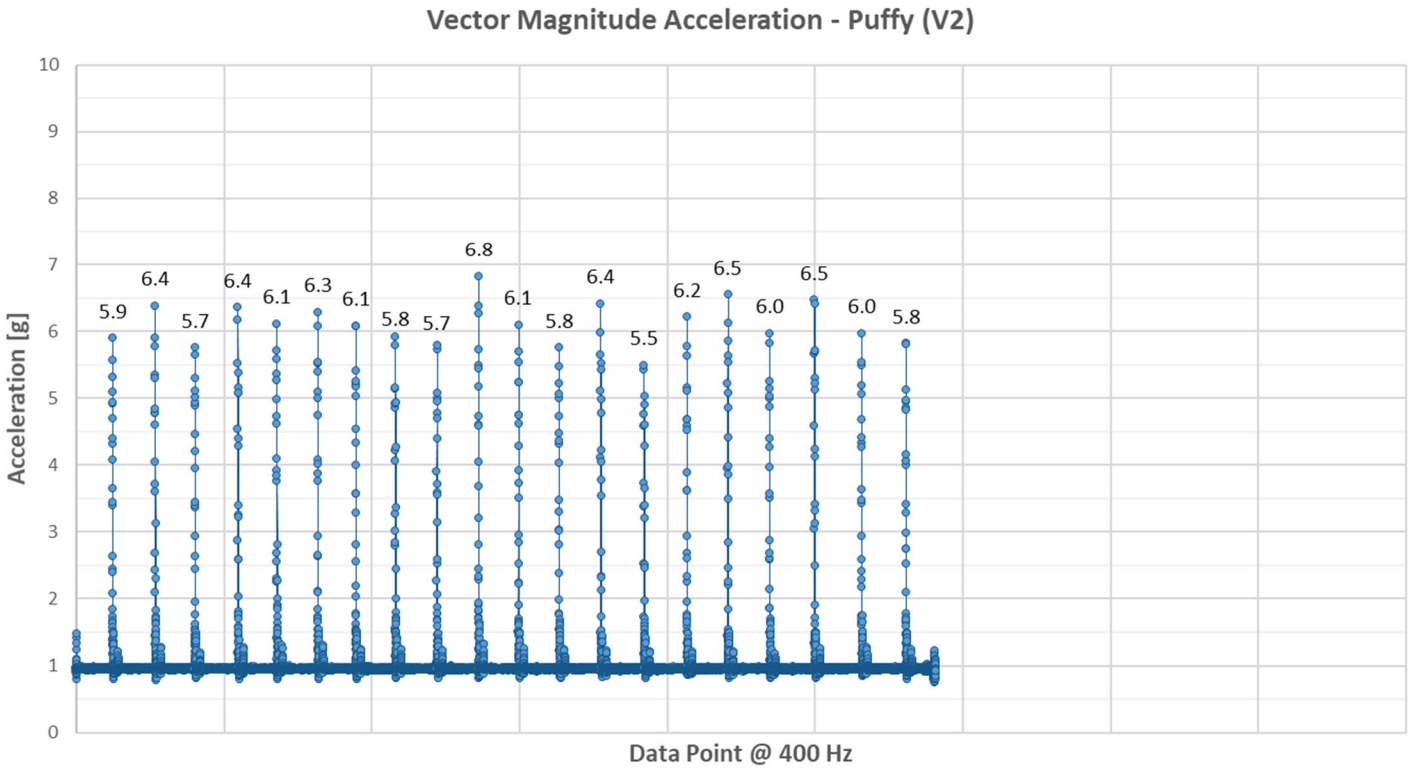


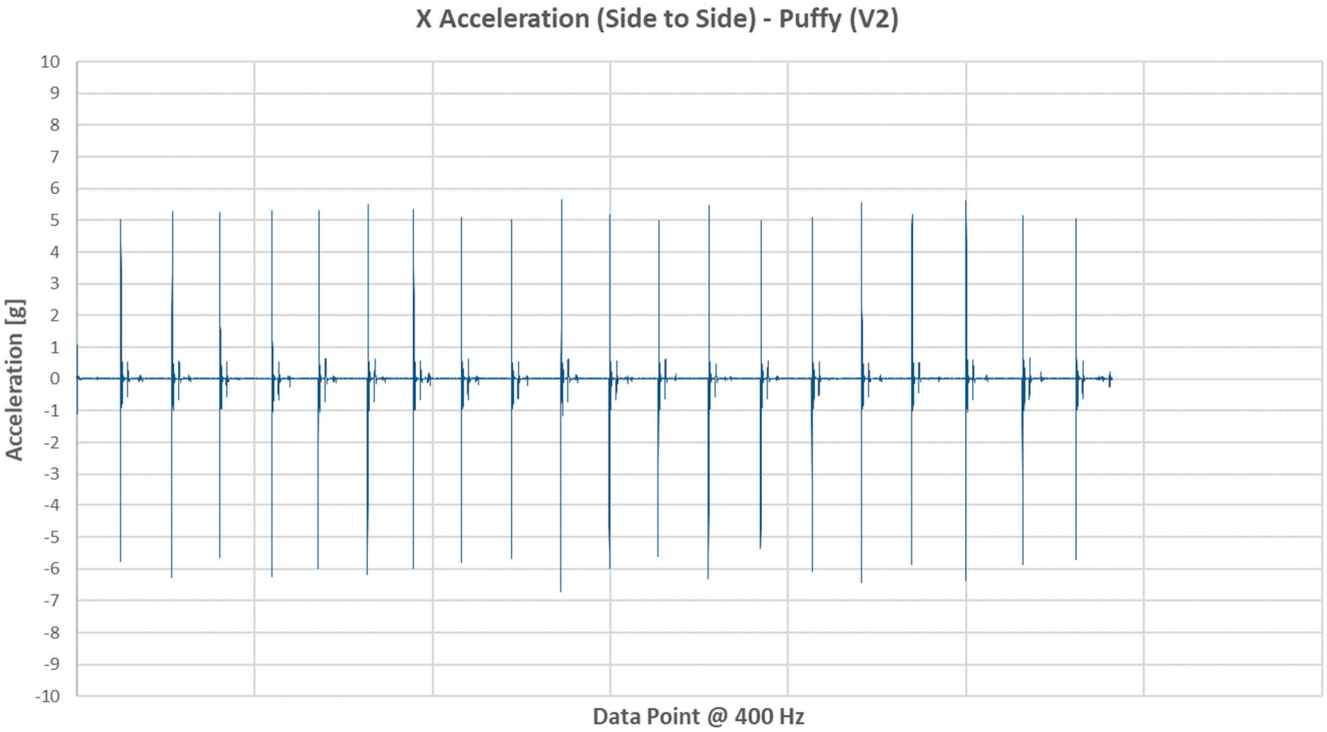


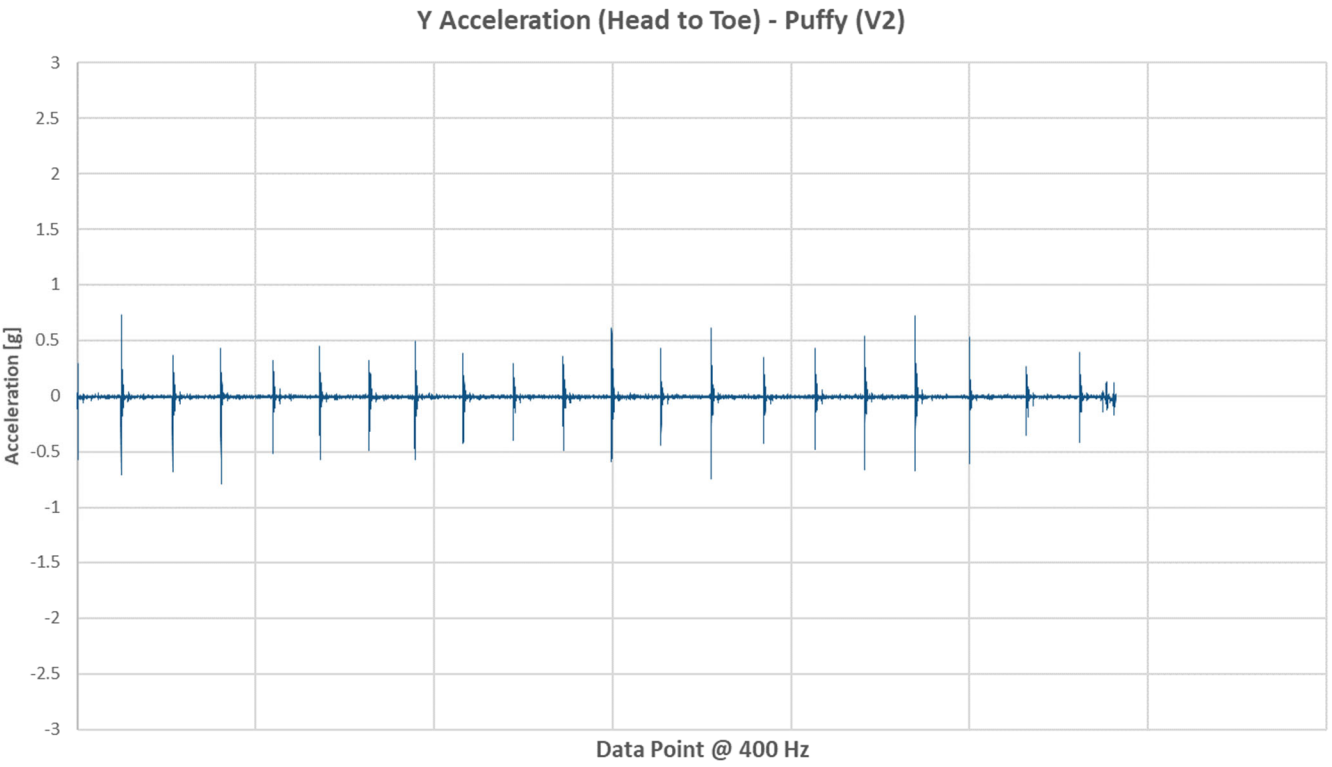

Y Acceleration (Head to Toe) - Haven Rejuvenate
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

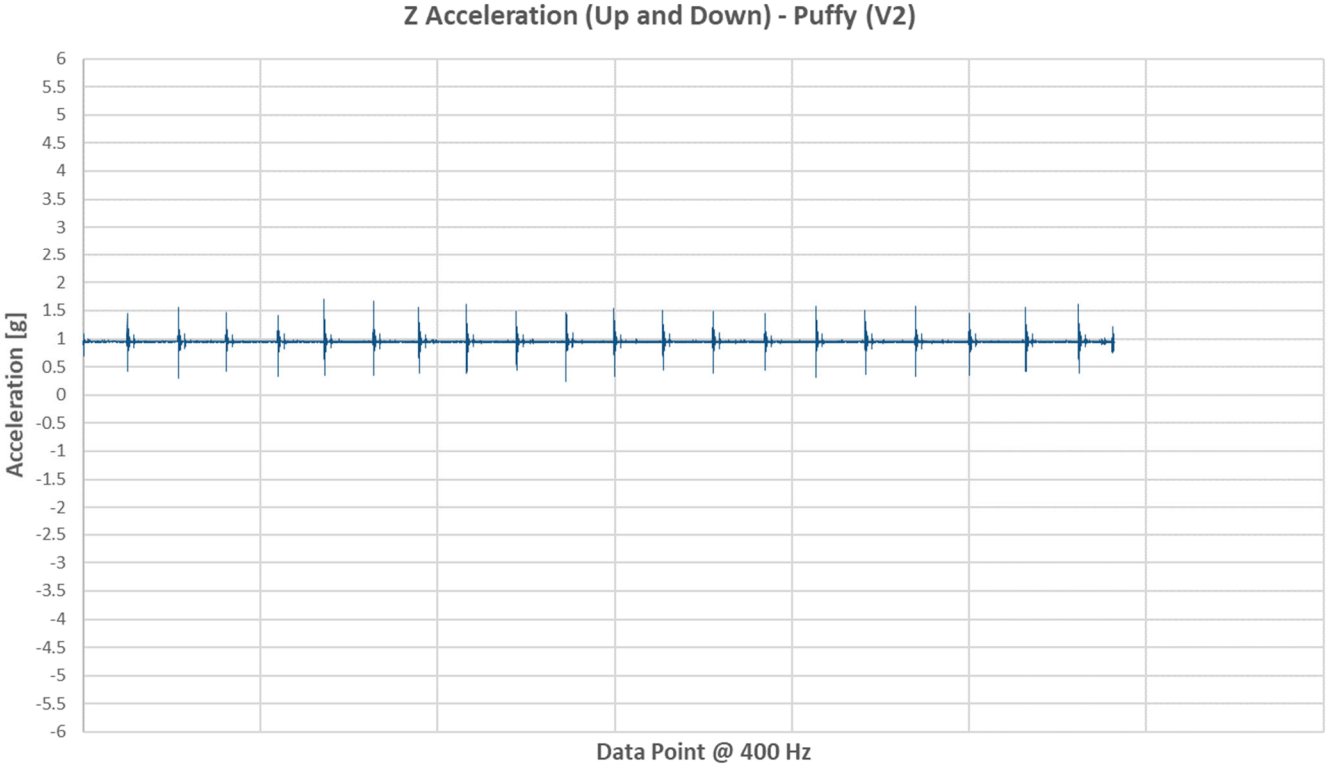

Z Acceleration (Up and Down) - Haven Rejuvenate
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – PUFFY (V2)

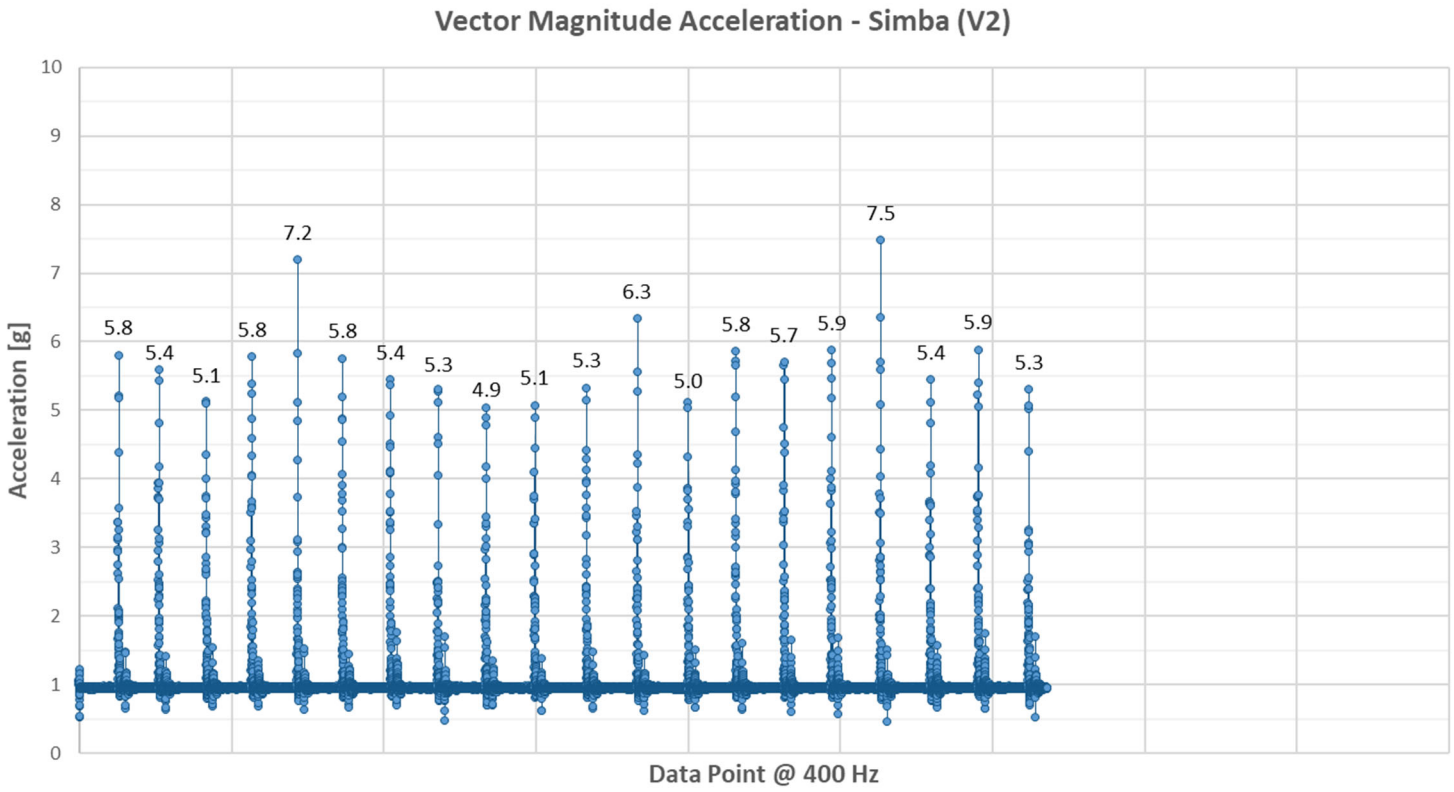


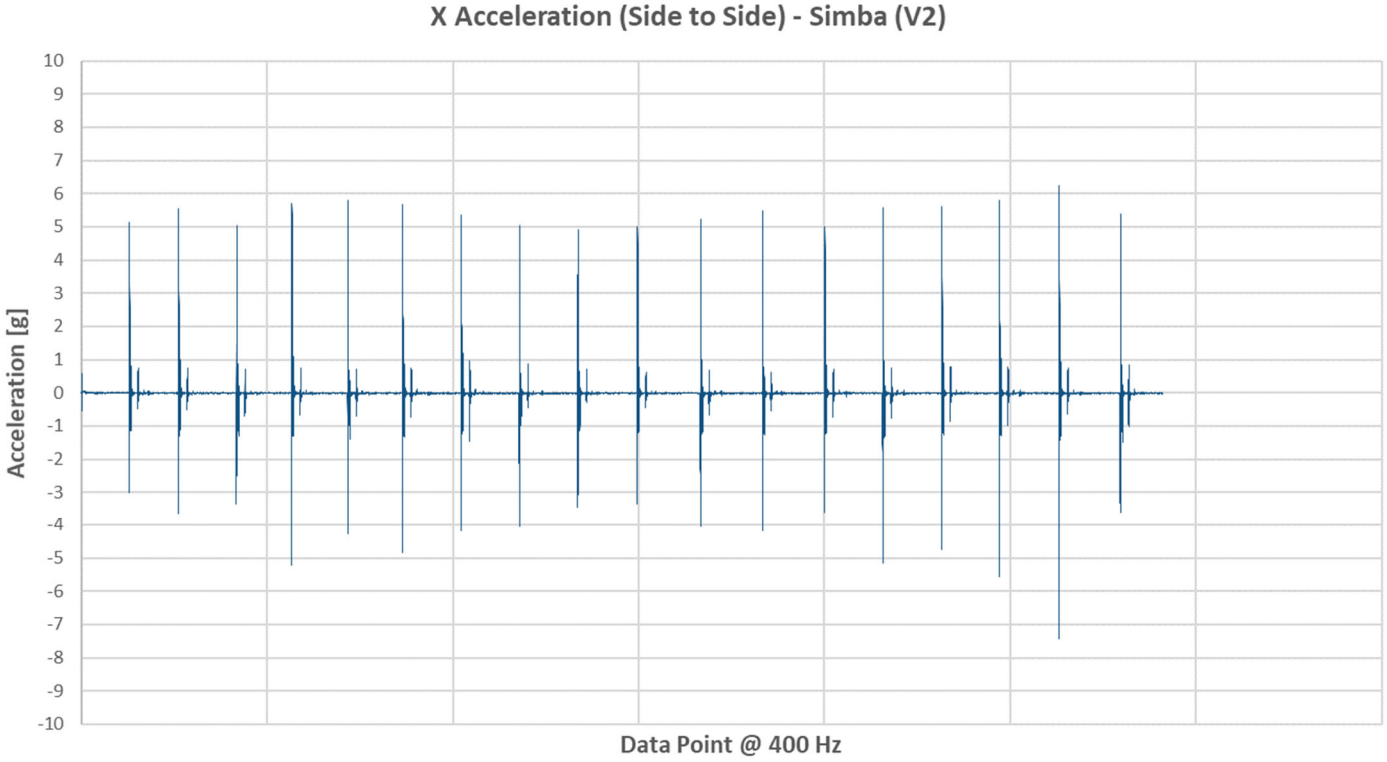


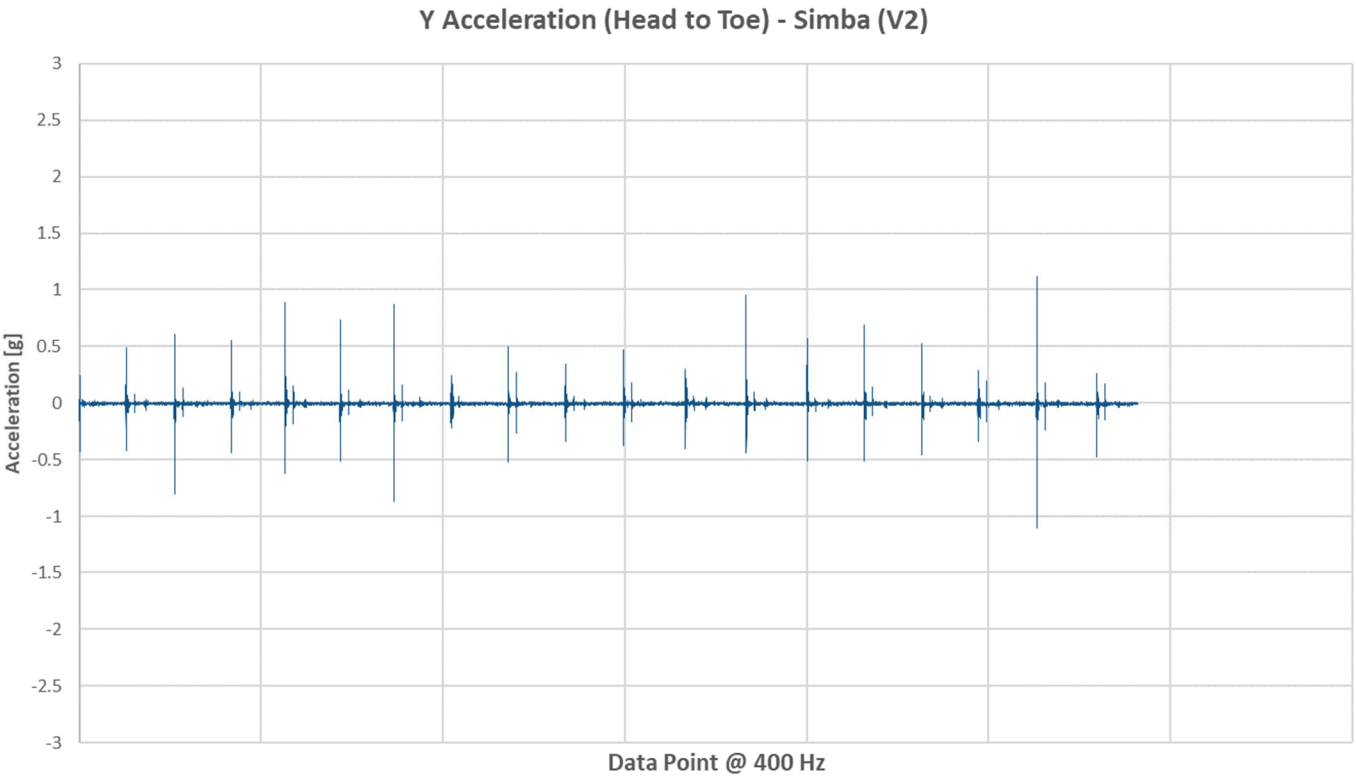

Y Acceleration (Head to Toe) - Puffy (V2)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

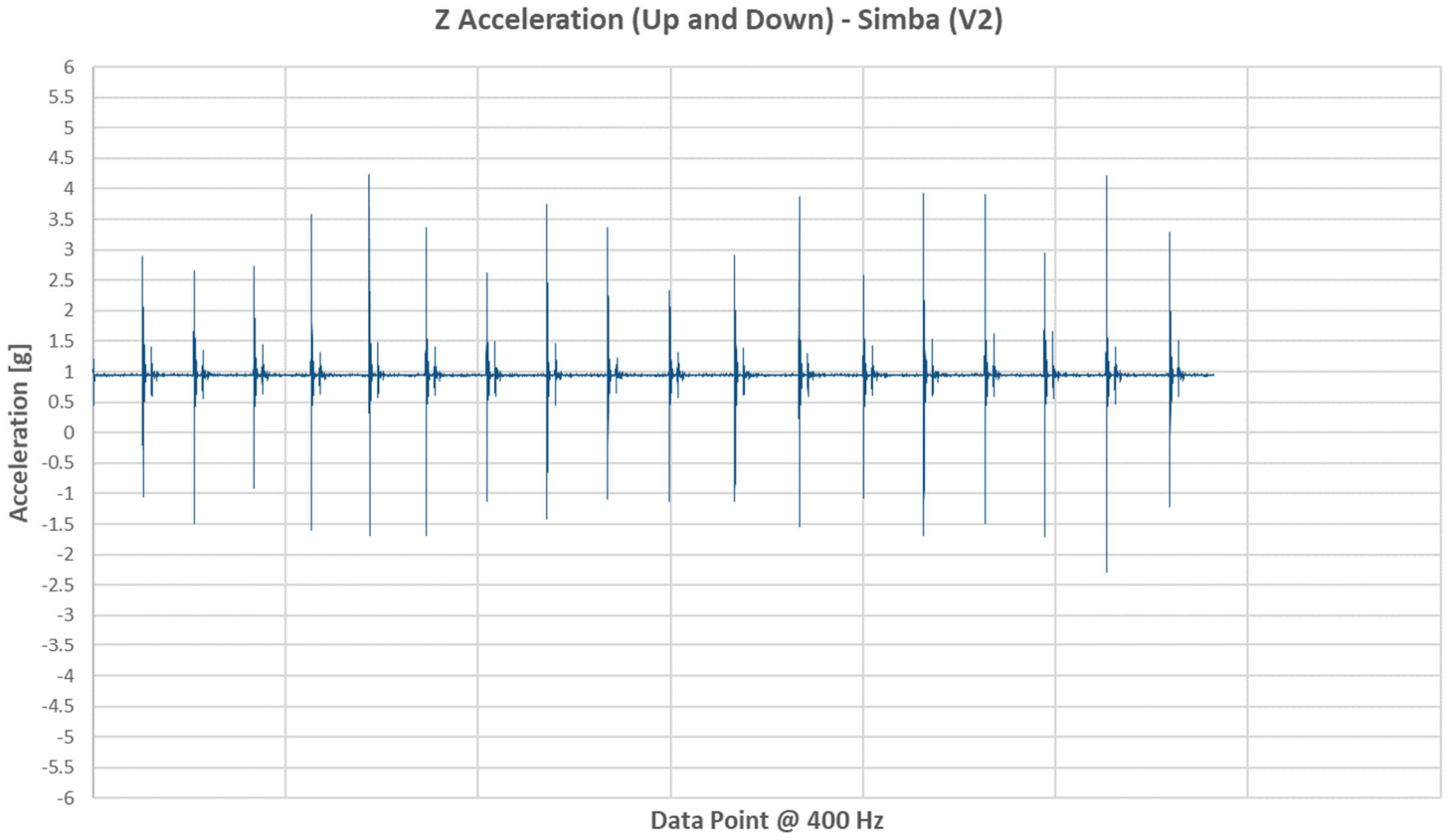

Z Acceleration (Up and Down) - Puffy (V2)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – SIMBA (V2)

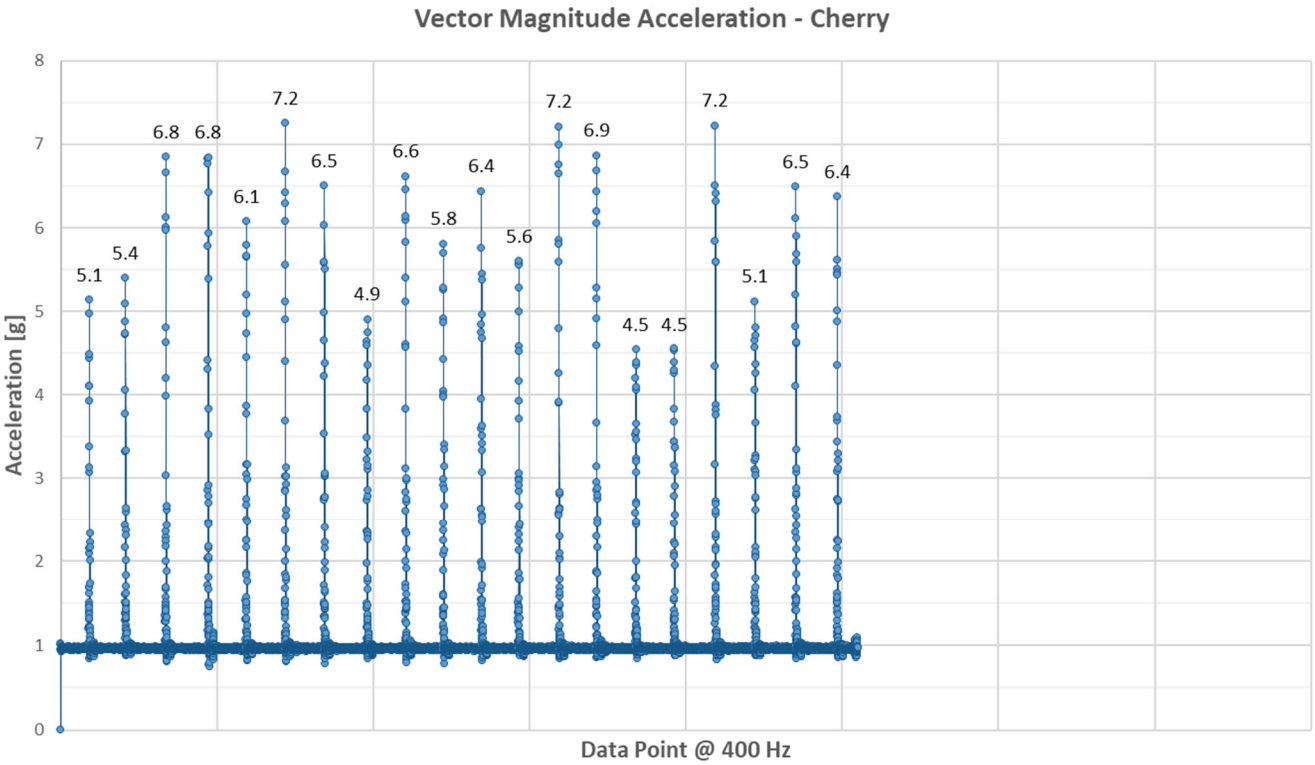


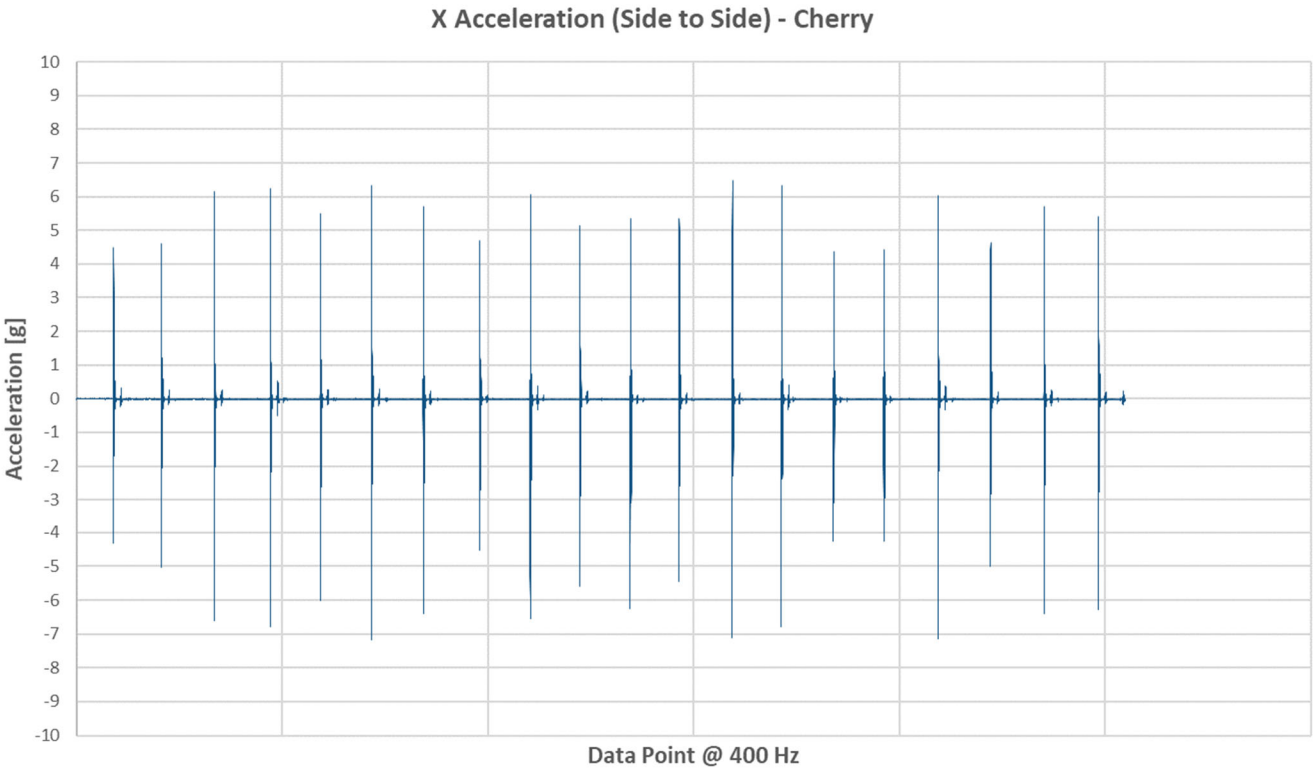


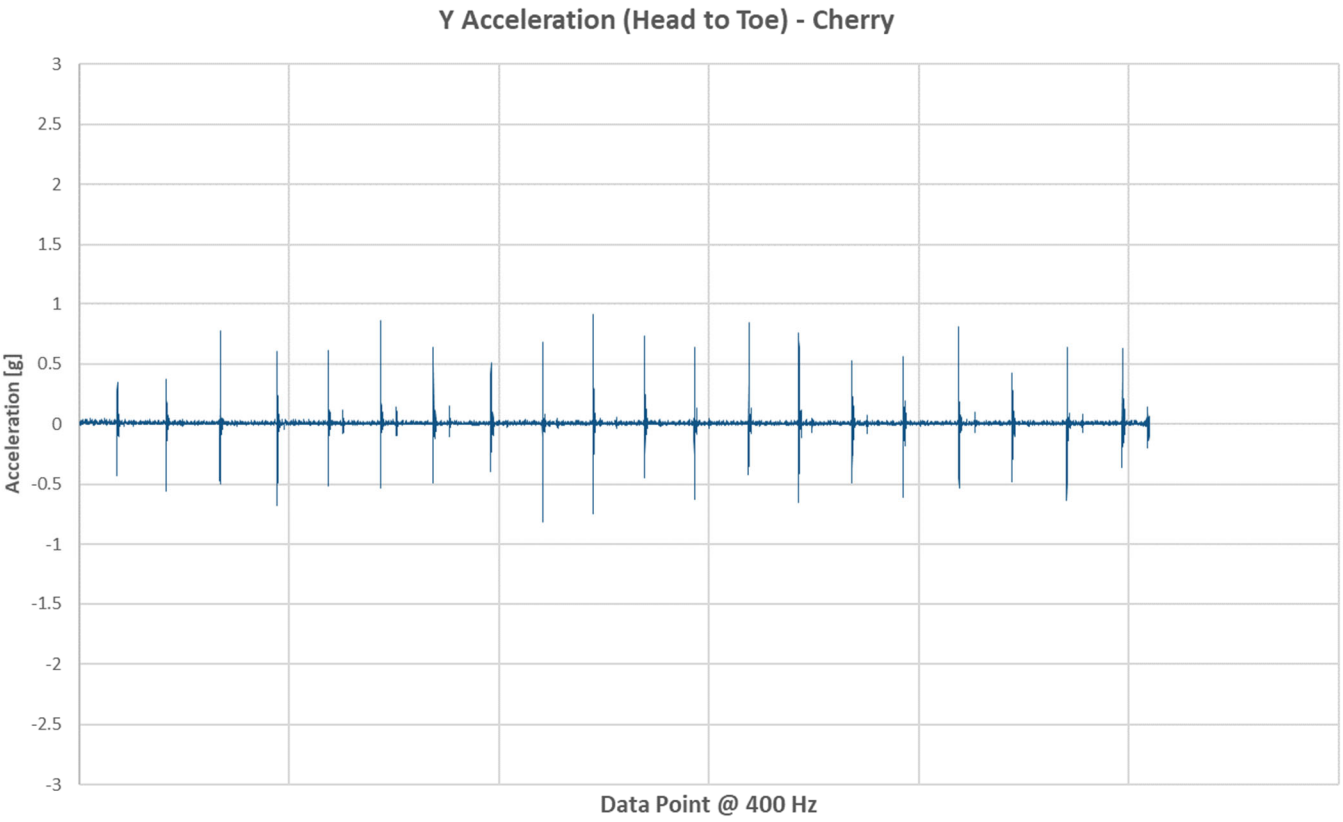

Y Acceleration (Head to Toe) - Simba (V2)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

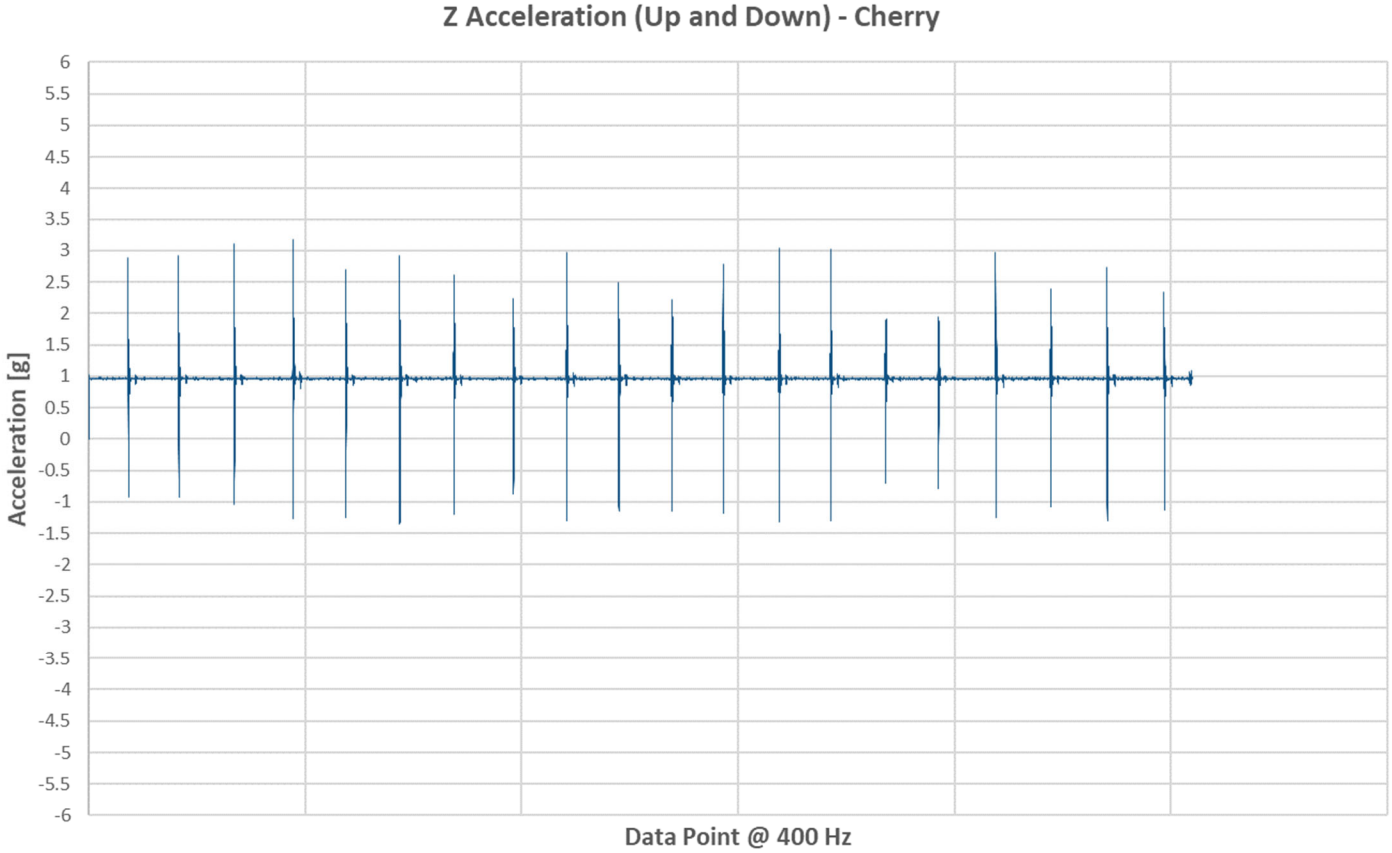

Z Acceleration (Up and Down) - Simba (V2)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – CHERRY

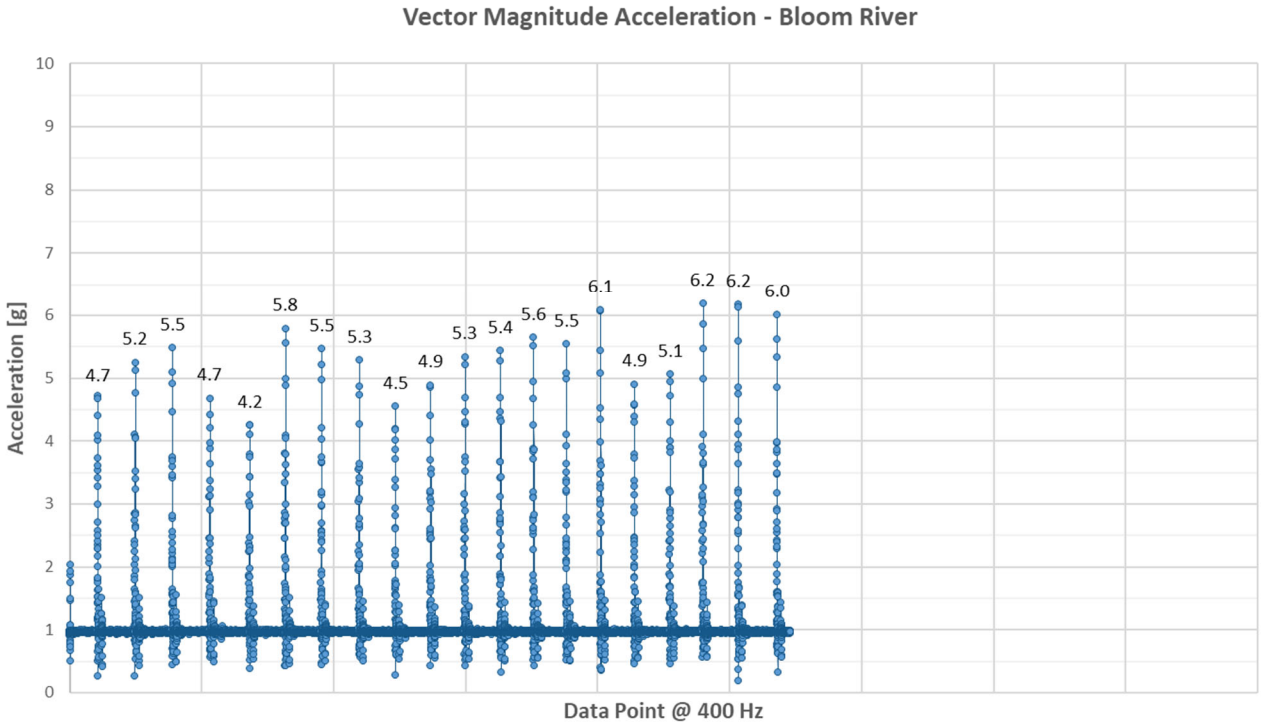


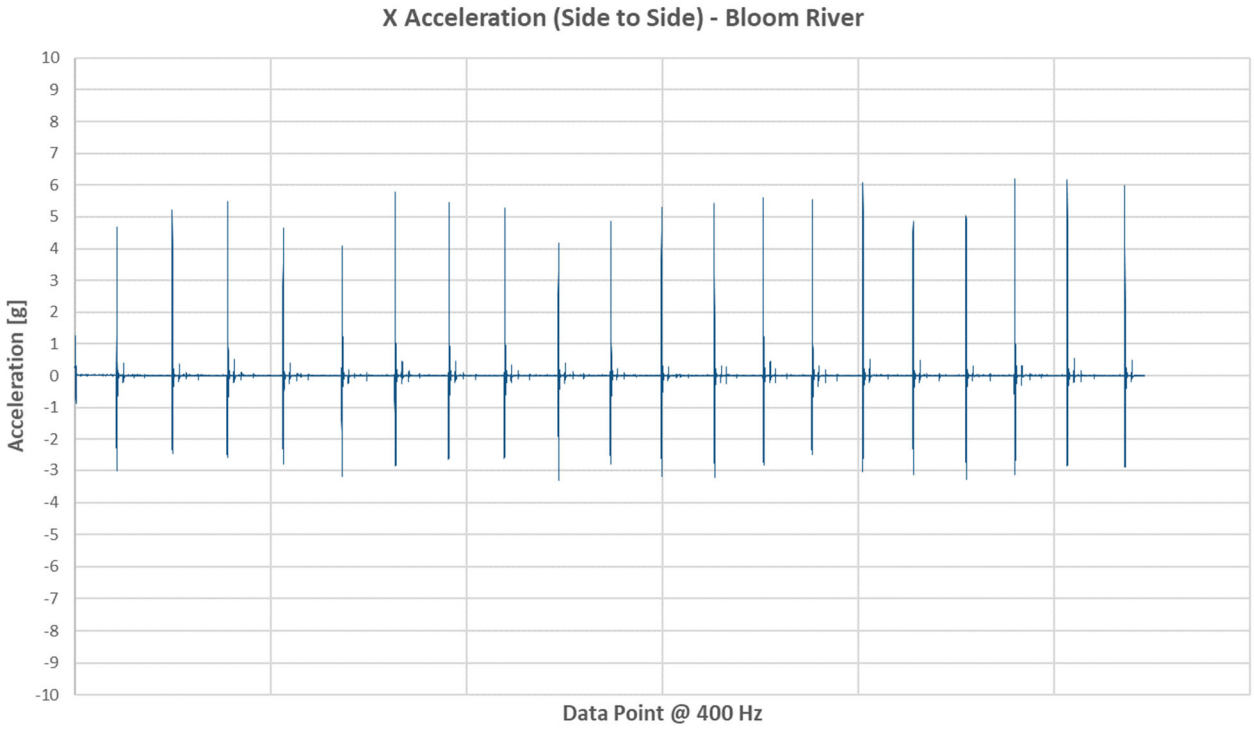


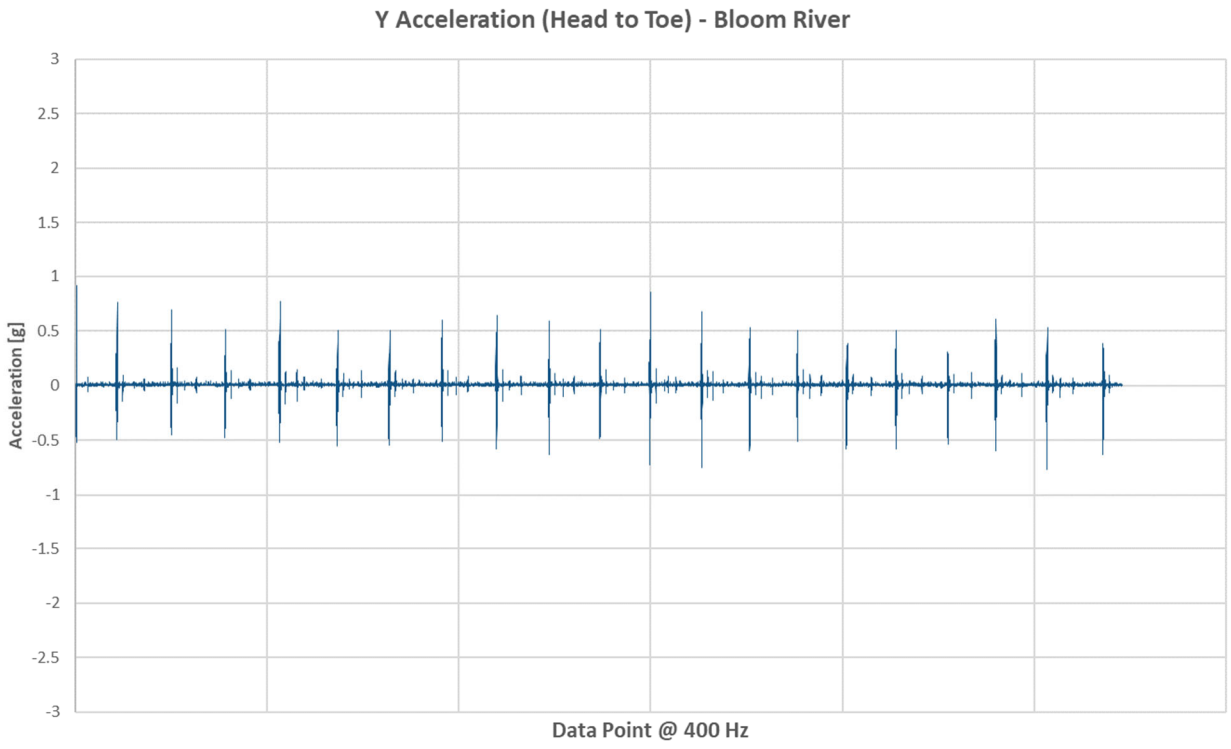

Y Acceleration (Head to Toe) - Cherry
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

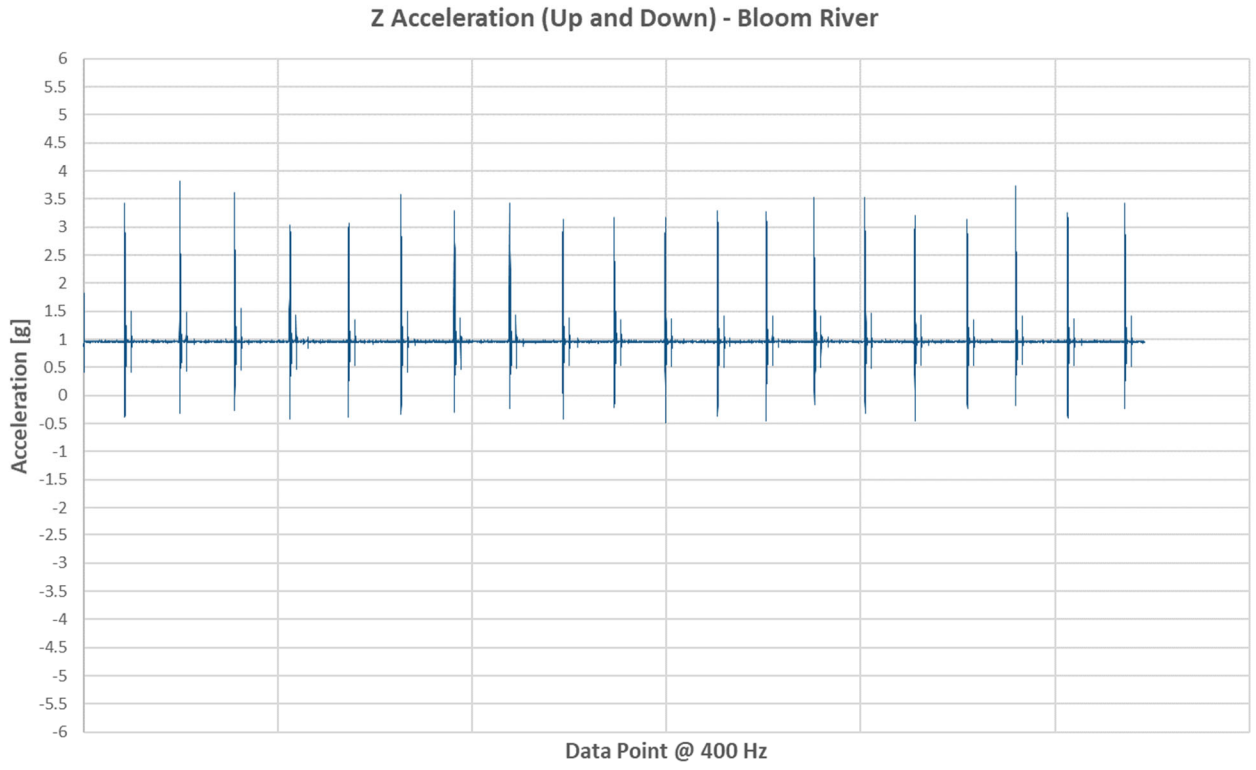

Z Acceleration (Up and Down) - Cherry
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – BLOOM RIVER

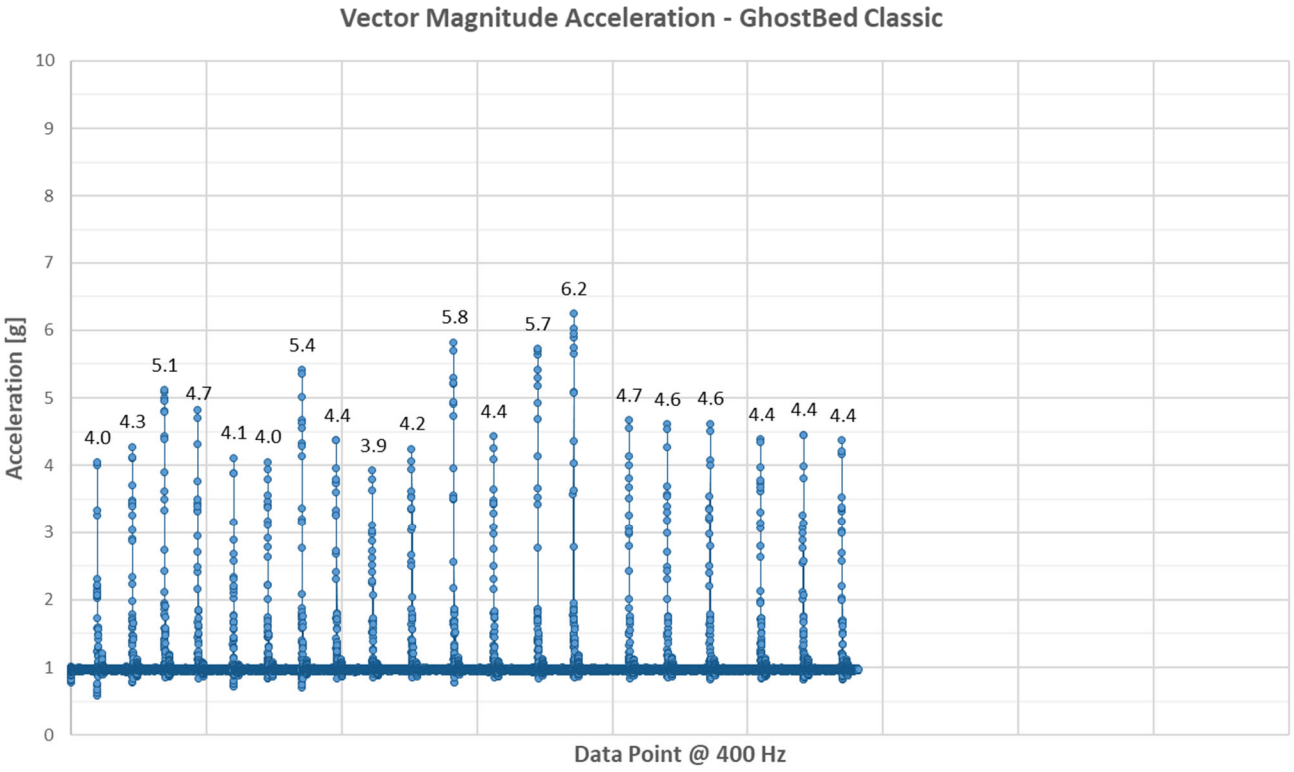


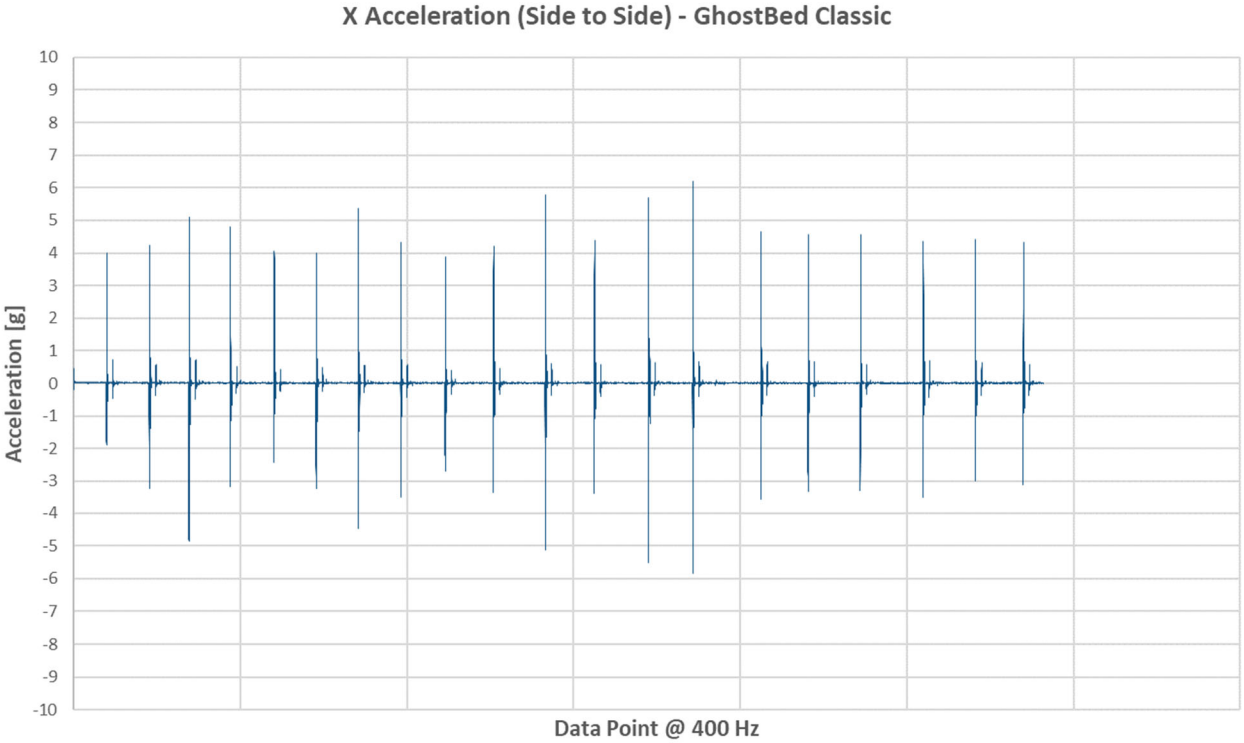


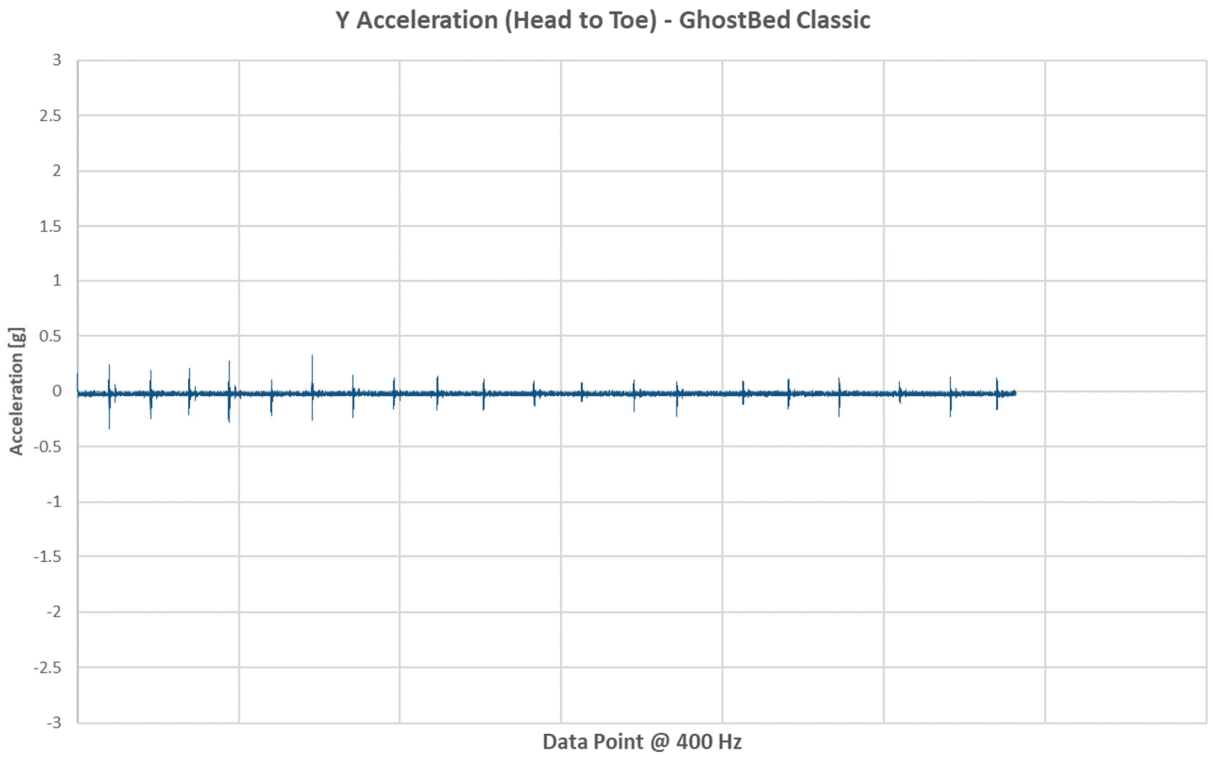

Y Acceleration (Head to Toe) - Bloom River
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz


Z Acceleration (Up and Down) - Bloom River
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – GHOSTBED CLASSIC

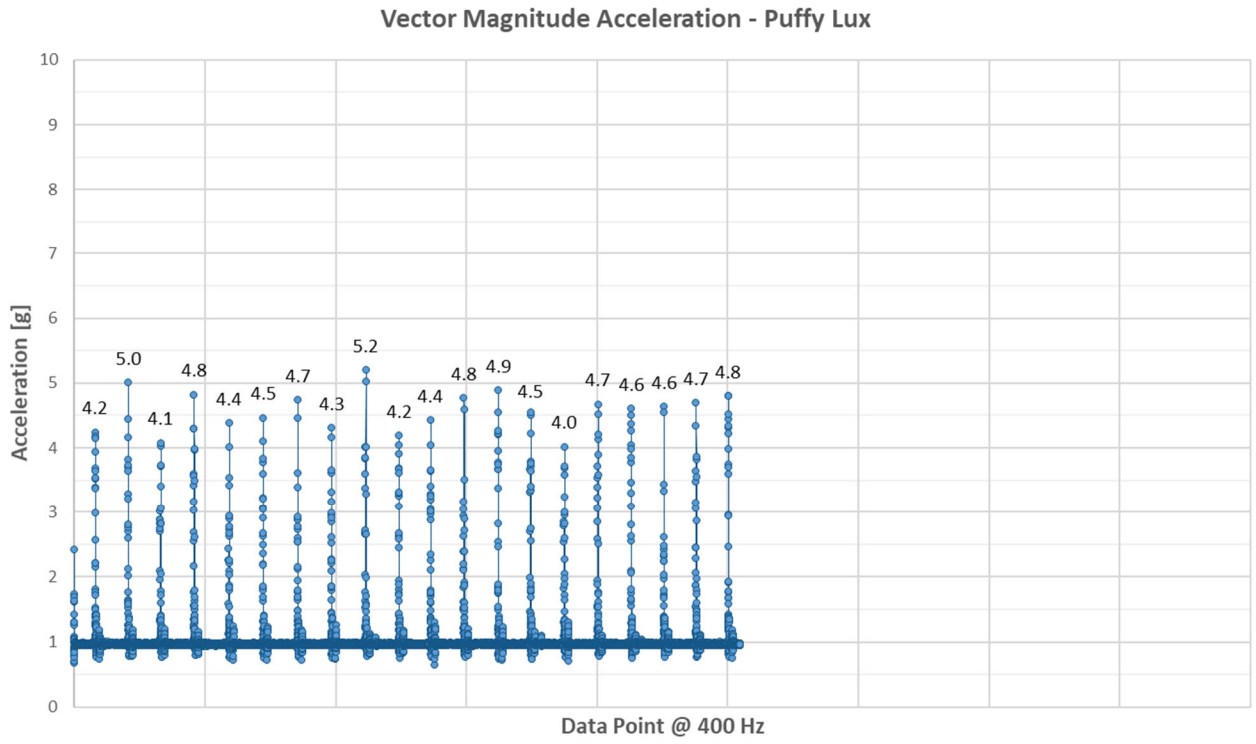


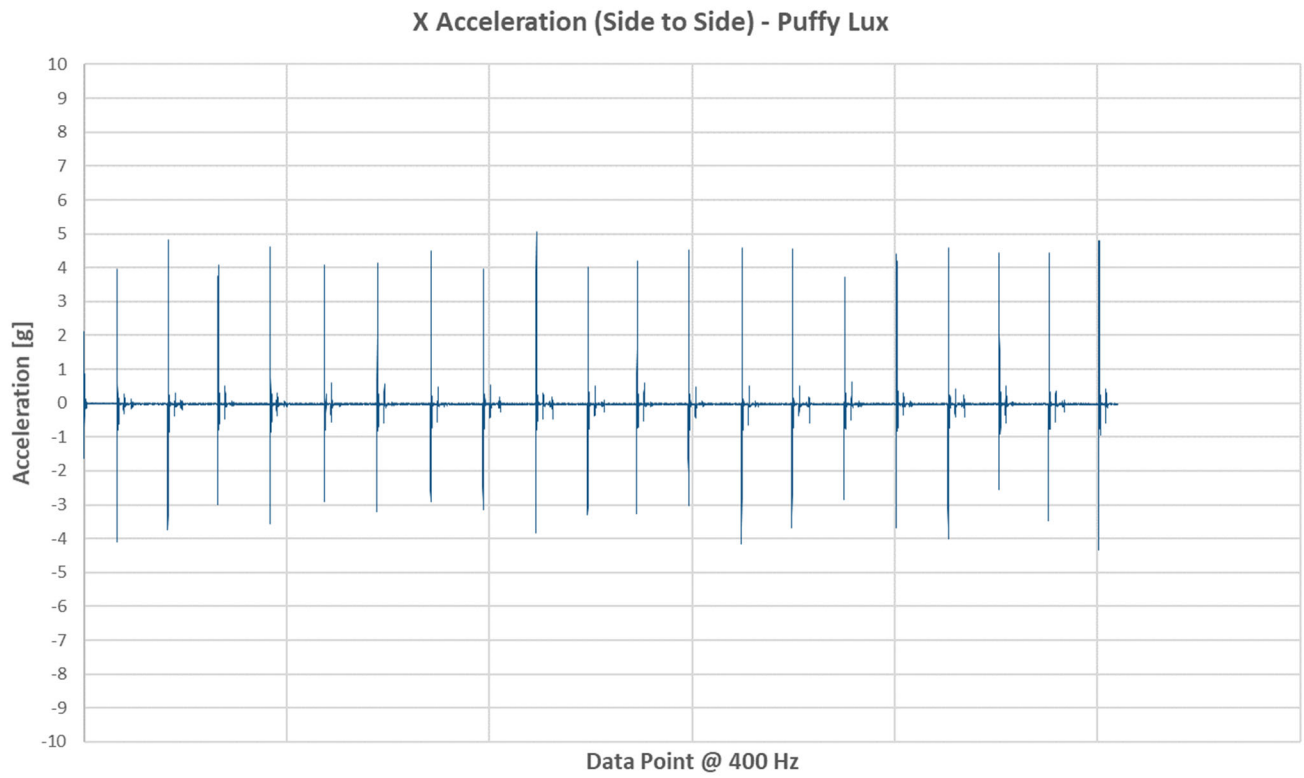


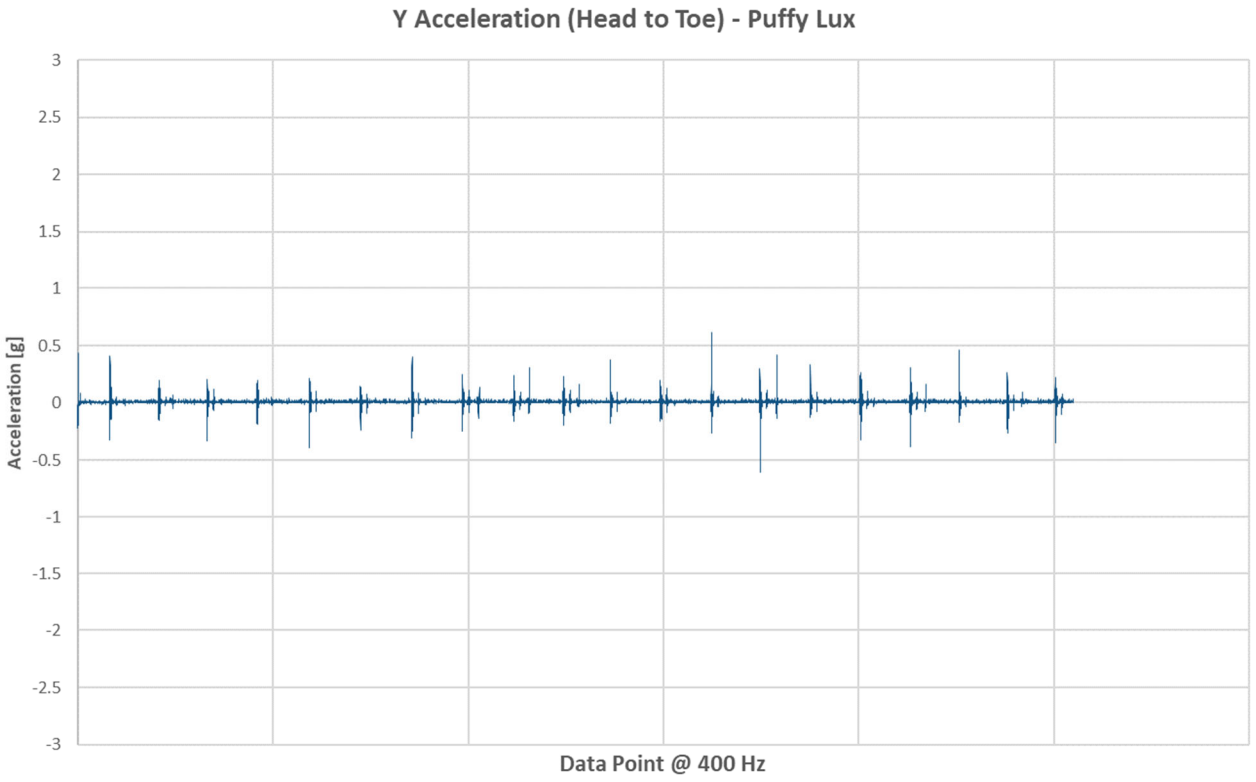

Y Acceleration (Head to Toe) - GhostBed Classic
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

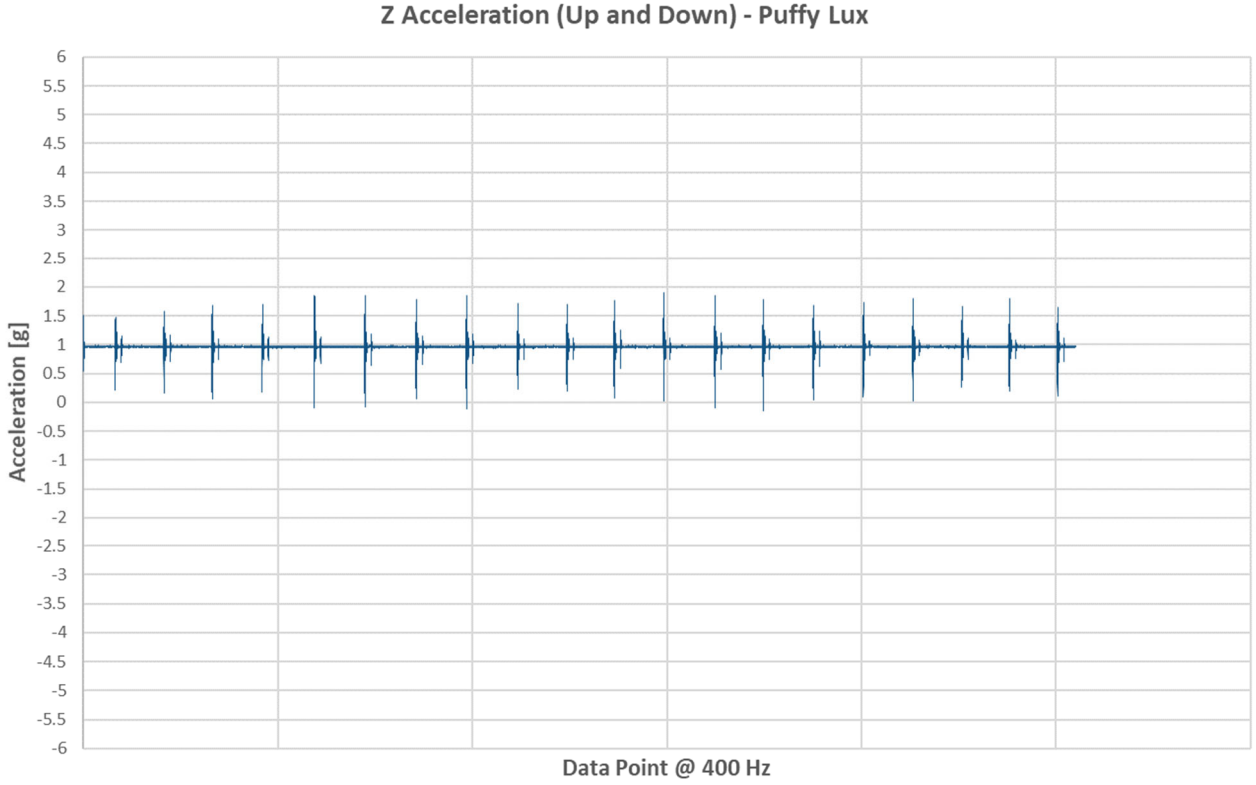
Z Acceleration (Up and Down) - GhostBed Classic
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – PUFFY LUX

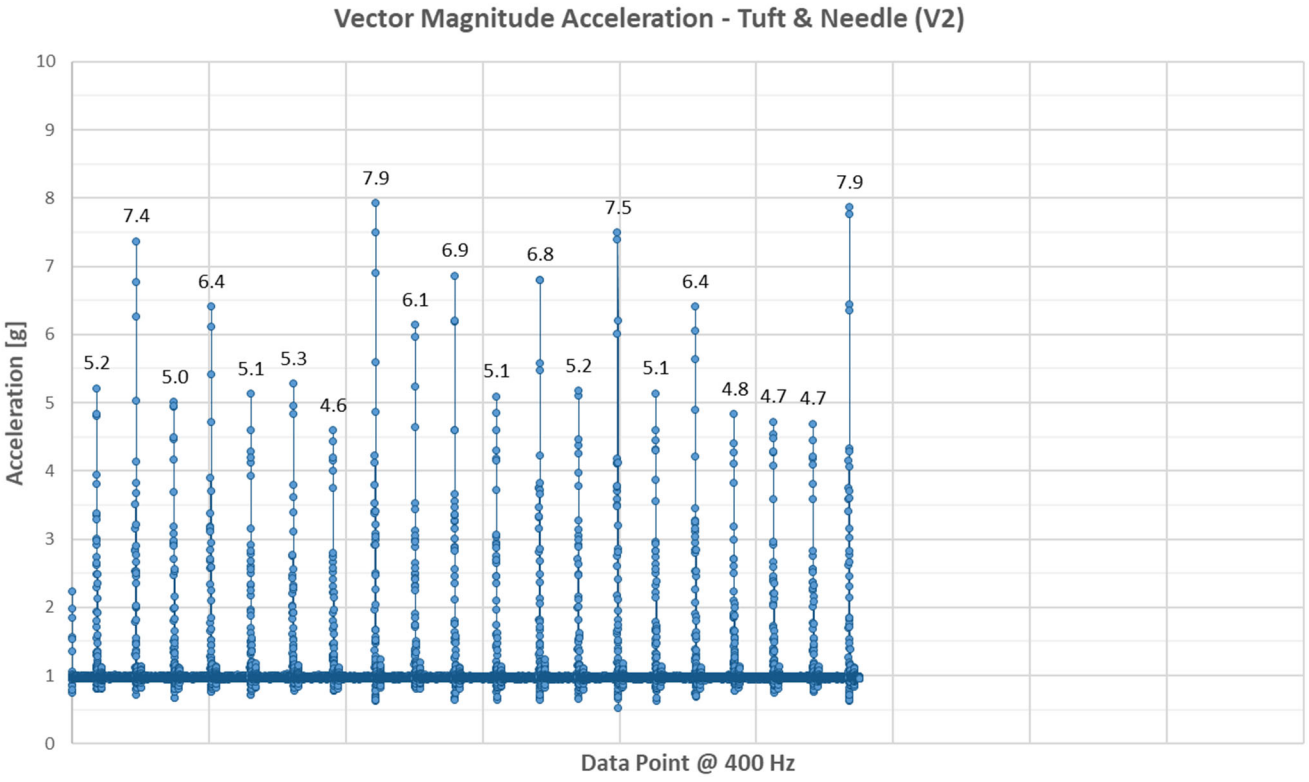


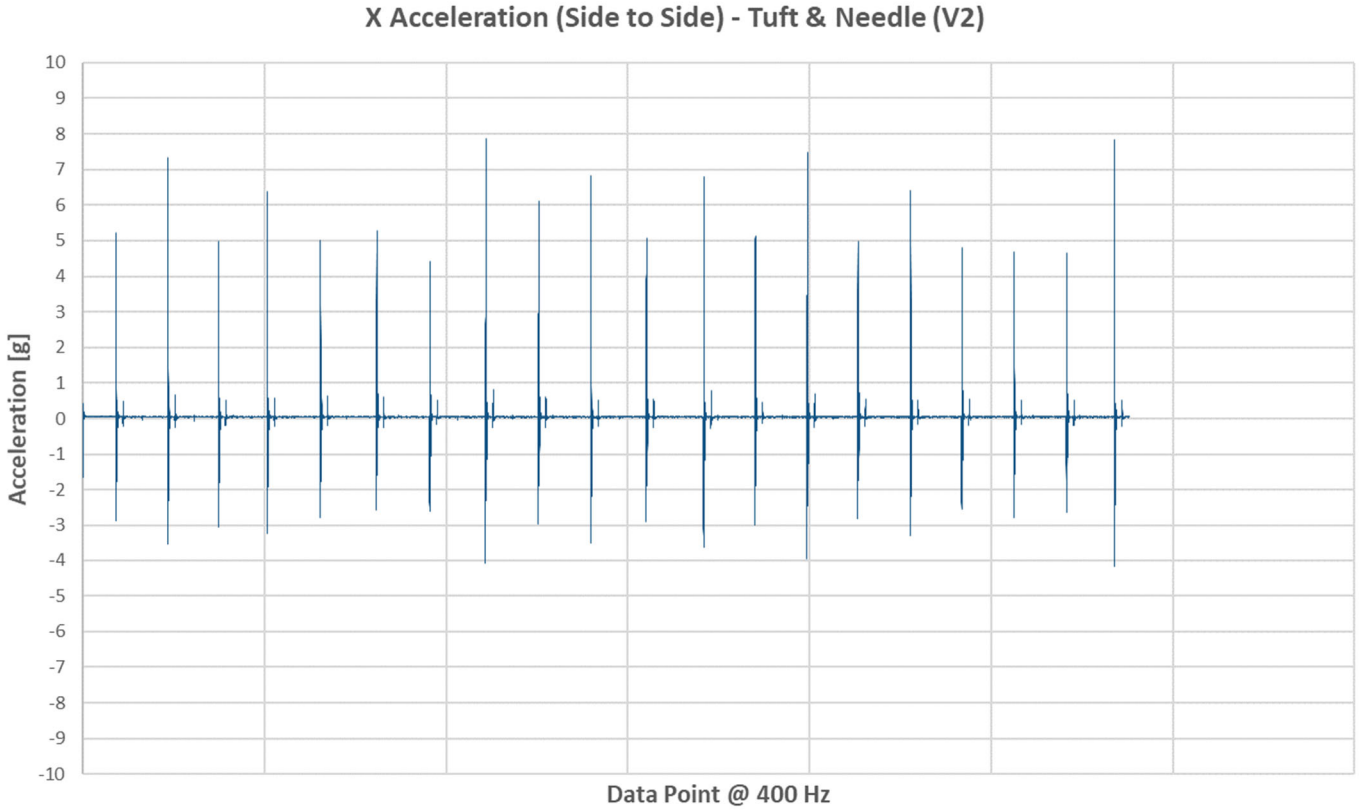


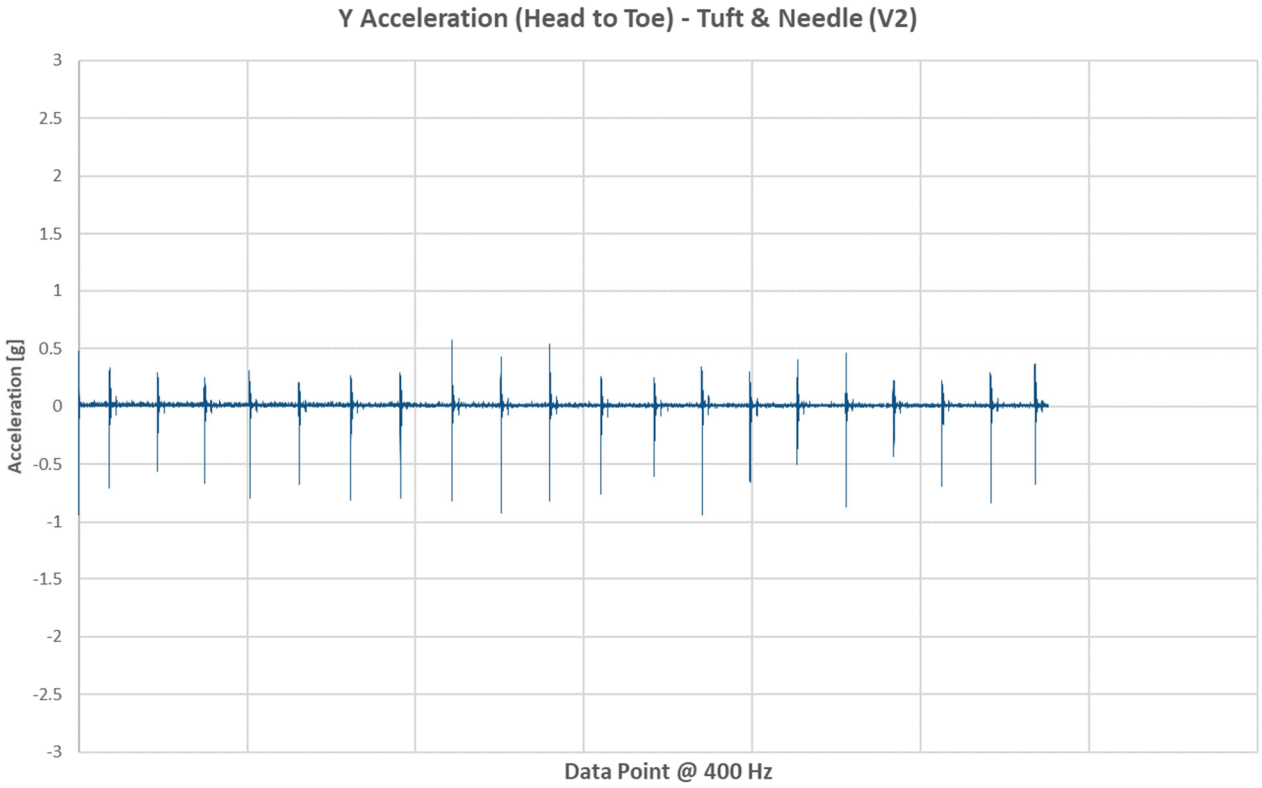

Y Acceleration (Head to Toe) - Puffy Lux
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

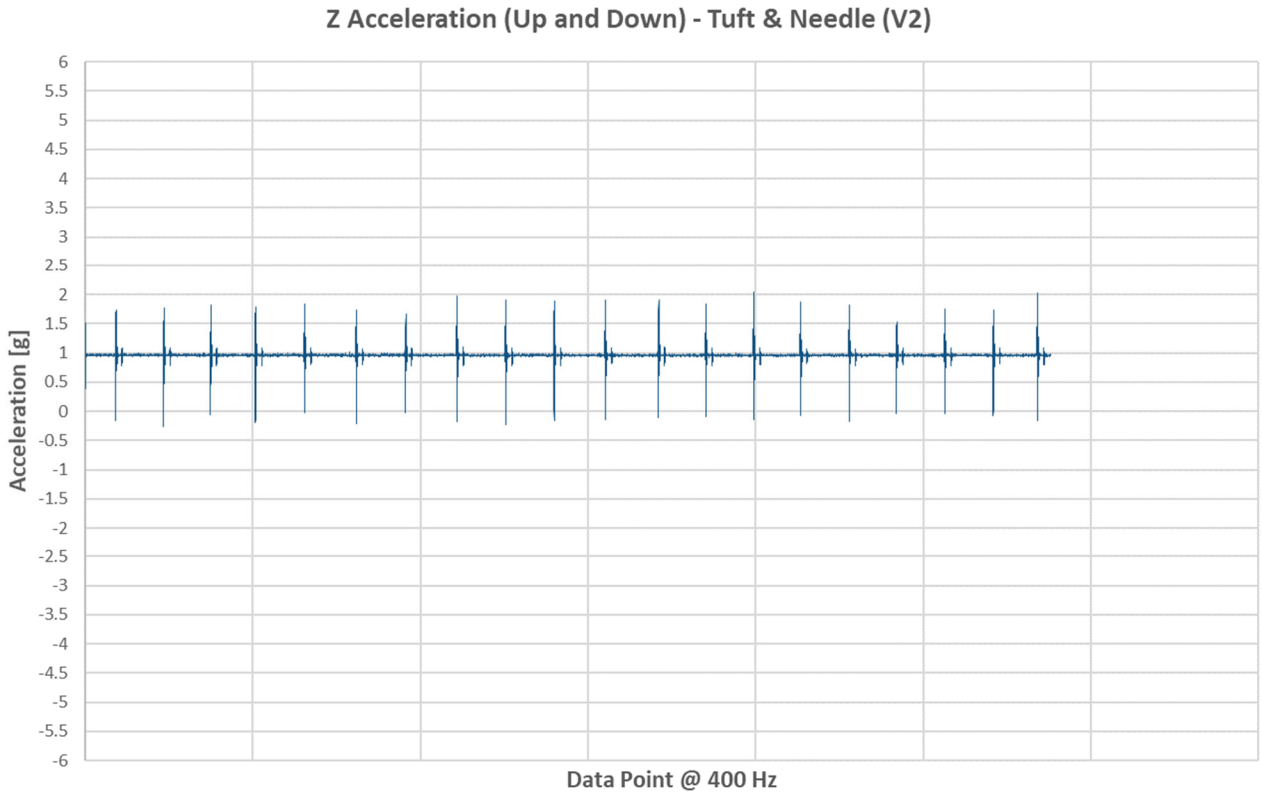

Z Acceleration (Up and Down) - Puffy Lux
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – TUFT & NEEDLE (V2)

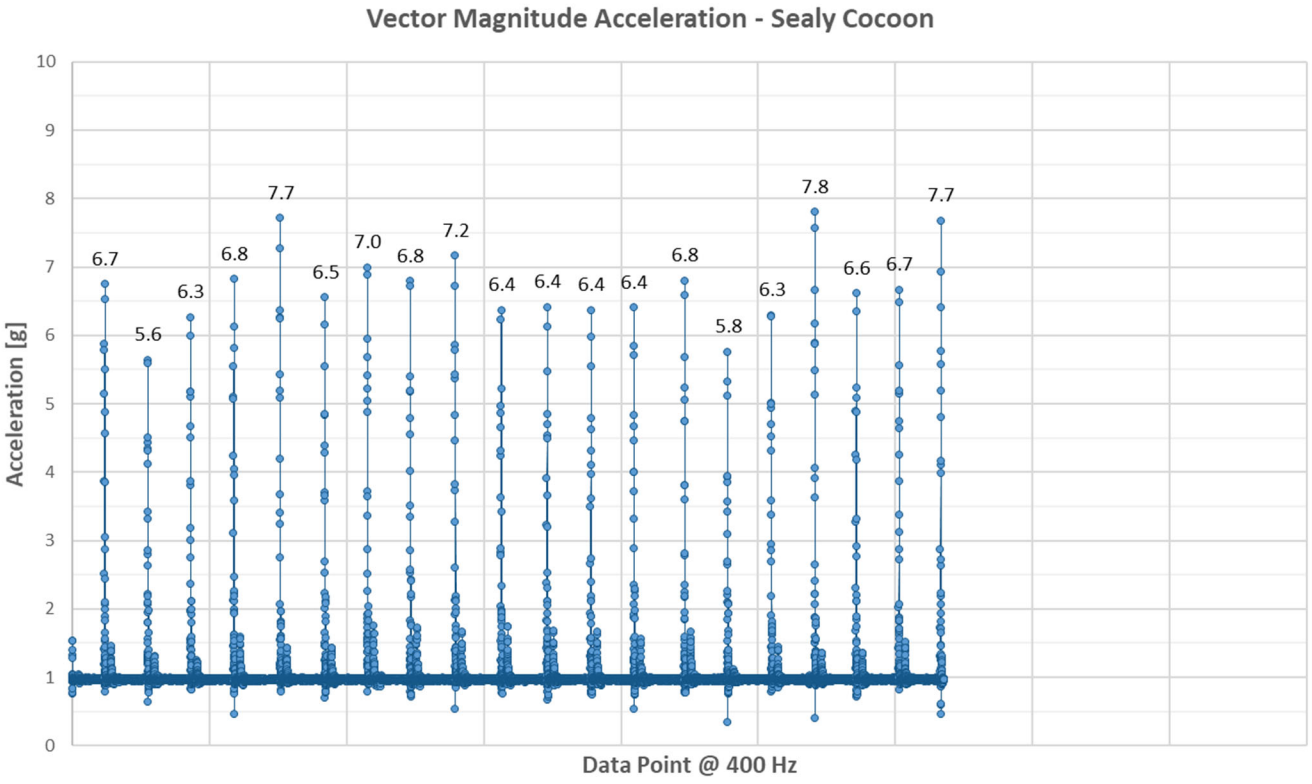


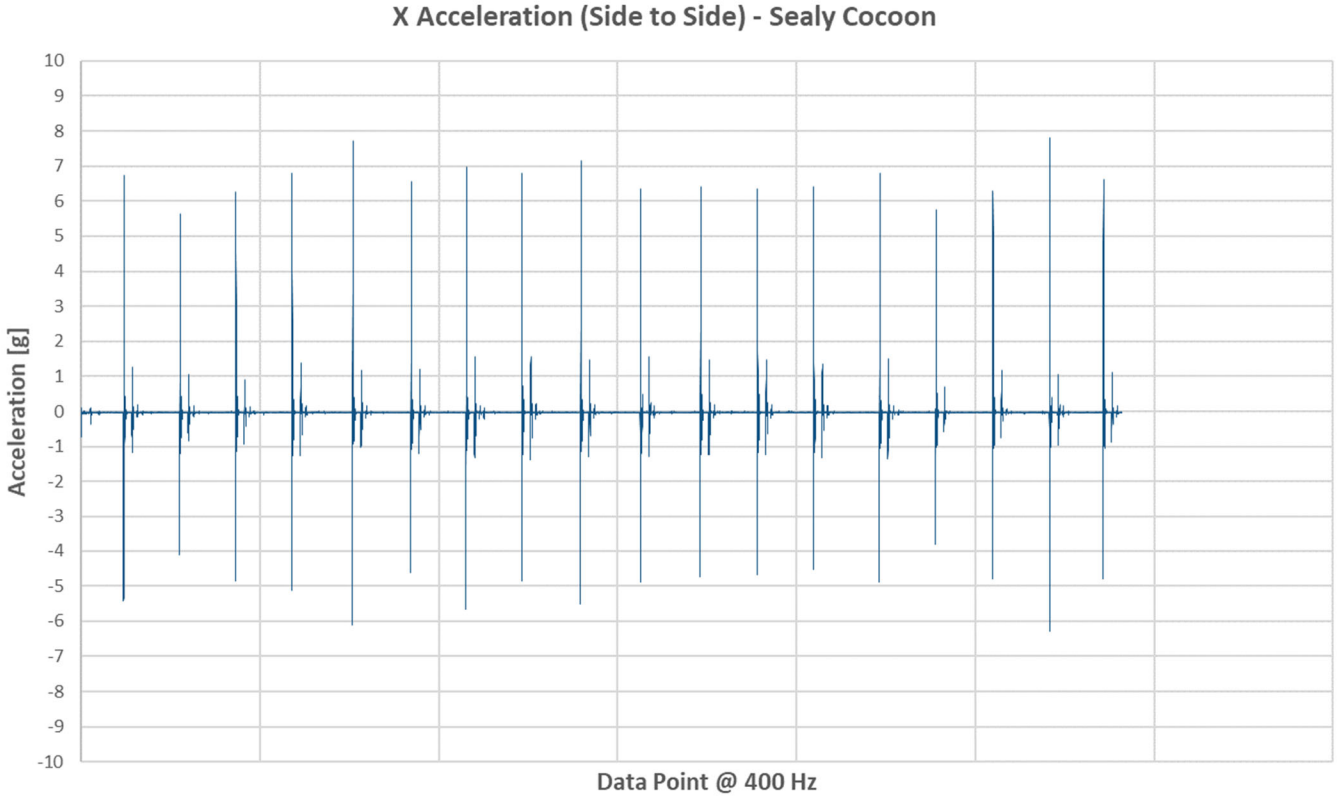


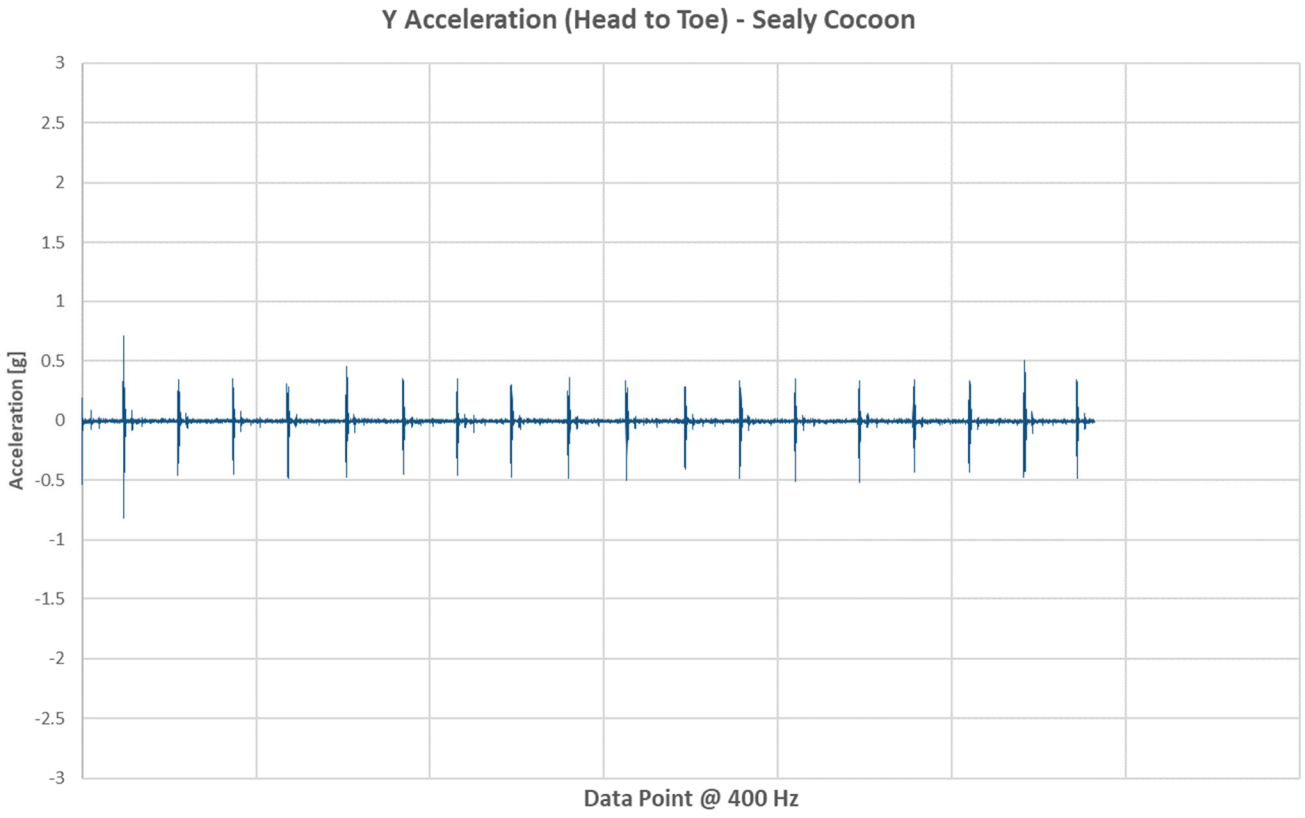

Y Acceleration (Head to Toe) - Tuft & Needle (V2)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

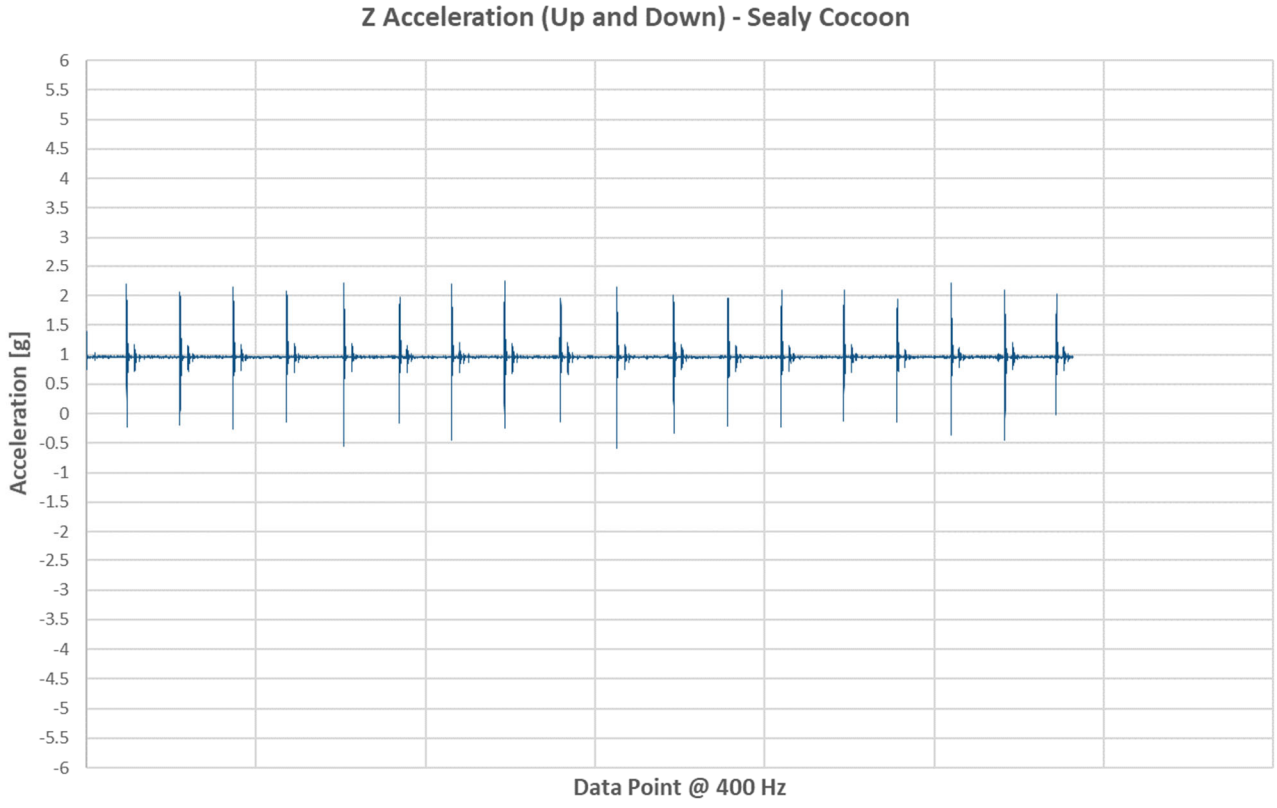

Z Acceleration (Up and Down) - Tuft & Needle (V2)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – SEALY COCOON

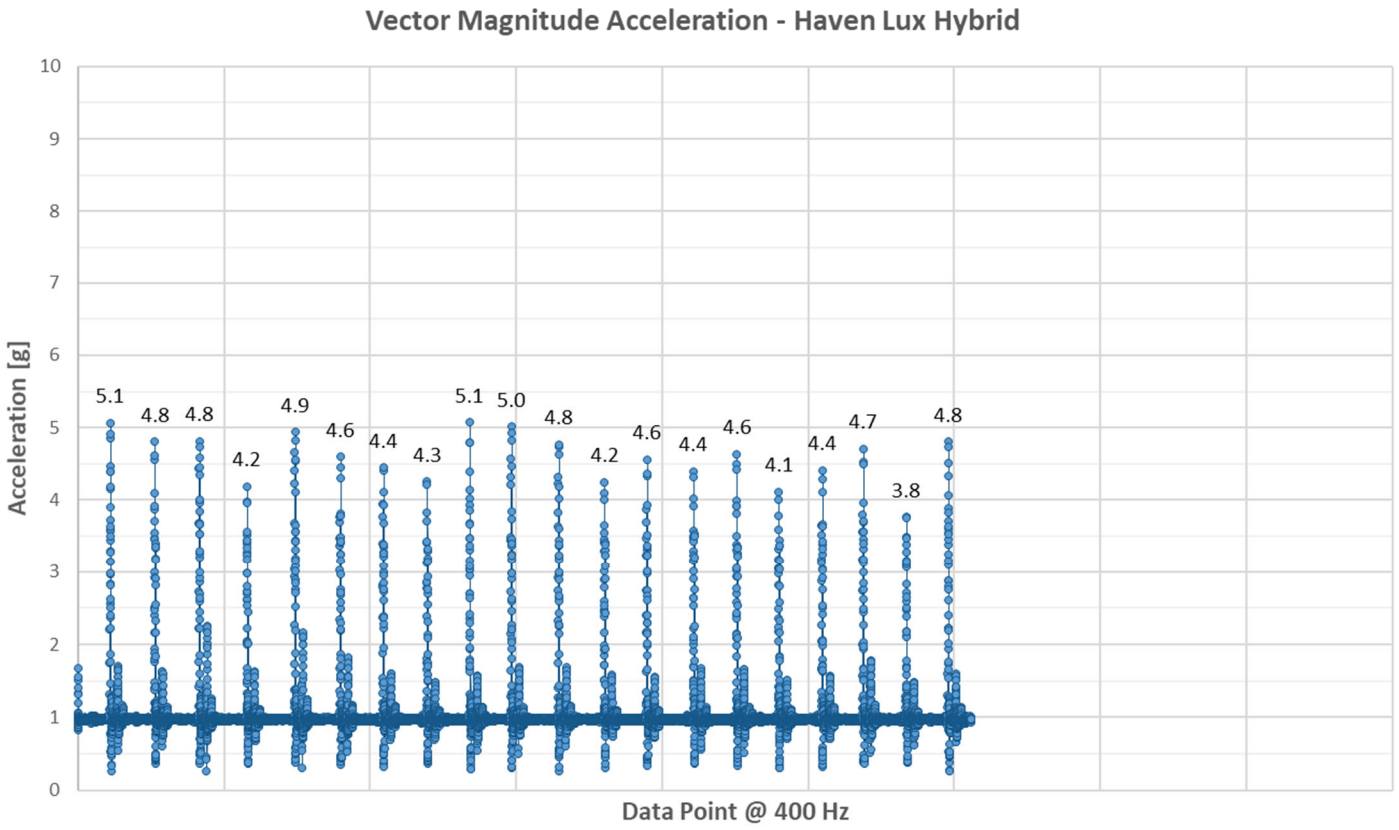


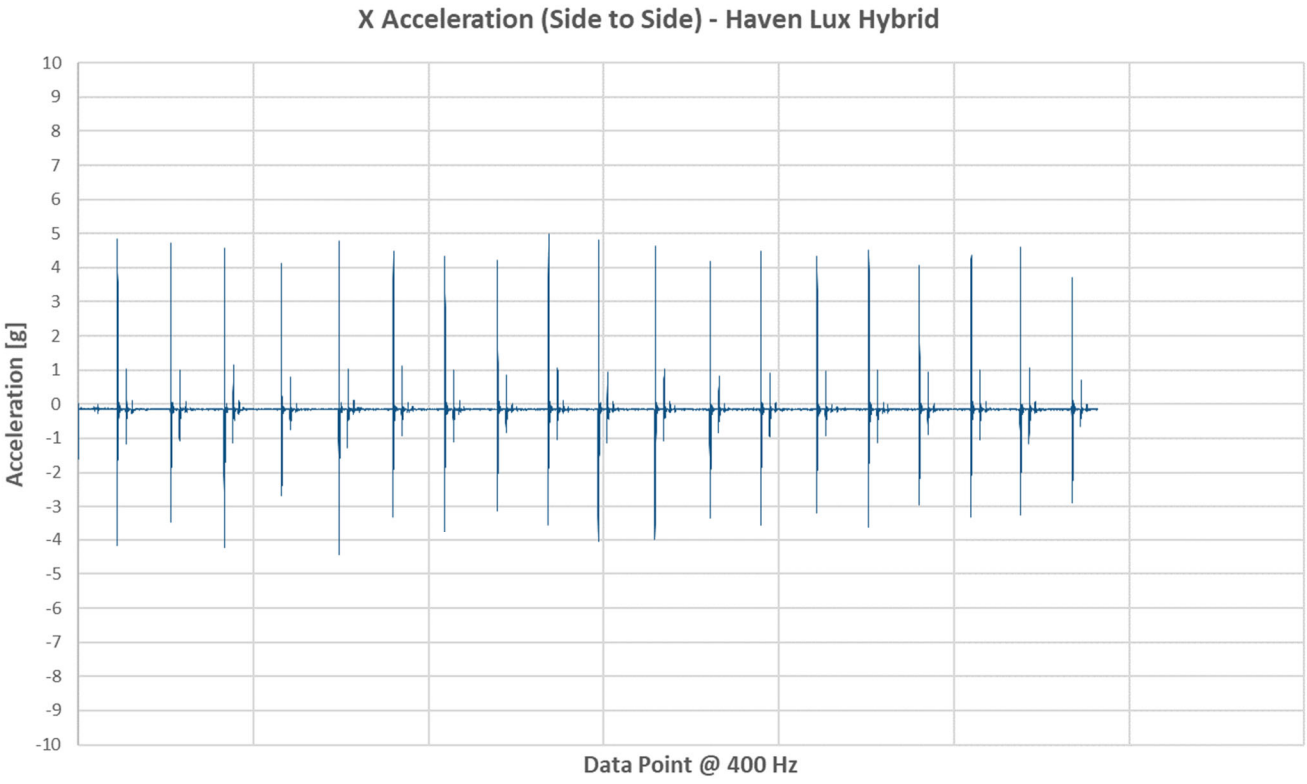


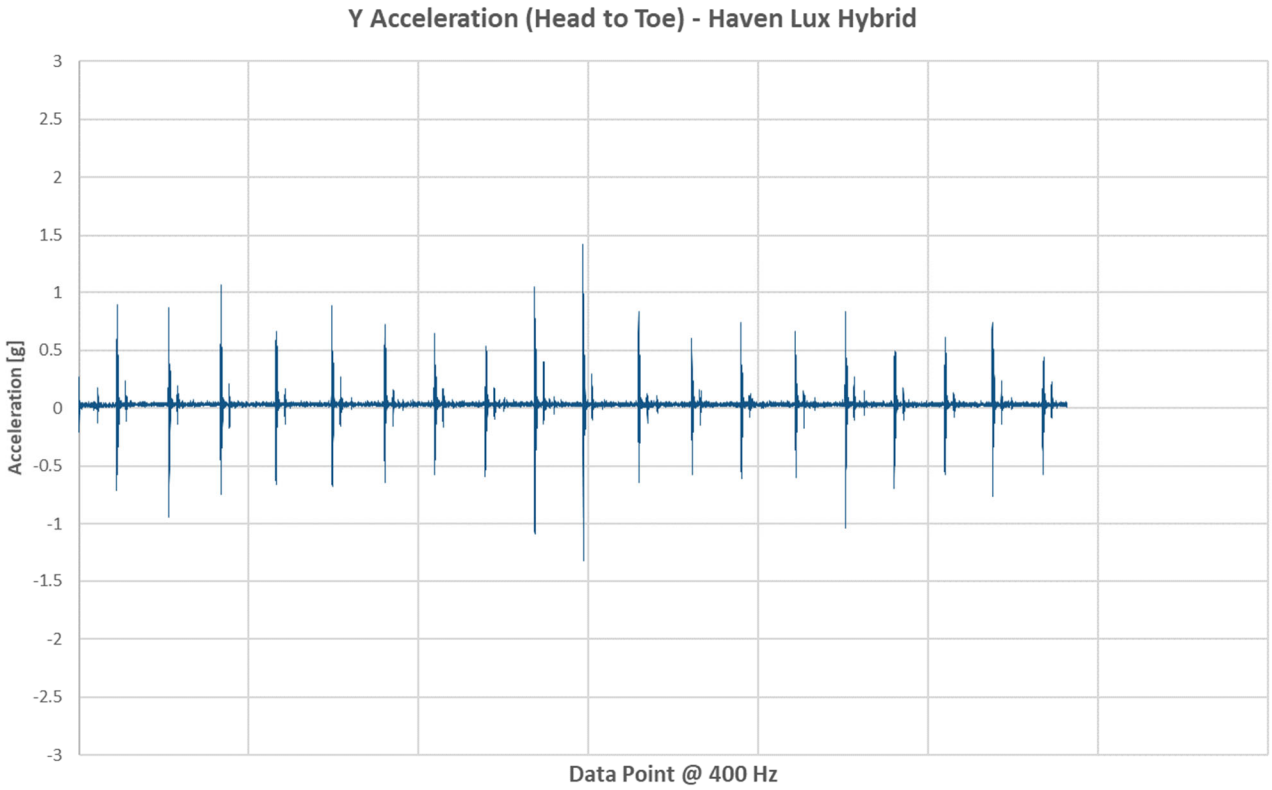

Y Acceleration (Head to Toe) - Sealy Cocoon
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

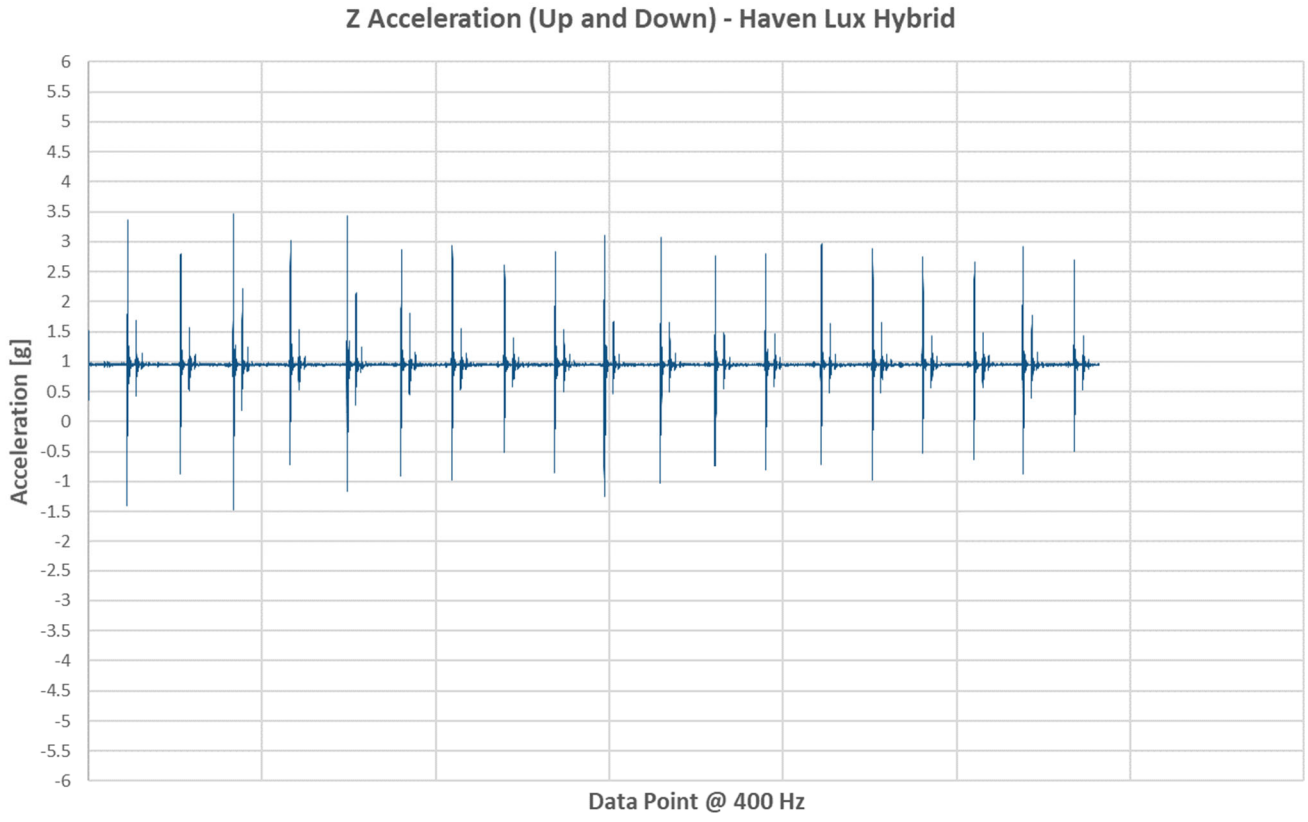

Z Acceleration (Up and Down) - Sealy Cocoon
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – HAVEN LUX HYBRID

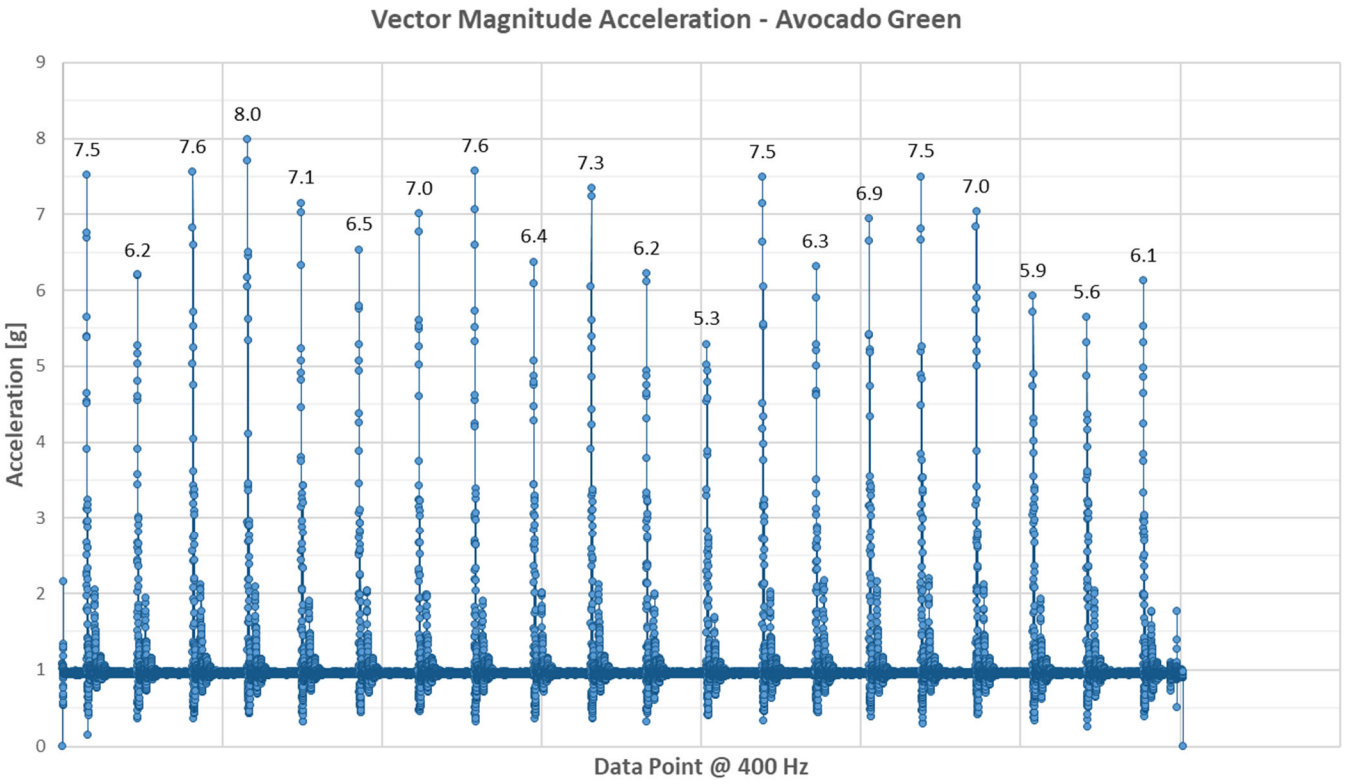


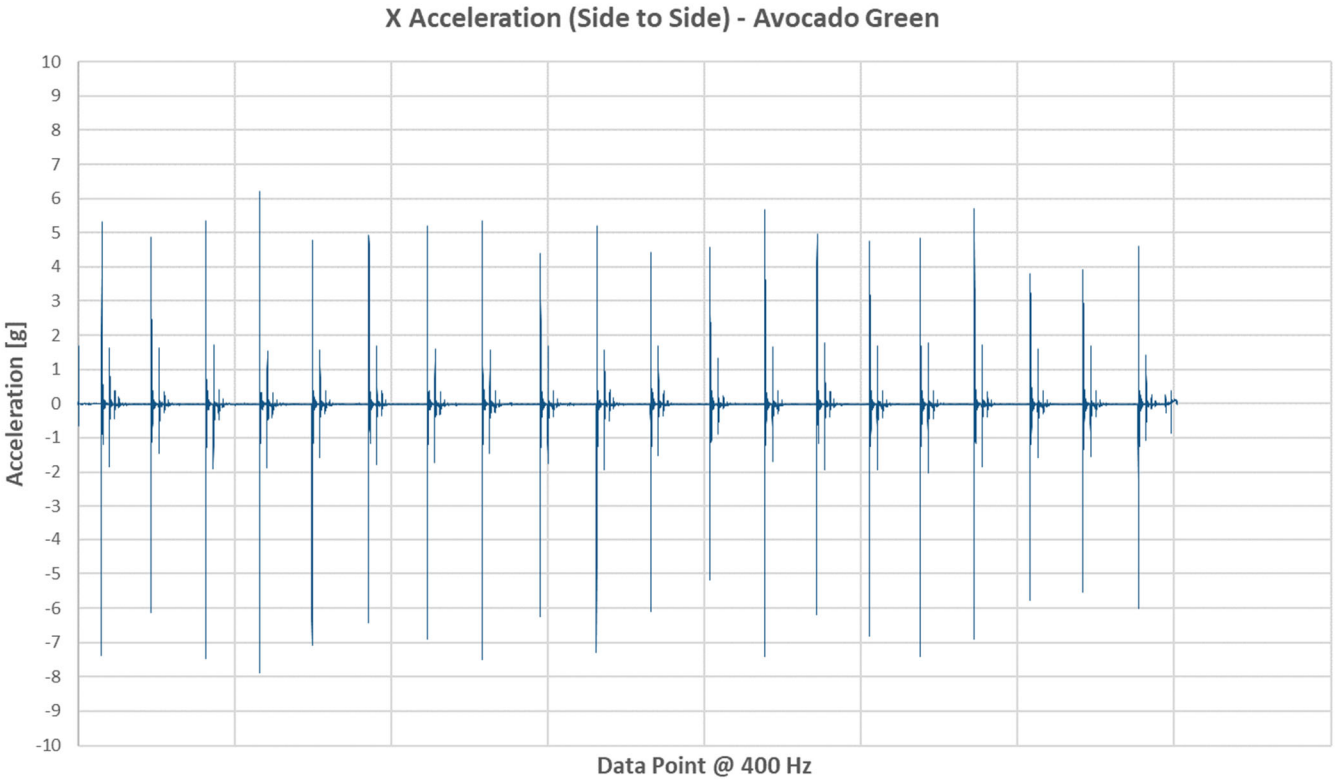


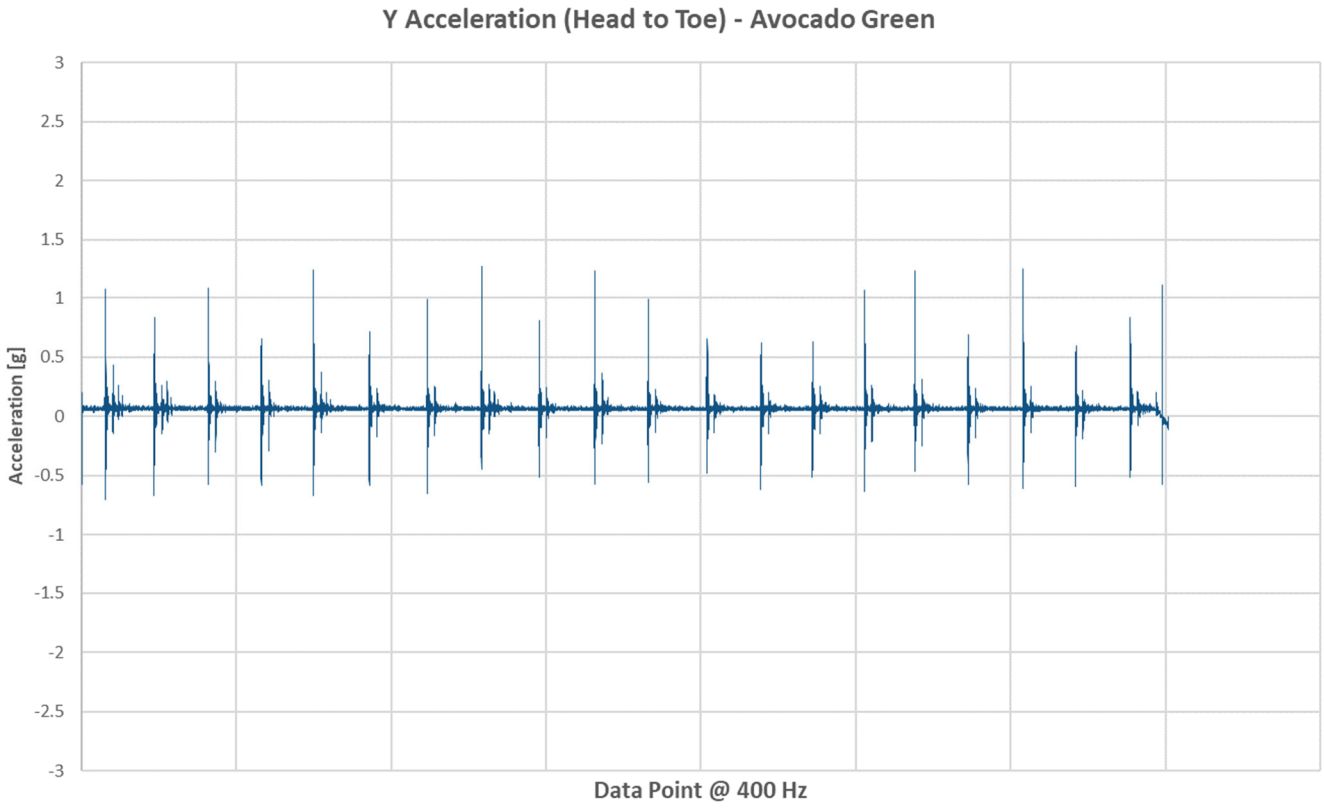

Y Acceleration (Head to Toe) - Haven Lux Hybrid
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

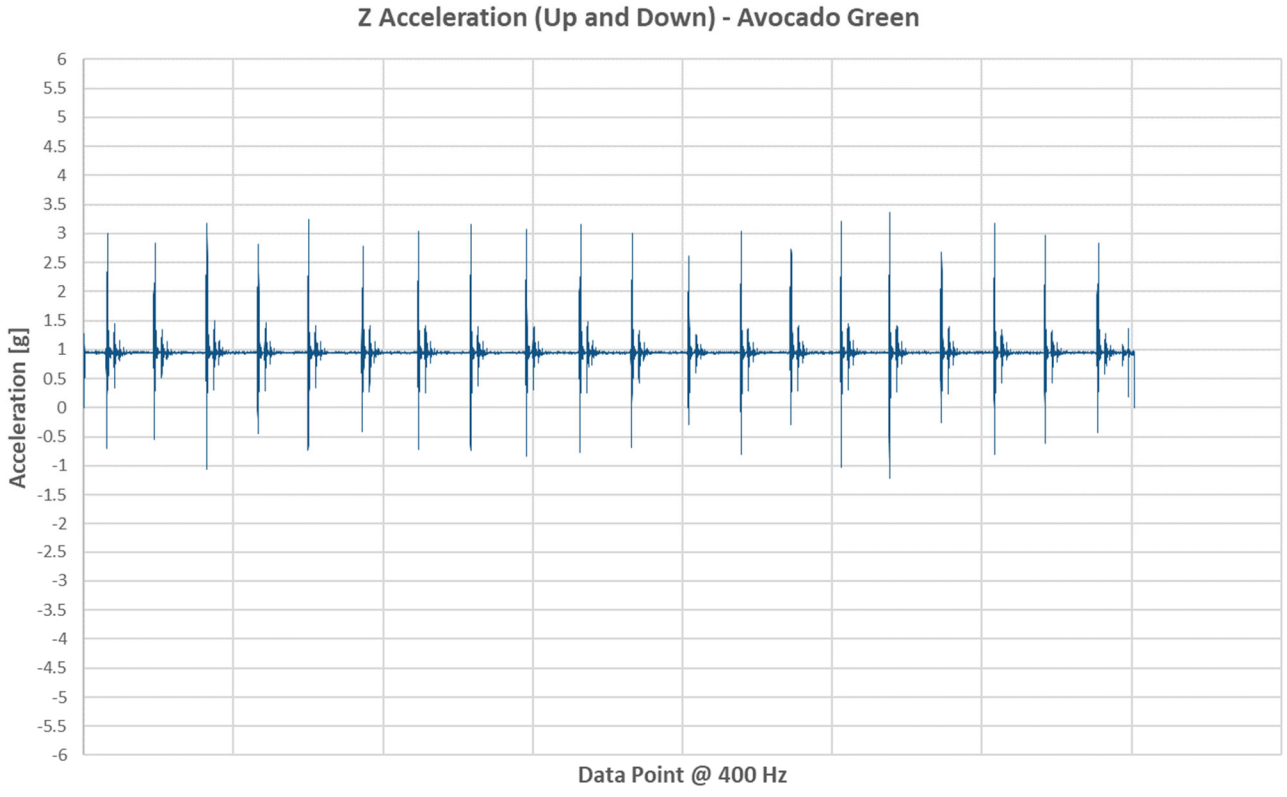

Z Acceleration (Up and Down) - Haven Lux Hybrid
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – AVACADO GREEN

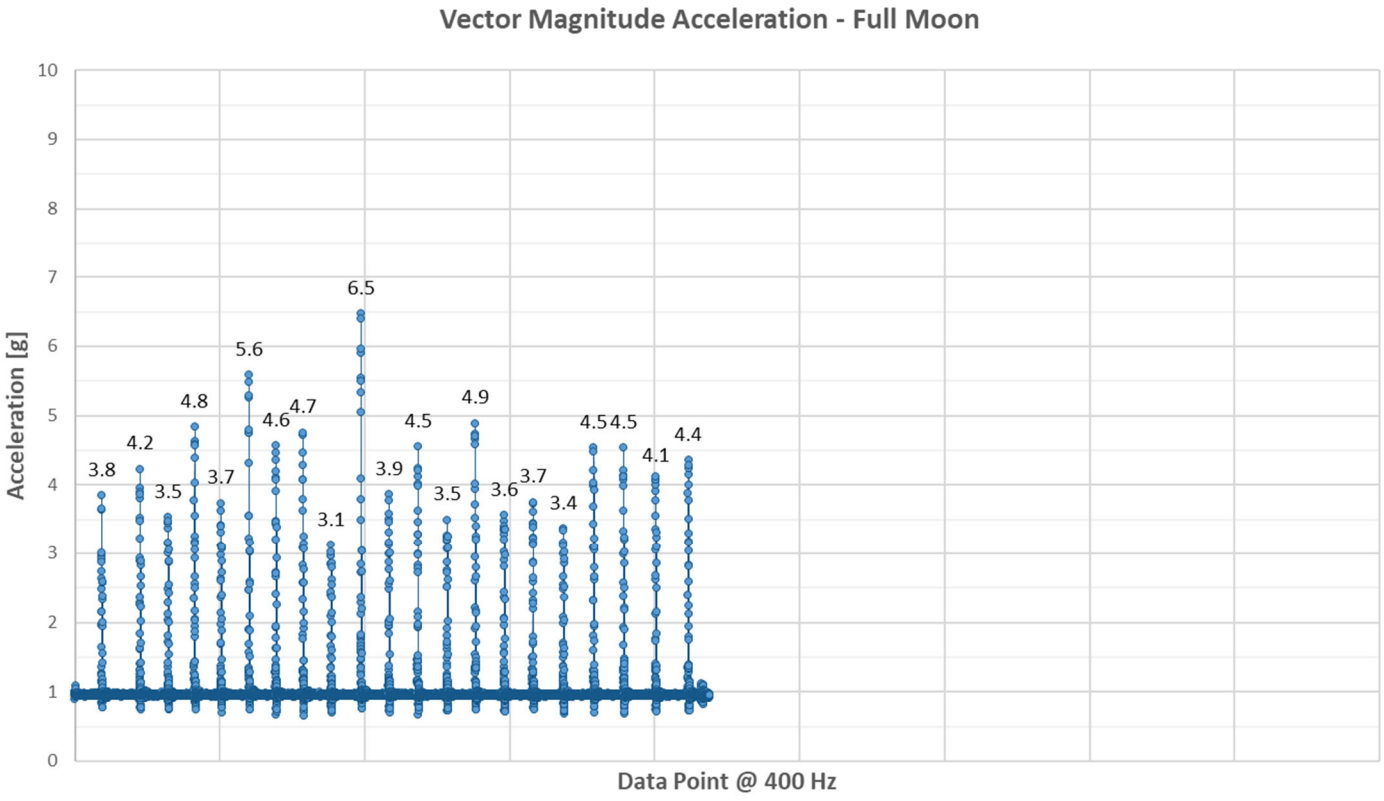


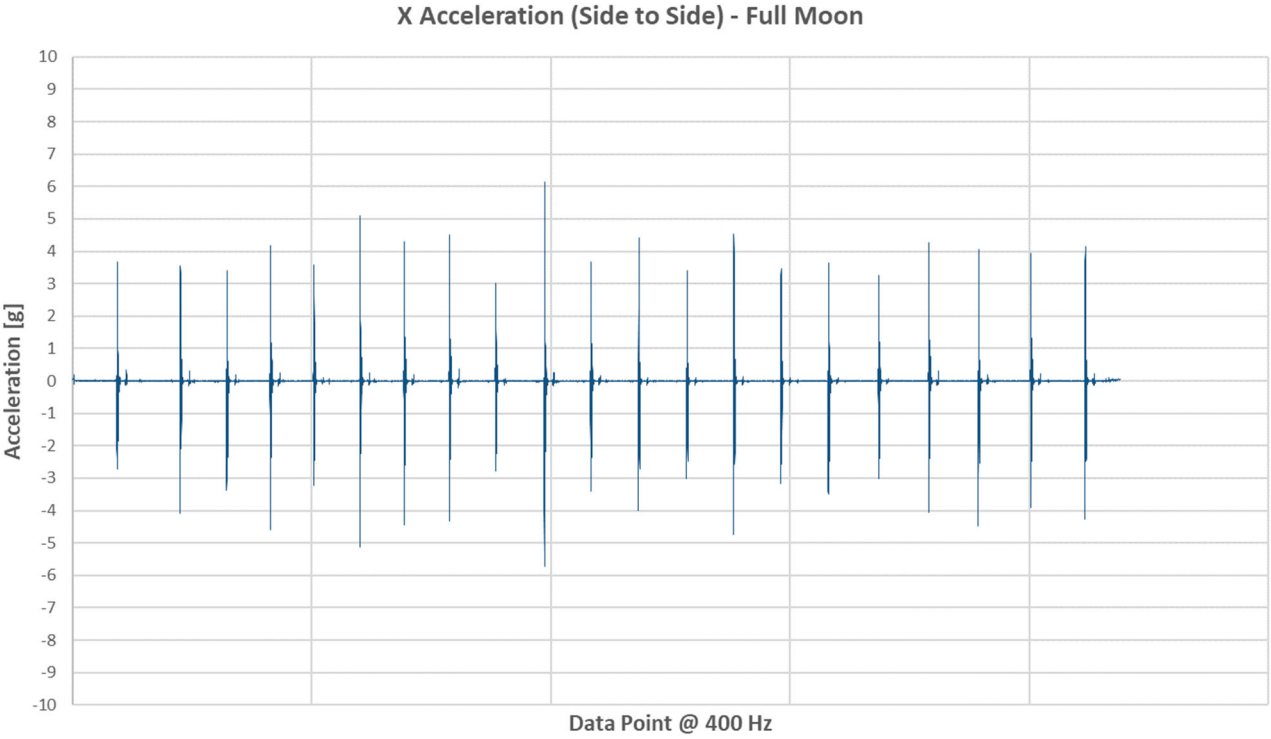


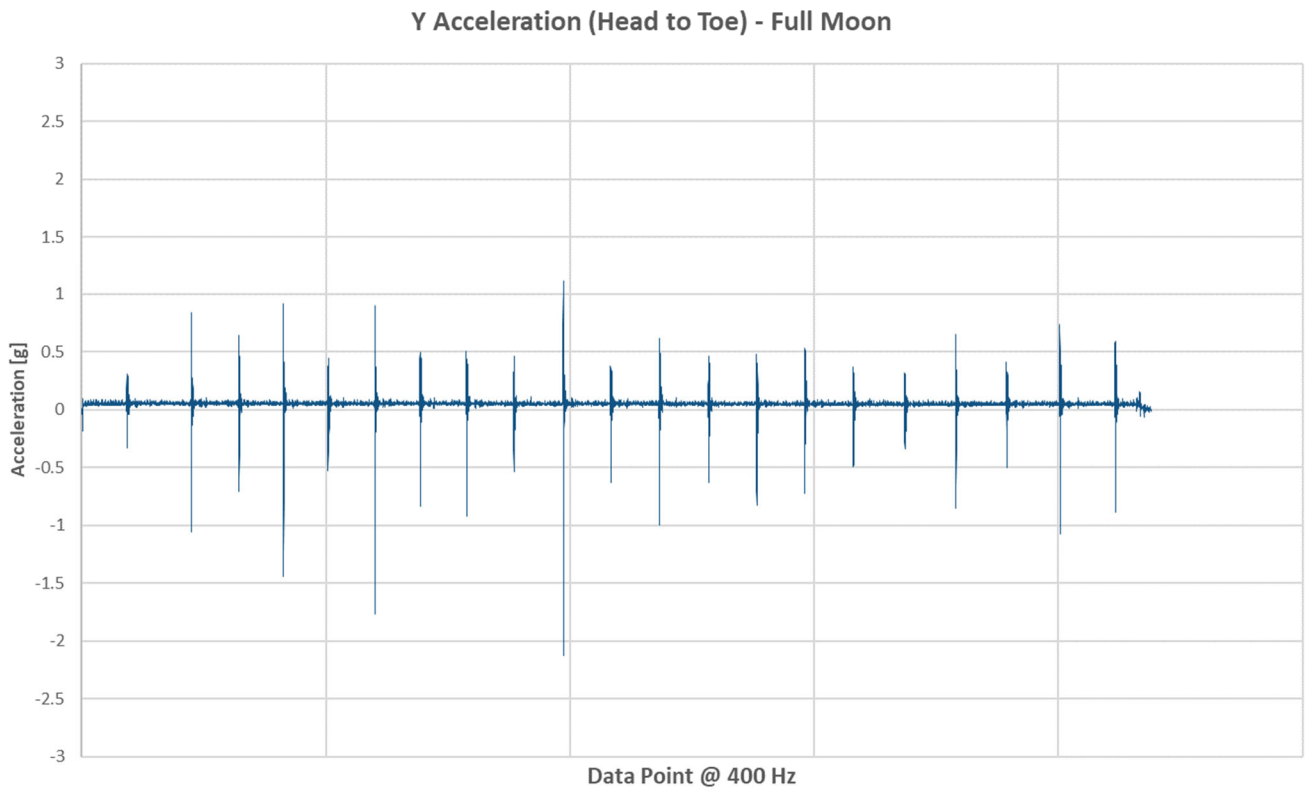

Y Acceleration (Head to Toe) - Avocado Green
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

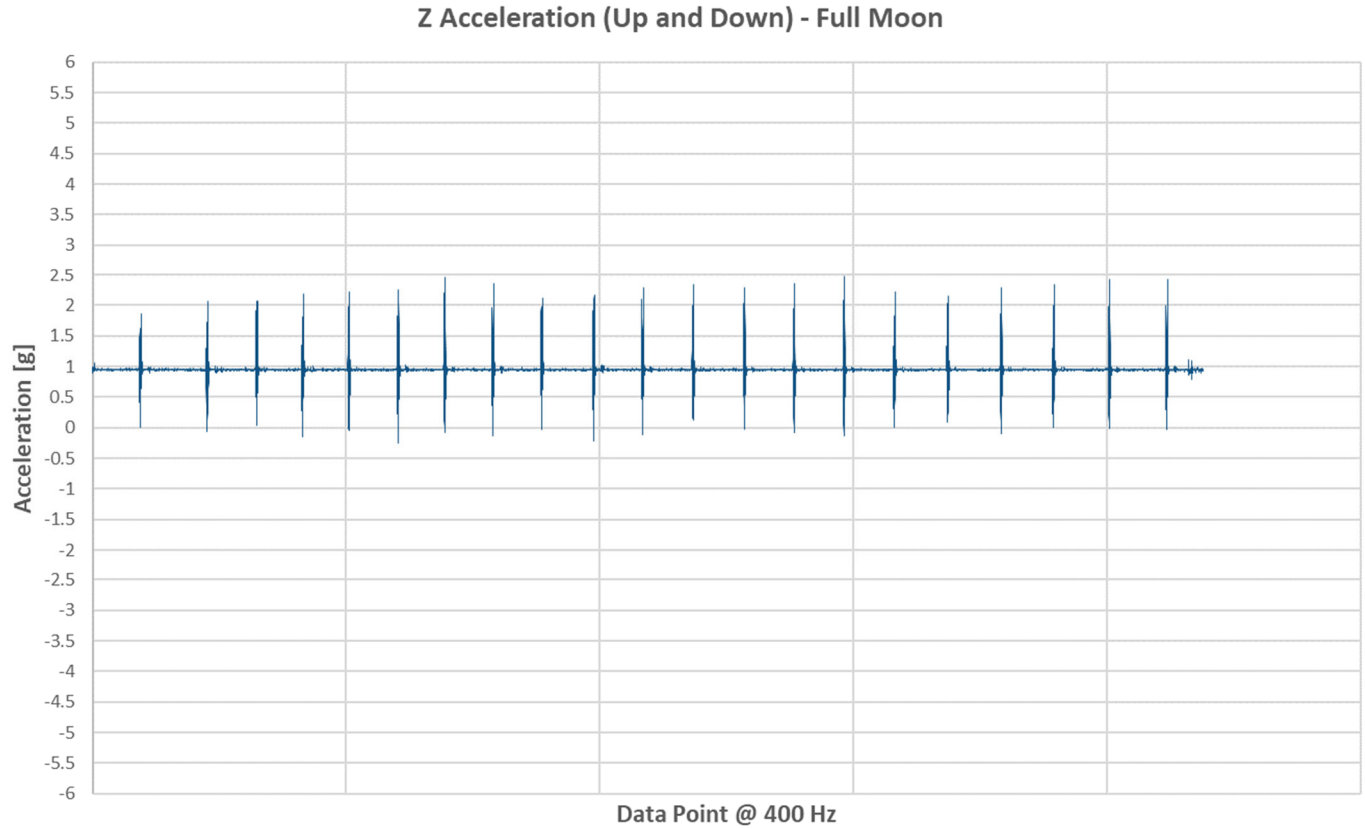

Z Acceleration (Up and Down) - Avocado Green
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – FULL MOON

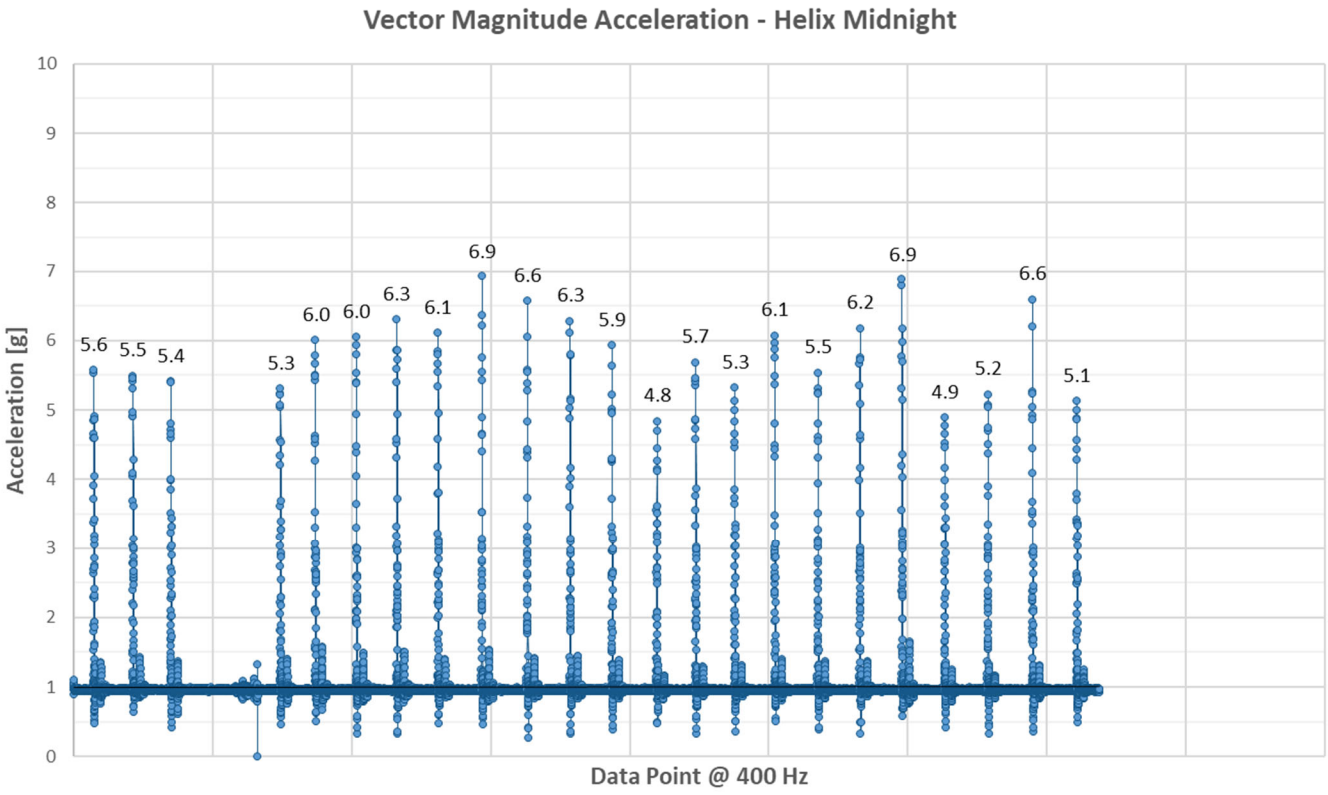


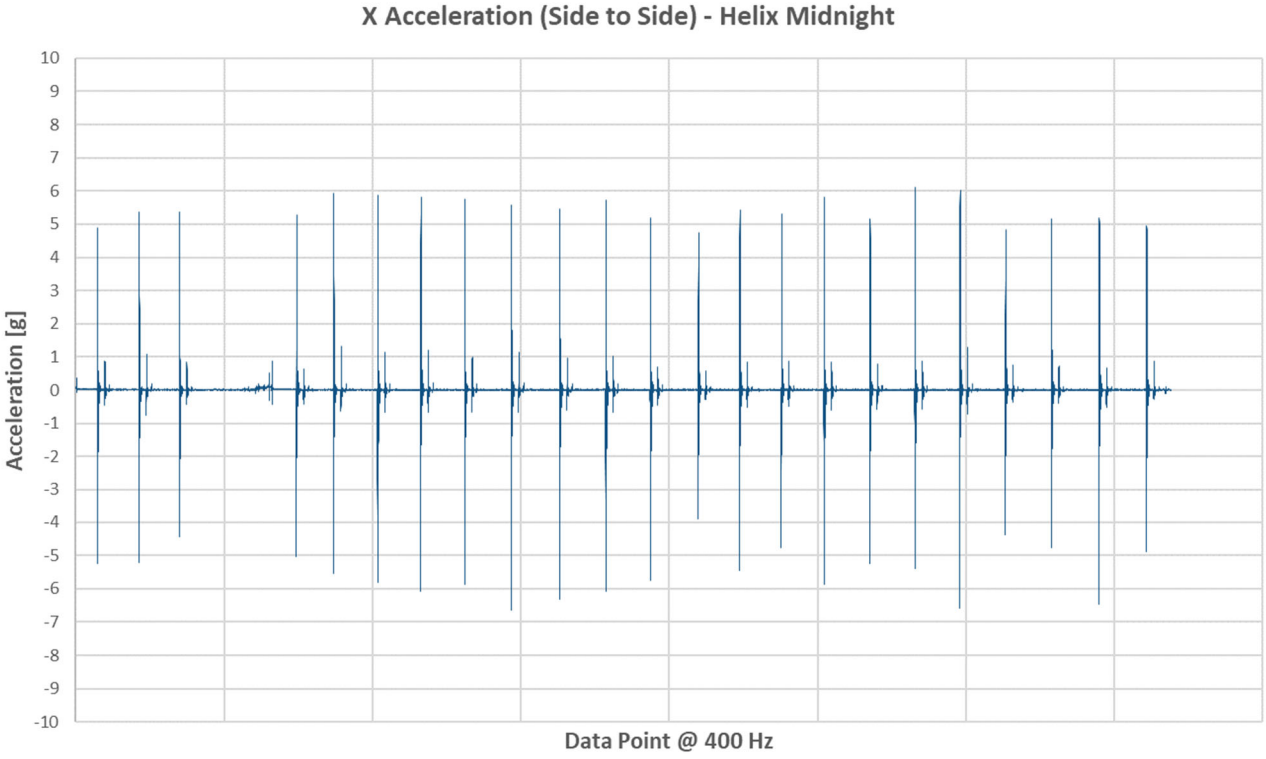


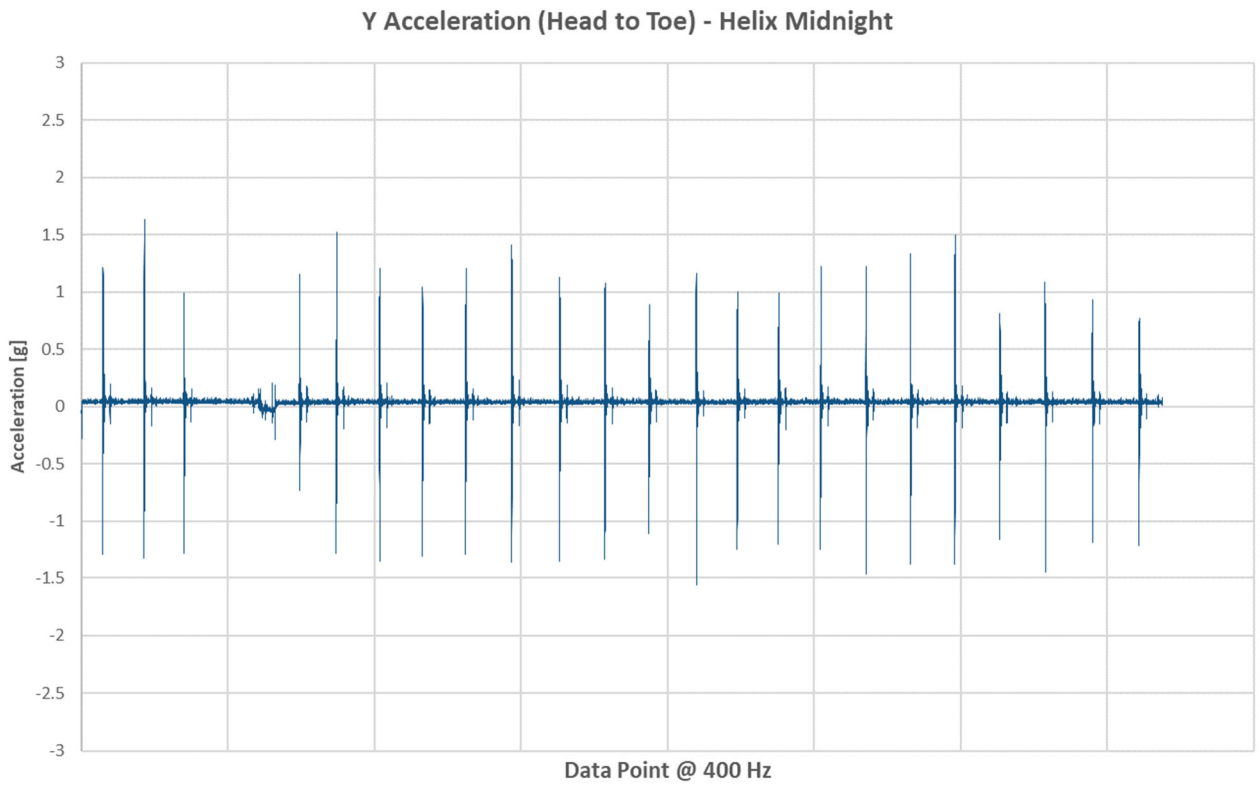

Y Acceleration (Head to Toe) - Full Moon
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

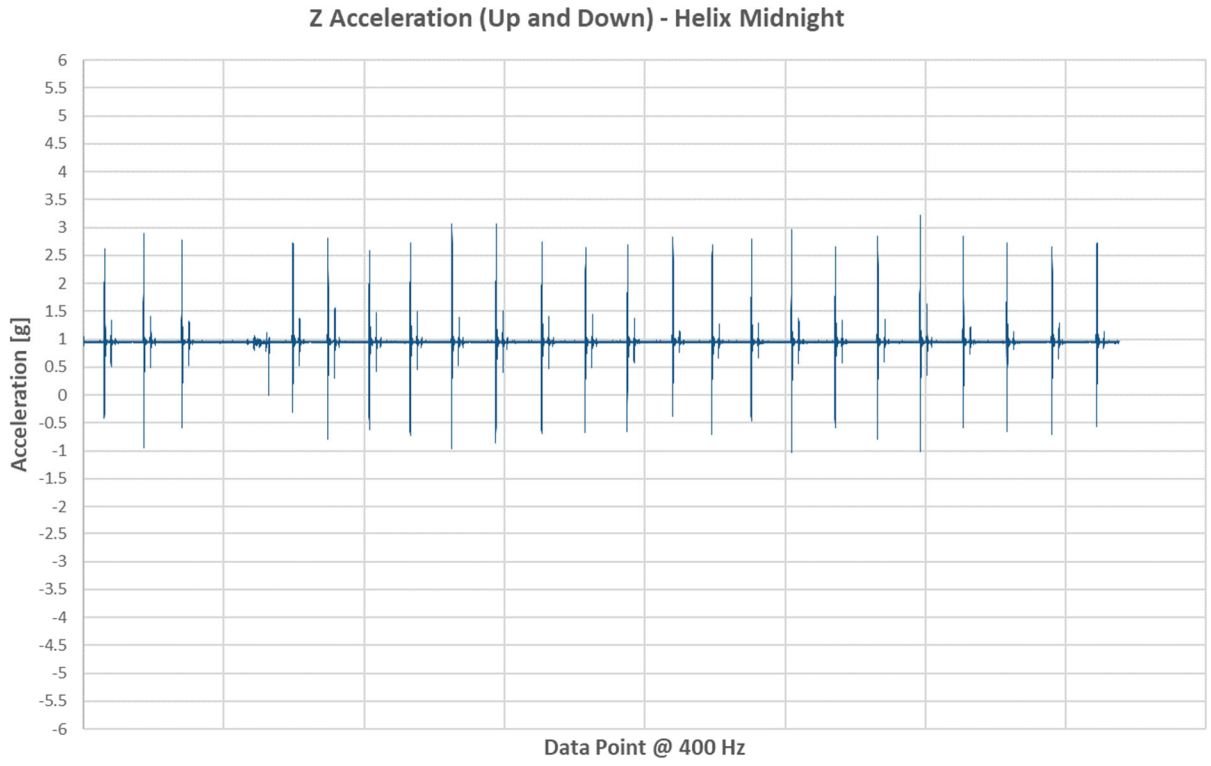

Z Acceleration (Up and Down) - Full Moon
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – HELIX MIDNIGHT

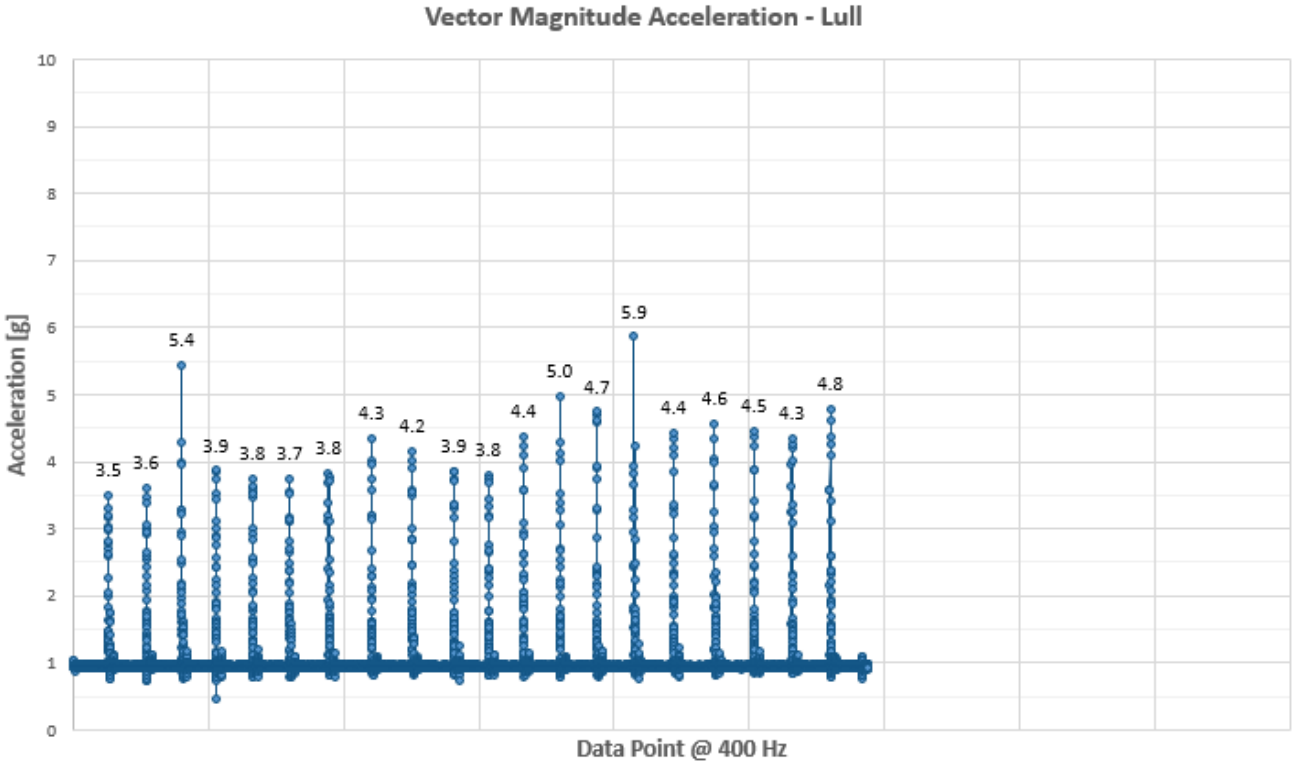


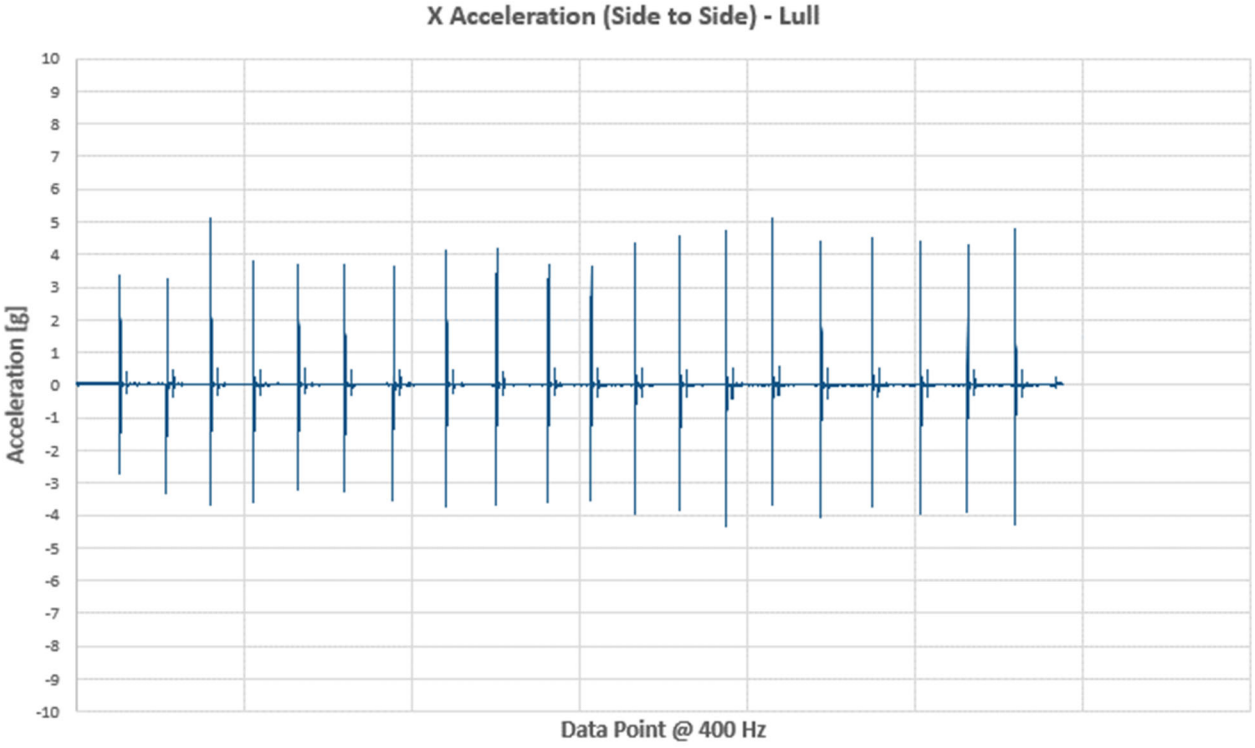


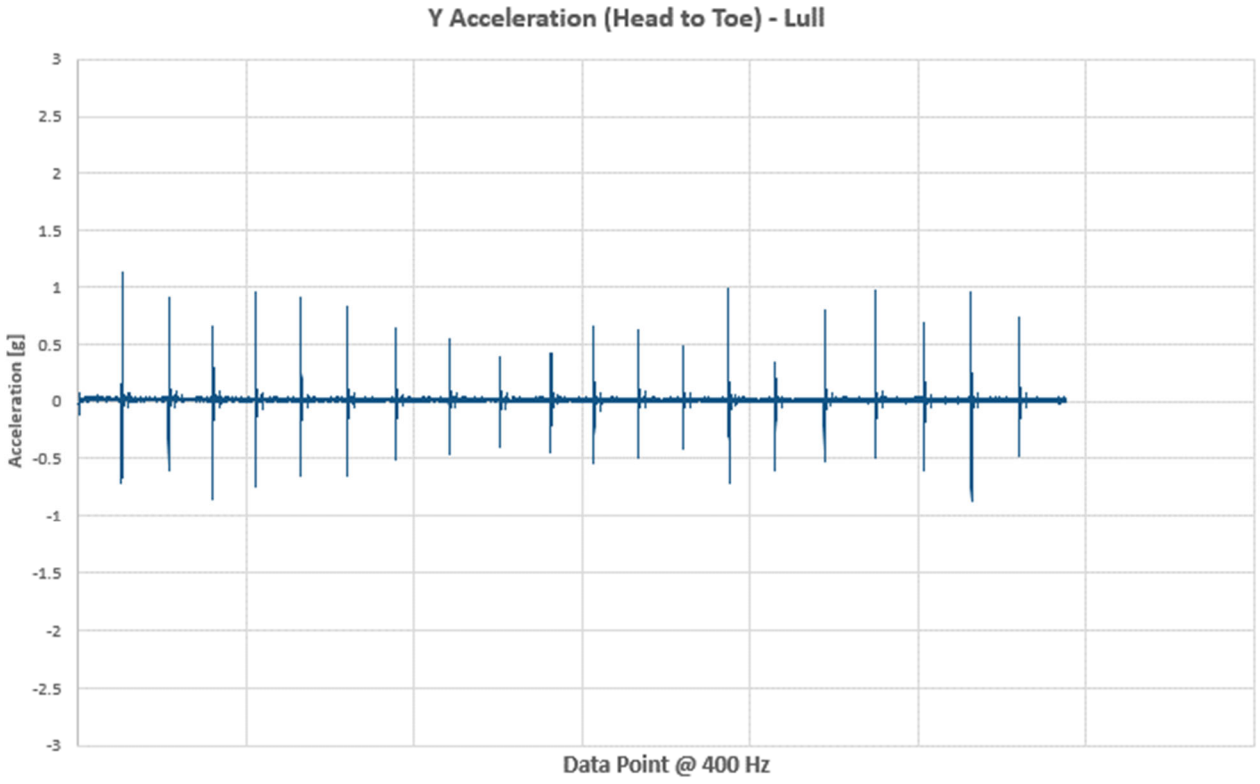

Y Acceleration (Head to Toe) - Helix Midnight
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

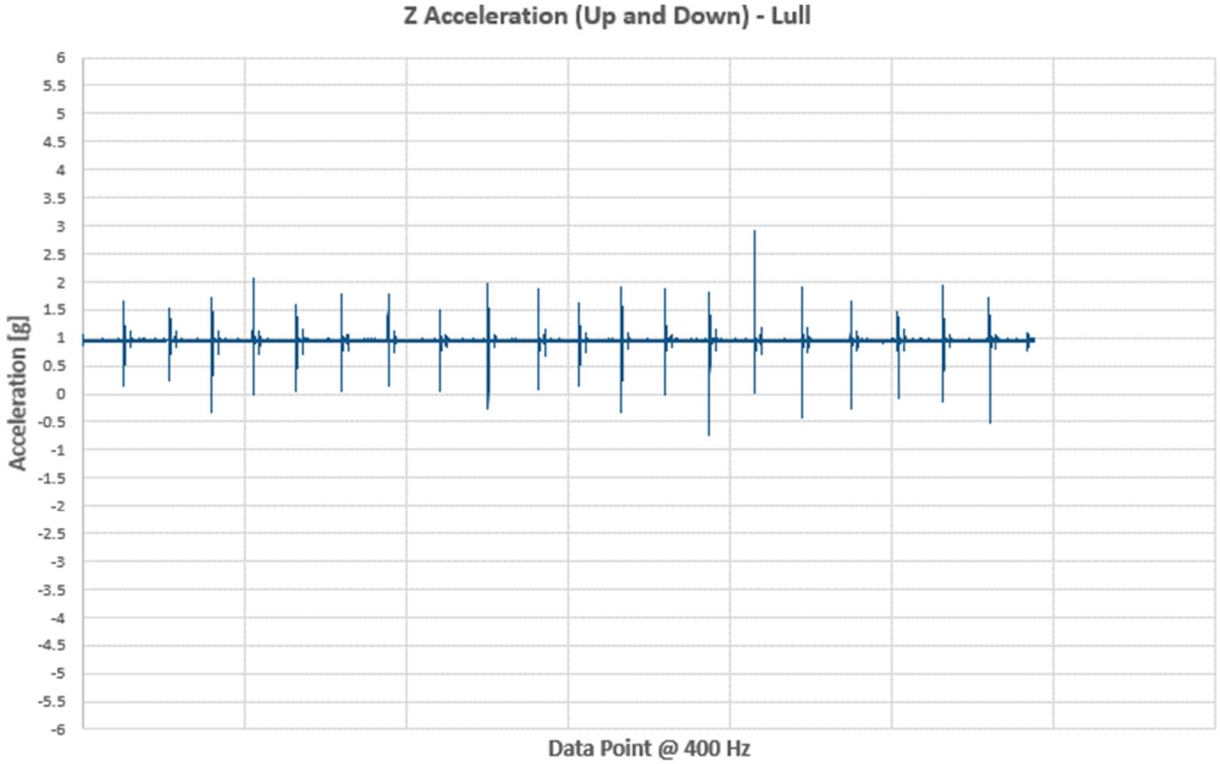

Z Acceleration (Up and Down) - Helix Midnight
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – LULL

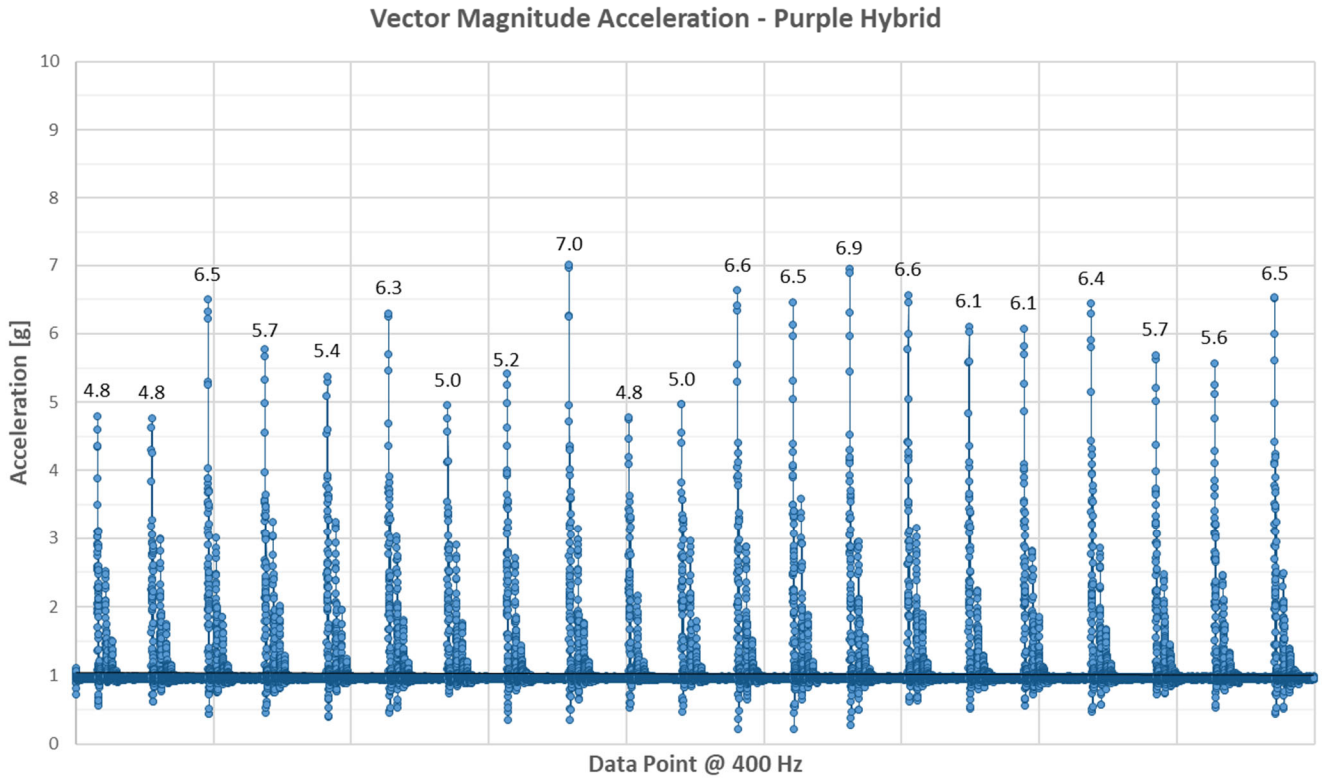

Vector Magnitude Acceleration - Lull
Acceleration [g]
Data Point @ 400 Hz
3.5
3.6
5.4
3.9
3.8
3.7
3.8
4.3
4.2
3.9
3.8
4.4
5.0
4.7
5.9
4.4
4.6
4.5
4.3
4.8

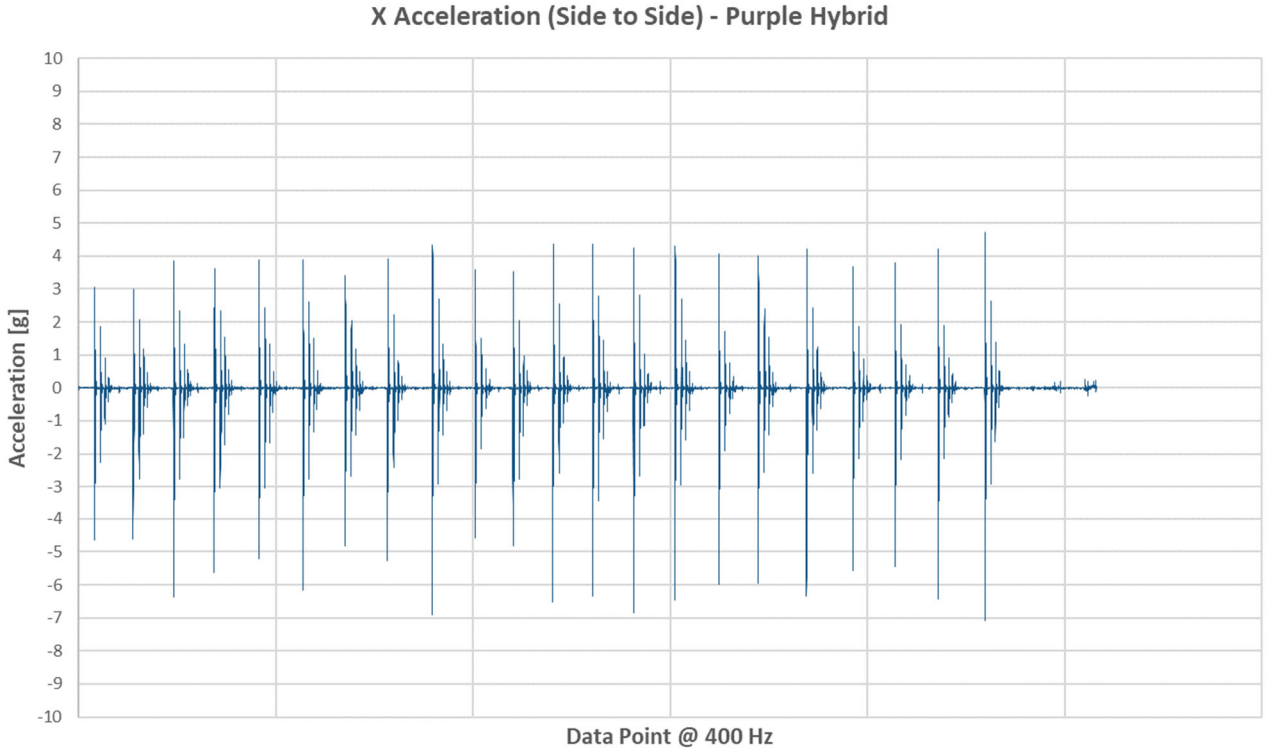

X Acceleration (Side to Side) - Lull
Acceleration [g]
Data Point @ 400 Hz

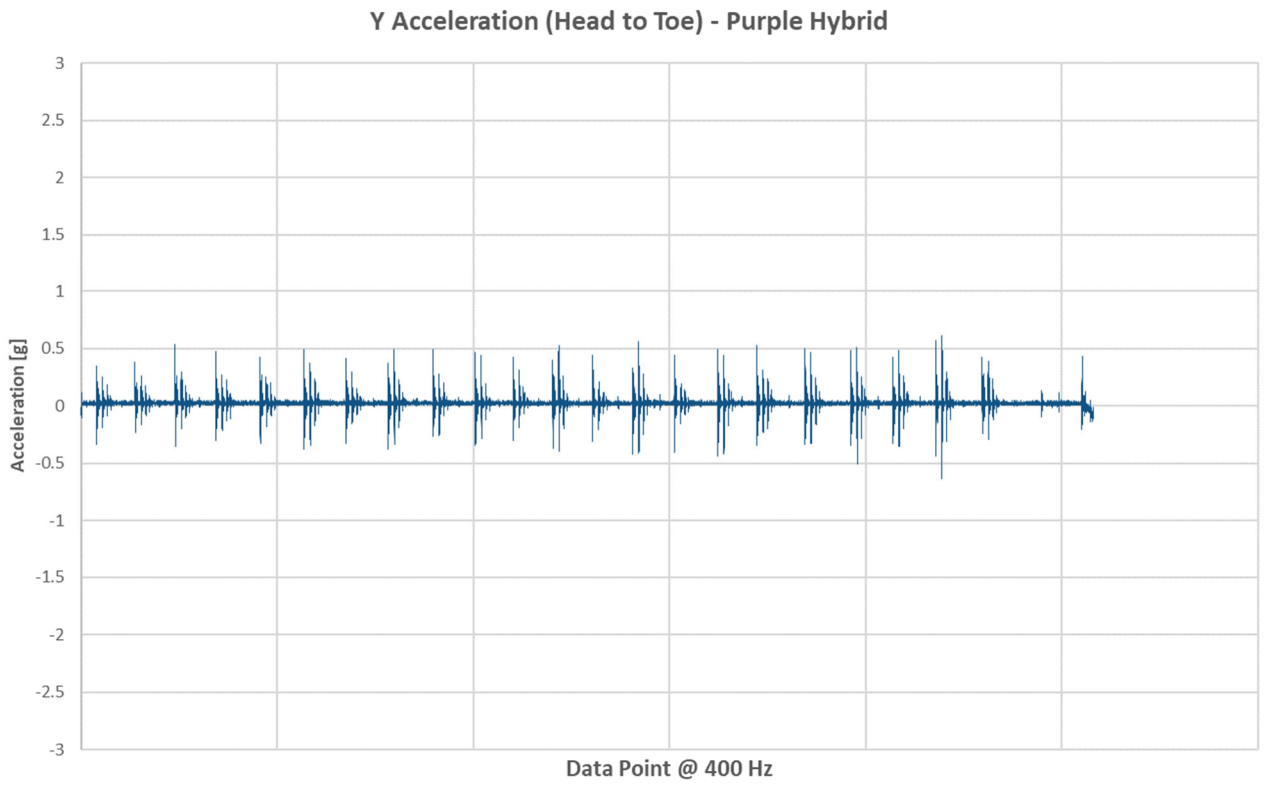

Y Acceleration (Head to Toe) - Lull
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

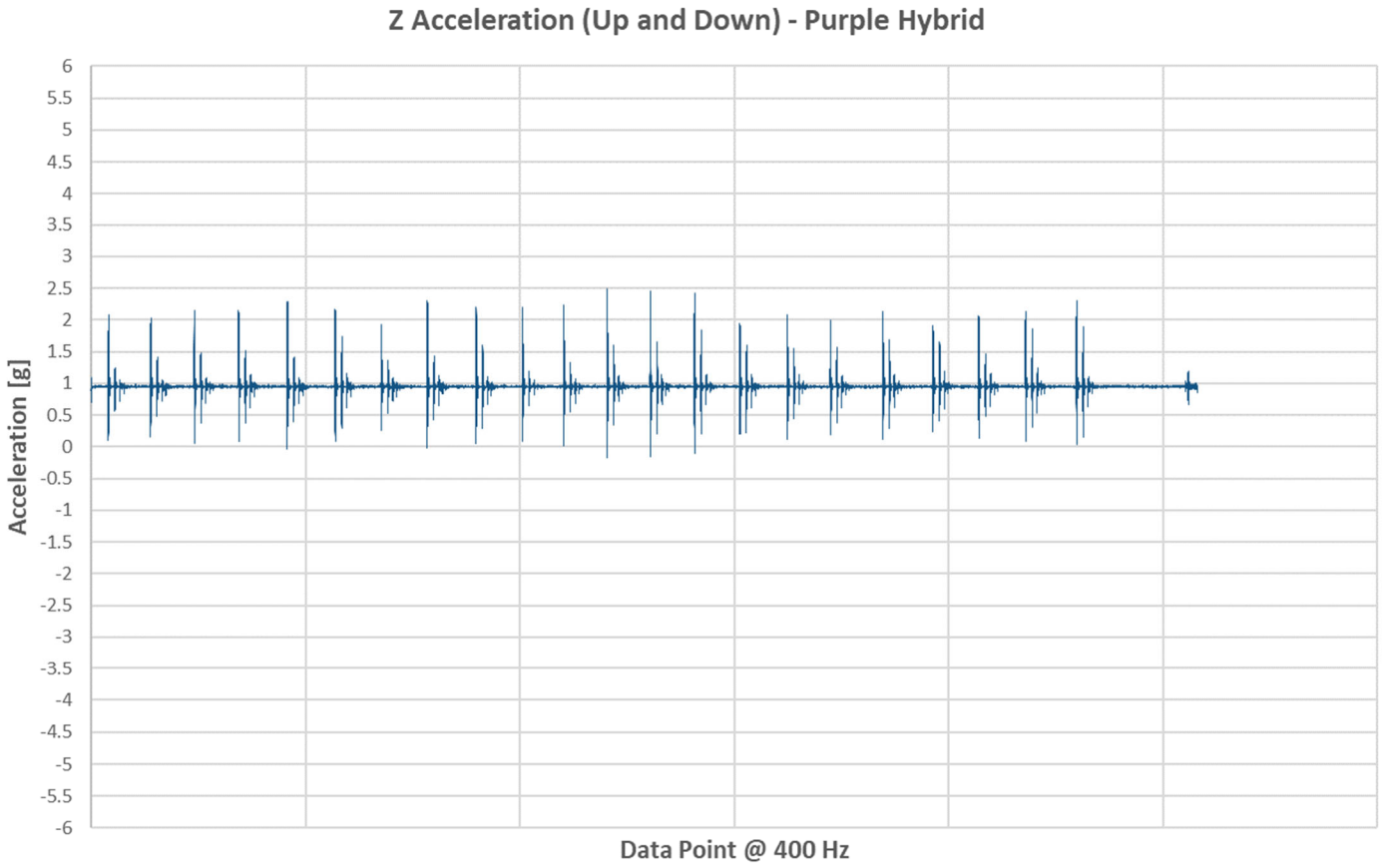

Z Acceleration (Up and Down) - Lull
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – PURPLE HYBRID

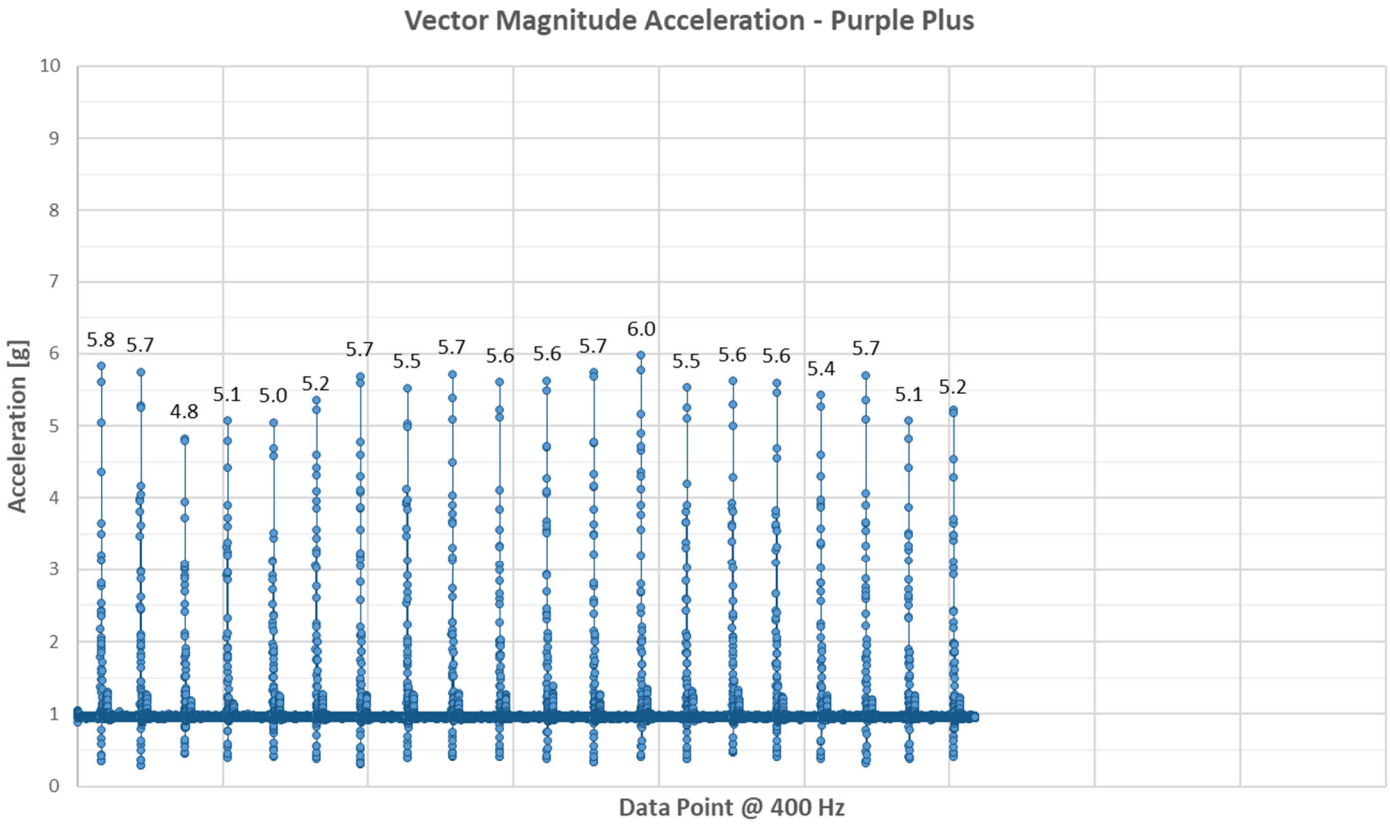


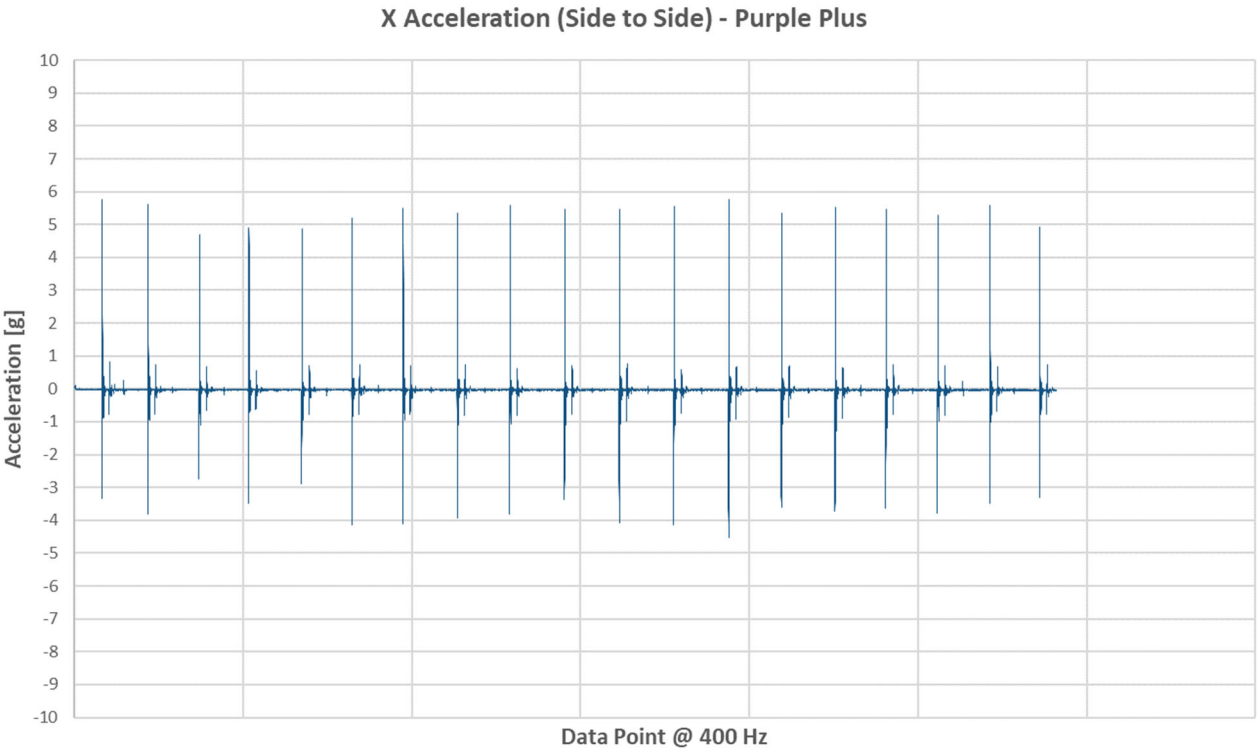


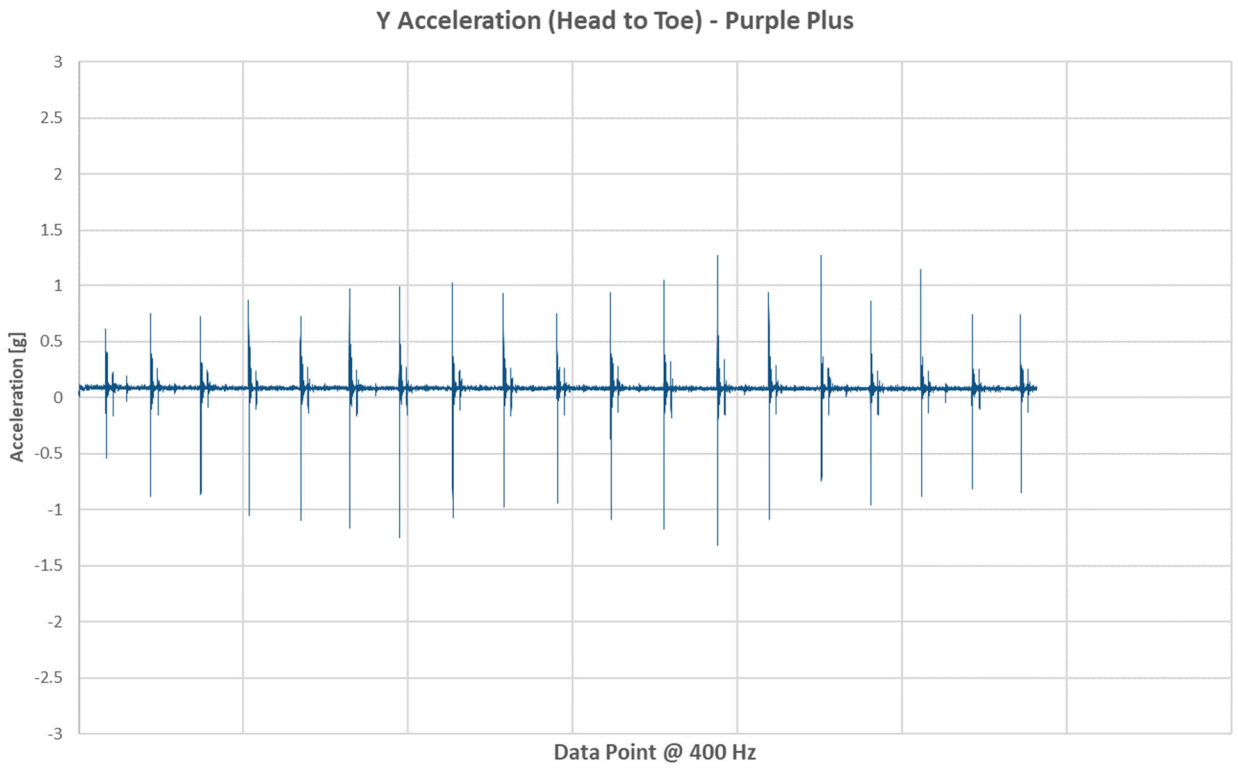

Y Acceleration (Head to Toe) - Purple Hybrid
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

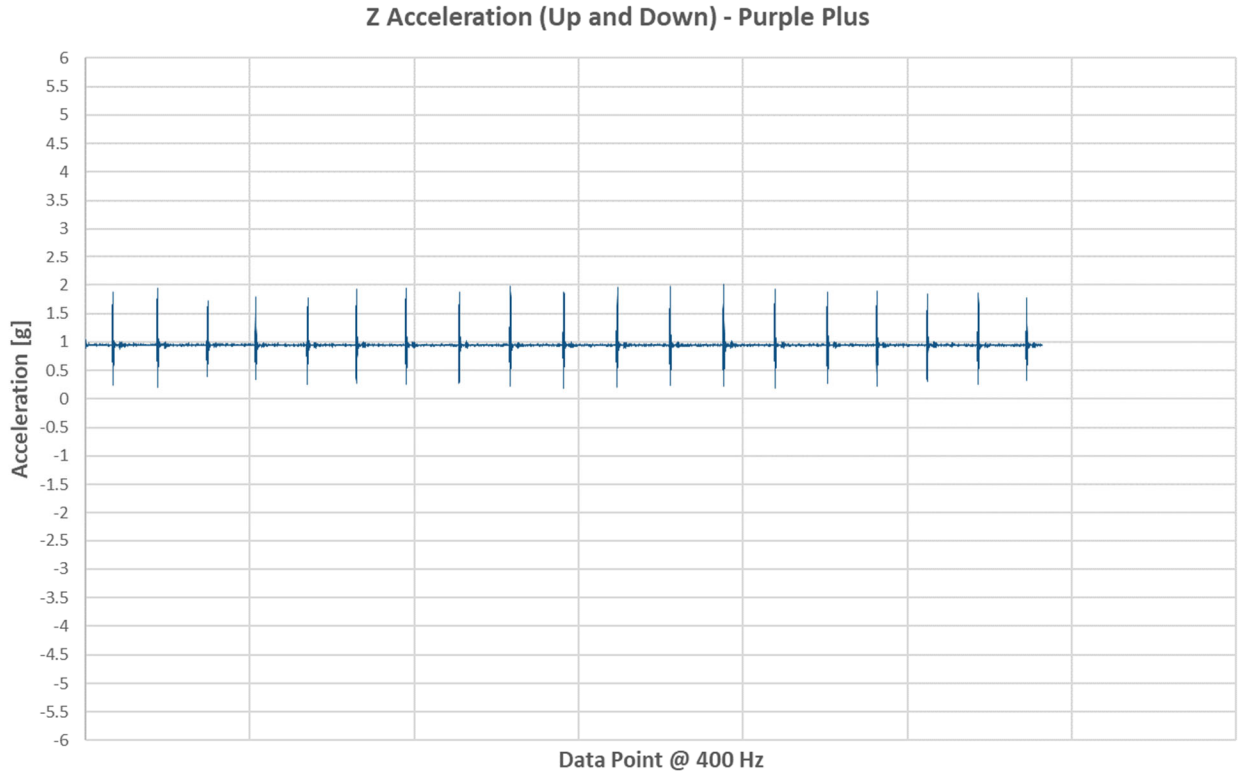

Z Acceleration (Up and Down) - Purple Hybrid
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – PURPLE PLUS

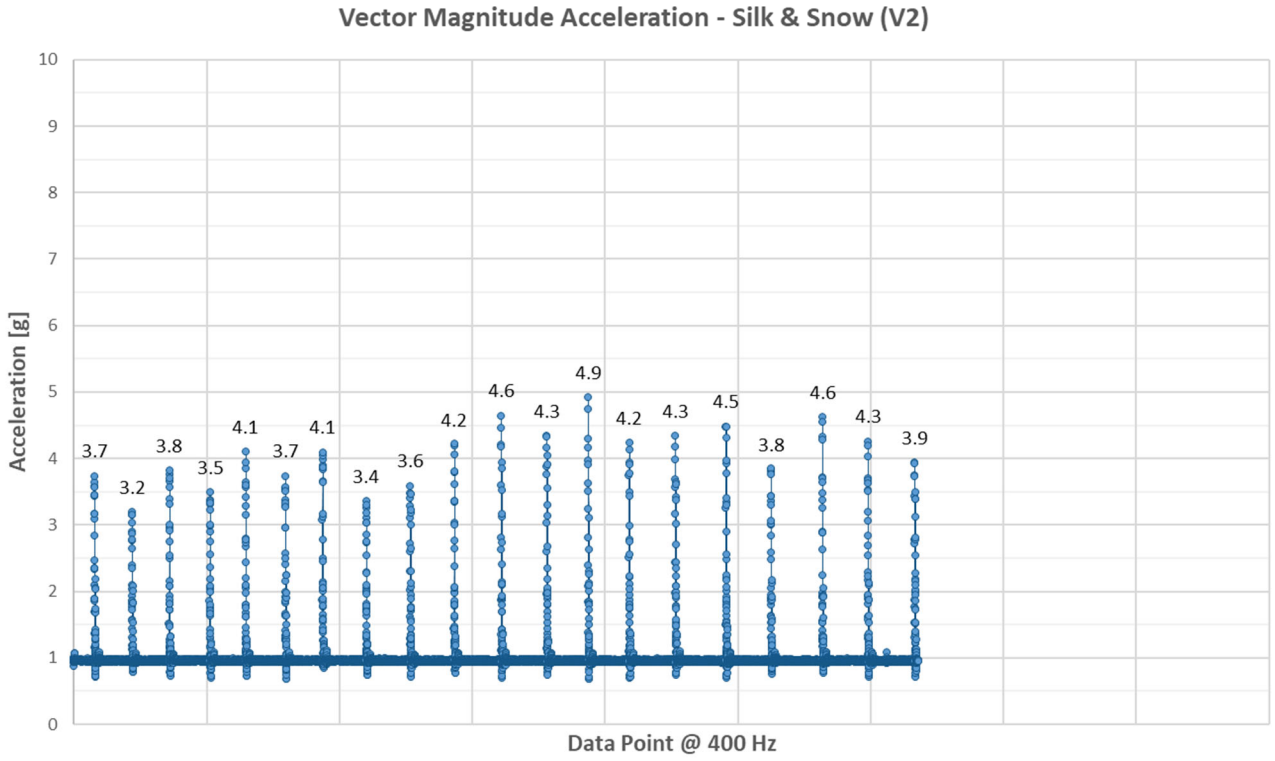


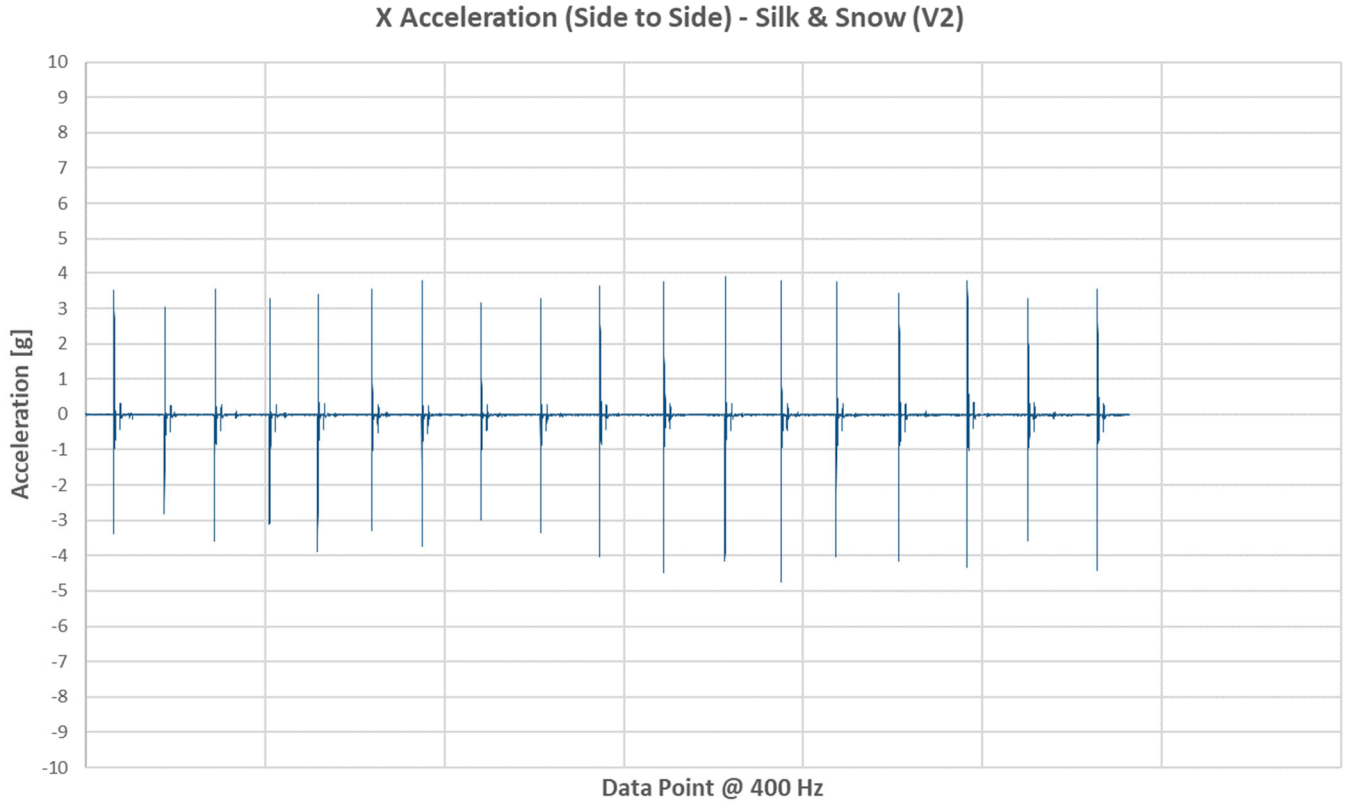


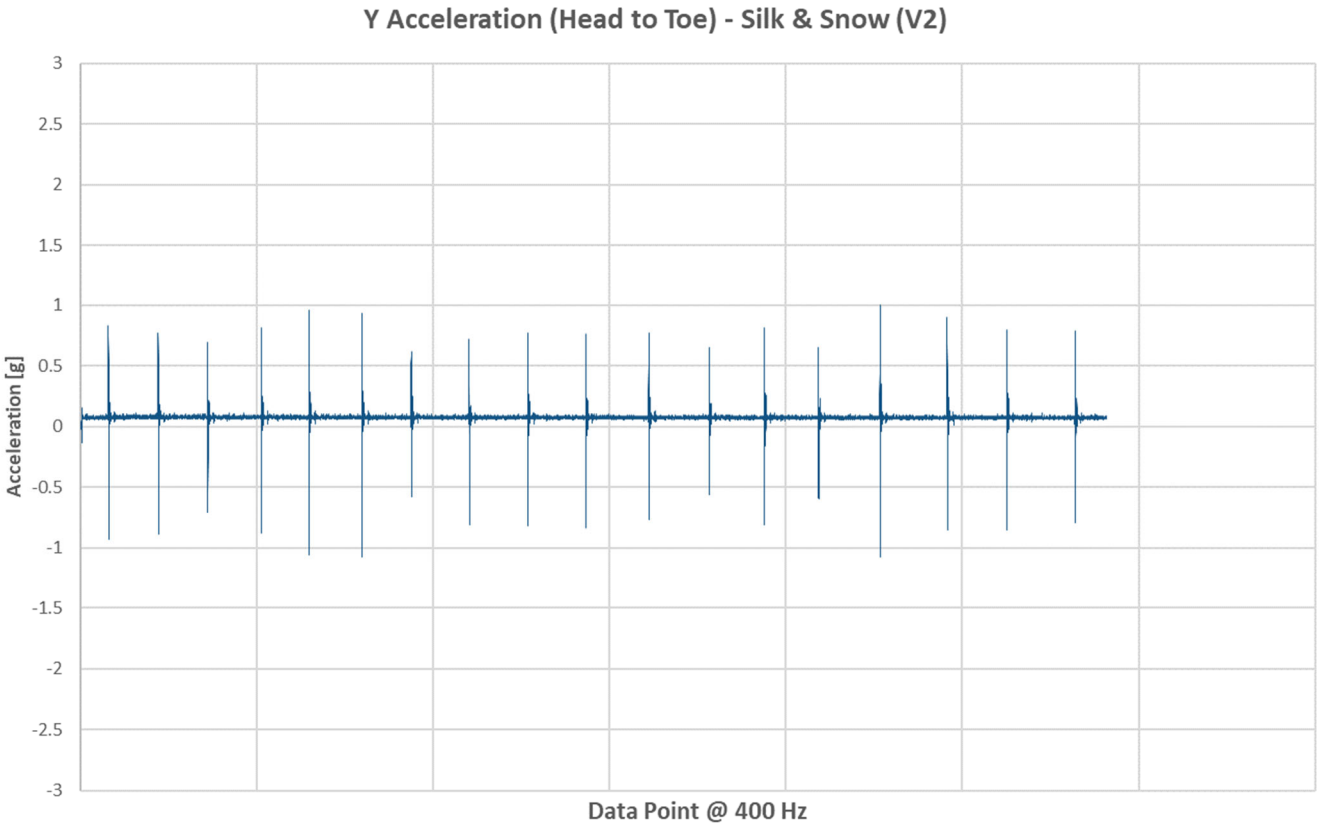

Y Acceleration (Head to Toe) - Purple Plus
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

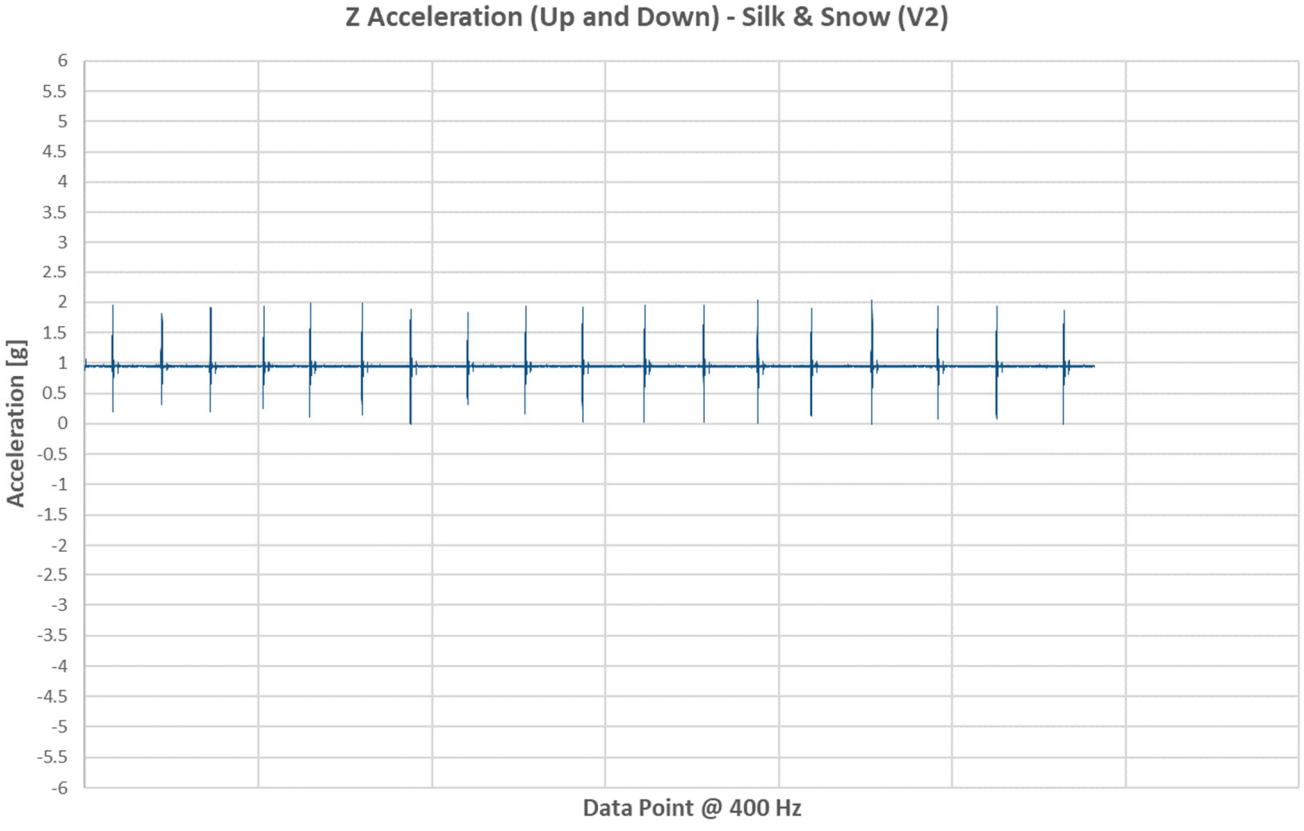

Z Acceleration (Up and Down) - Purple Plus
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – SILK & SNOW (V2)

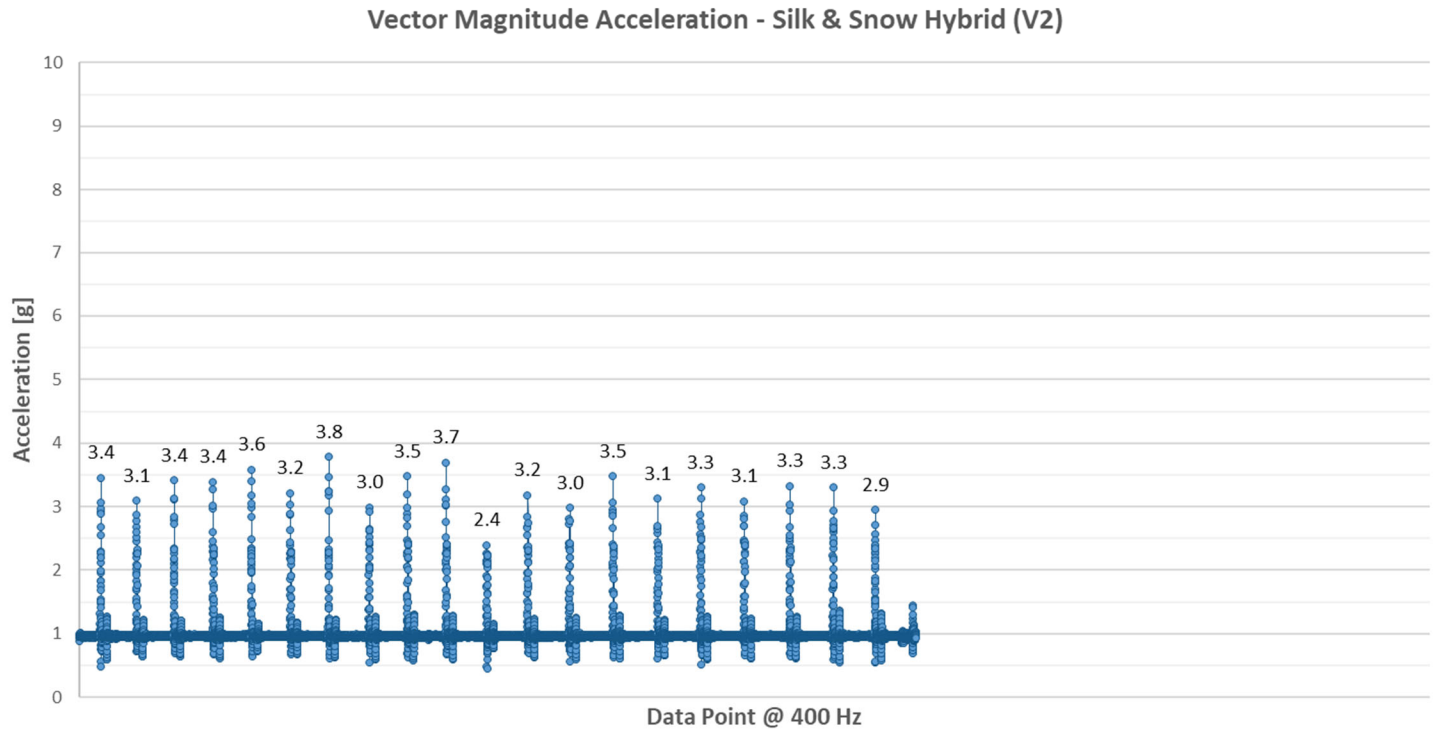


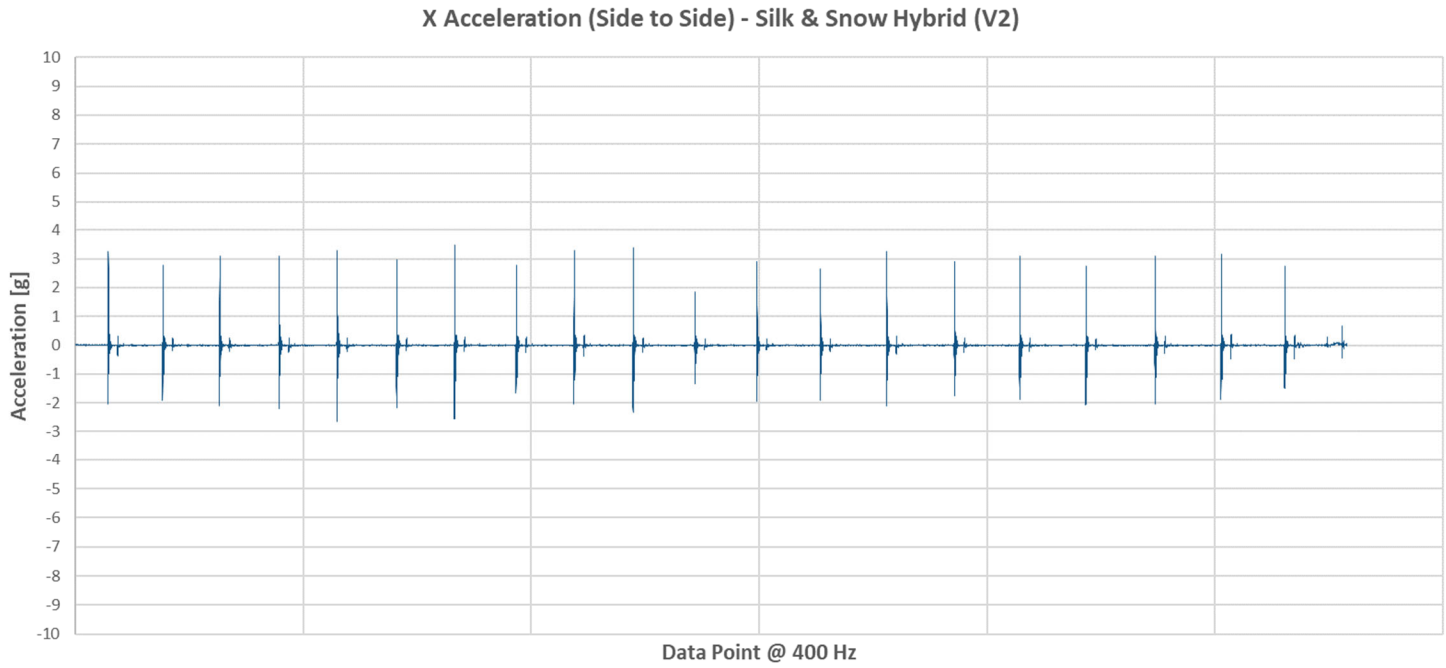


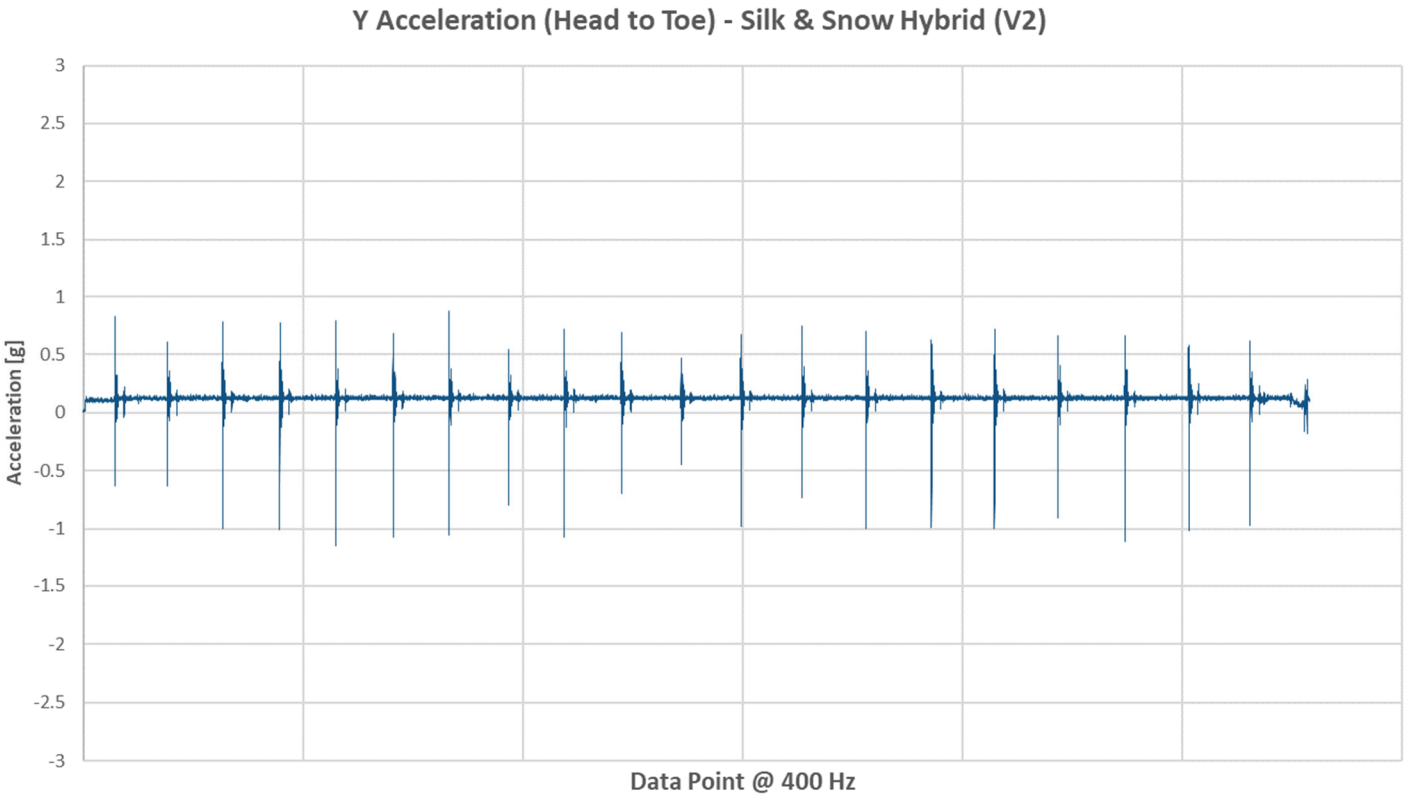

Y Acceleration (Head to Toe) - Silk & Snow (V2)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

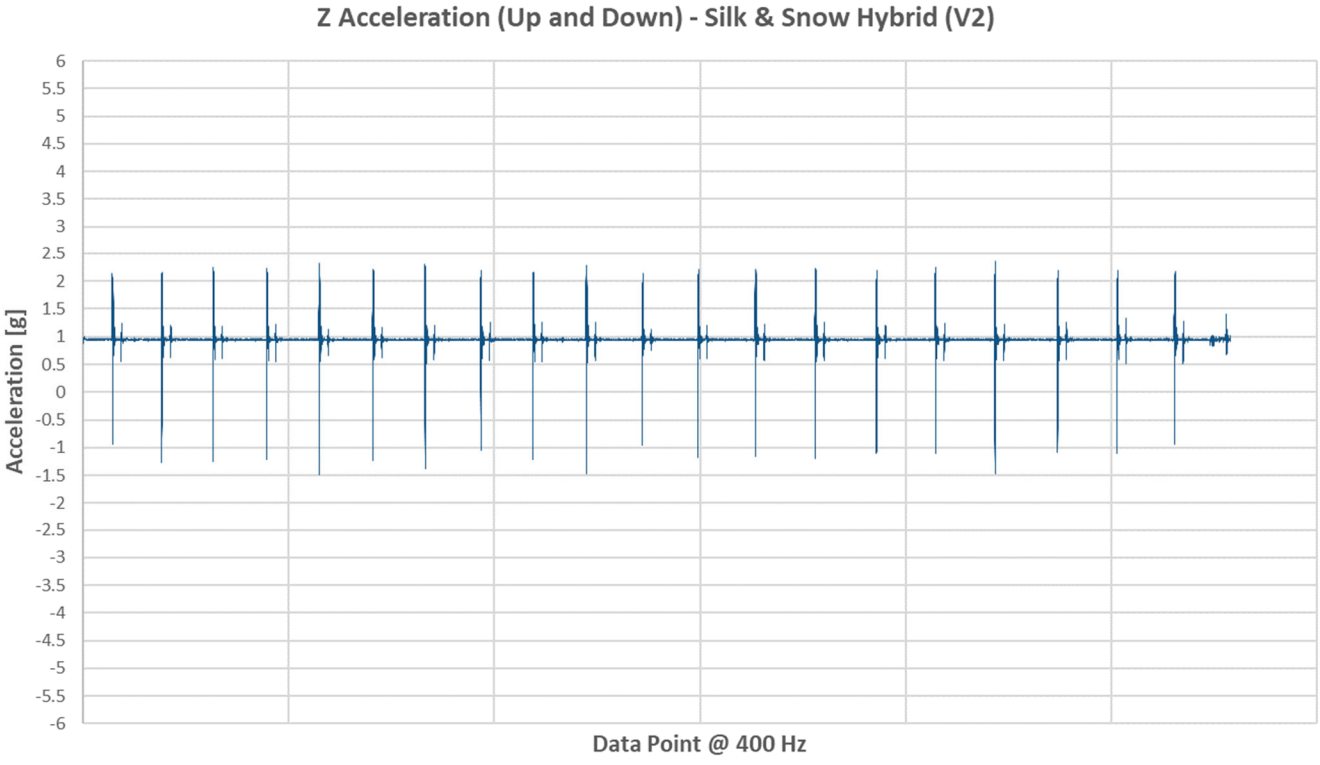

Z Acceleration (Up and Down) - Silk & Snow (V2)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – SILK & SNOW HYBRID (V2)

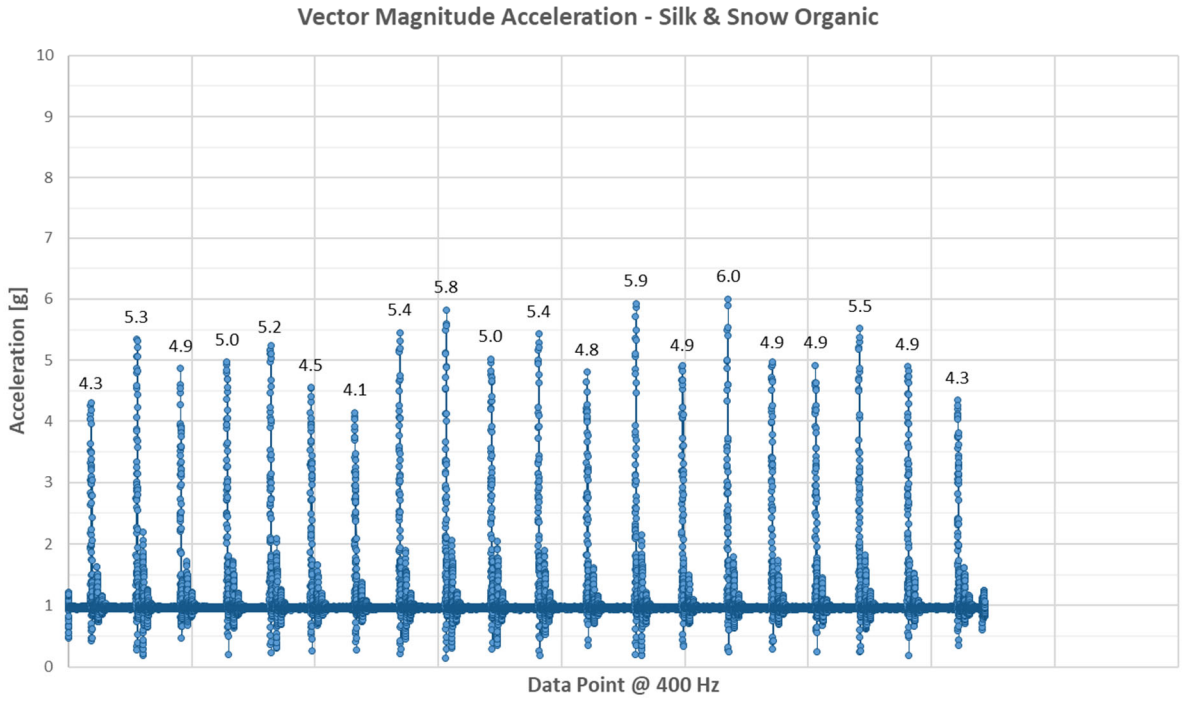


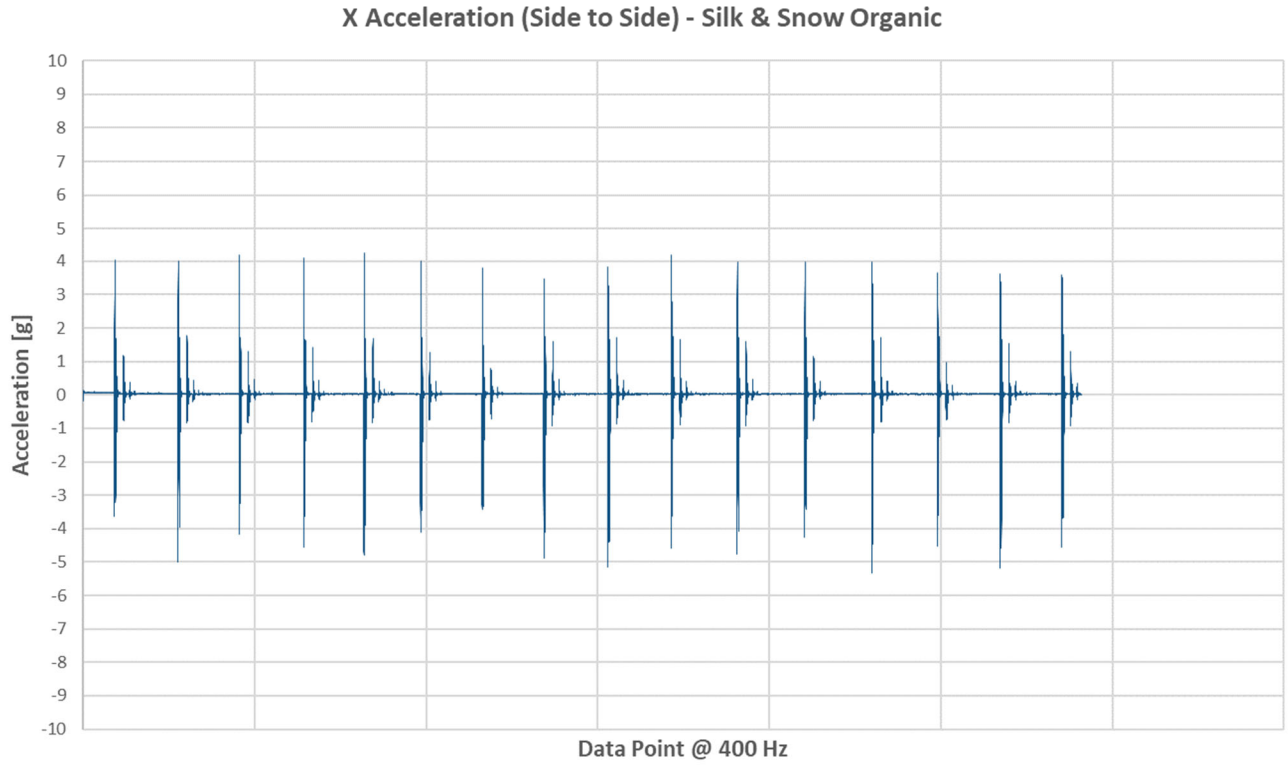


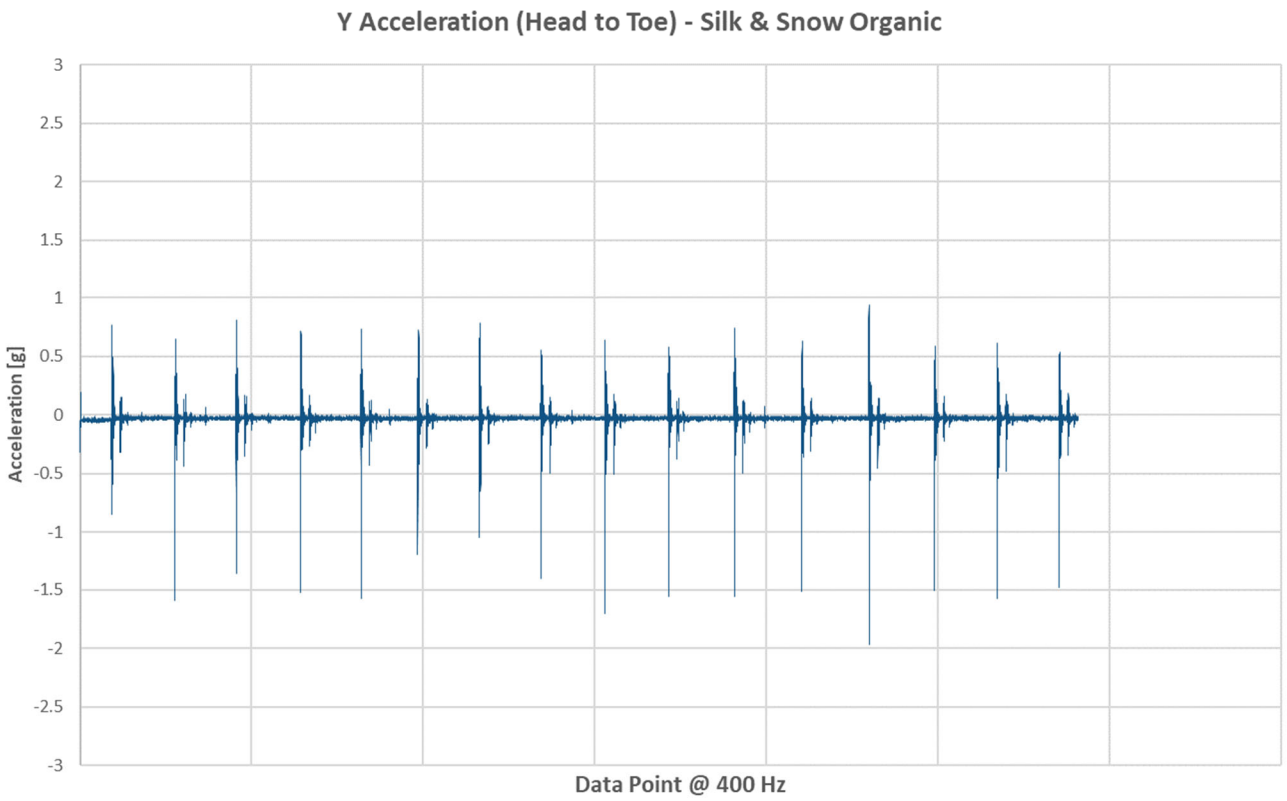

Y Acceleration (Head to Toe) - Silk & Snow Hybrid (V2)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

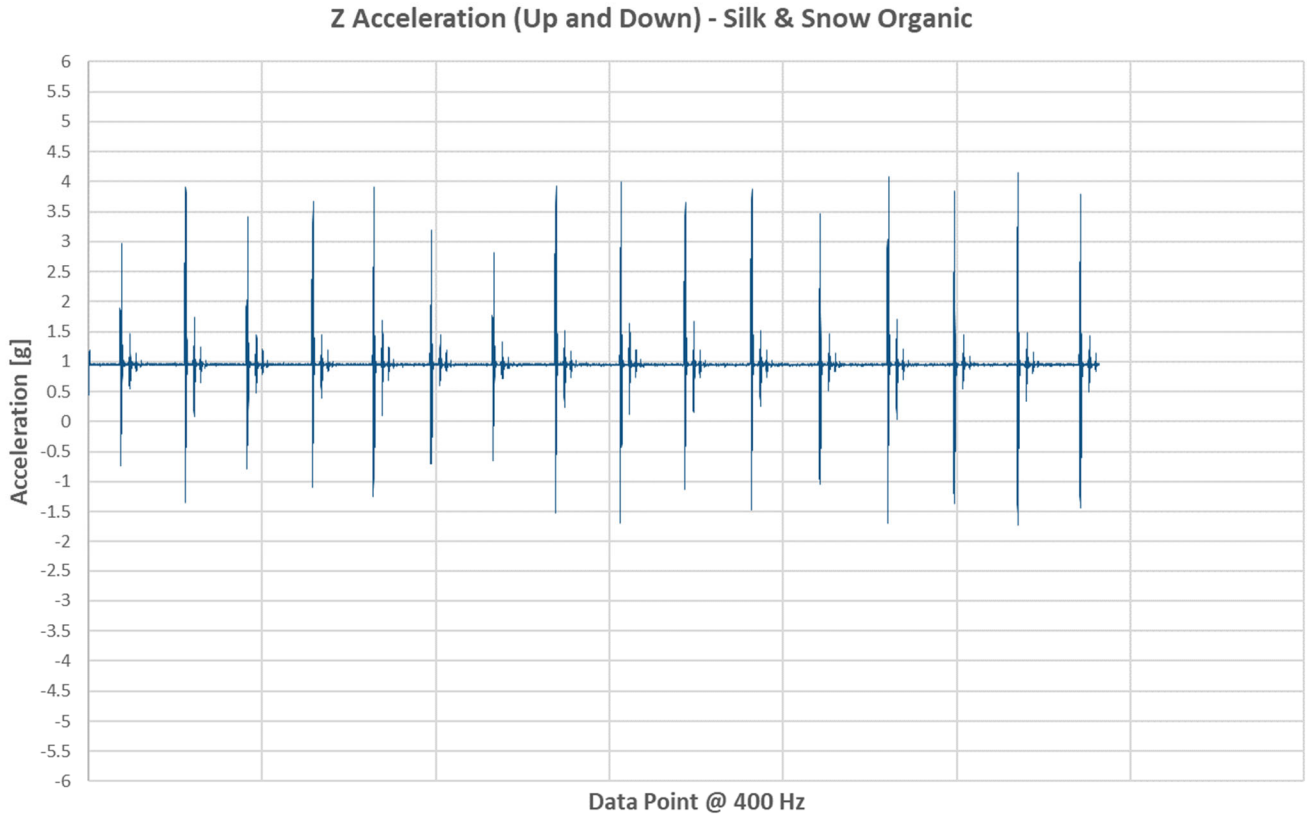

Z Acceleration (Up and Down) - Silk & Snow Hybrid (V2)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – SILK & SNOW ORGANIC

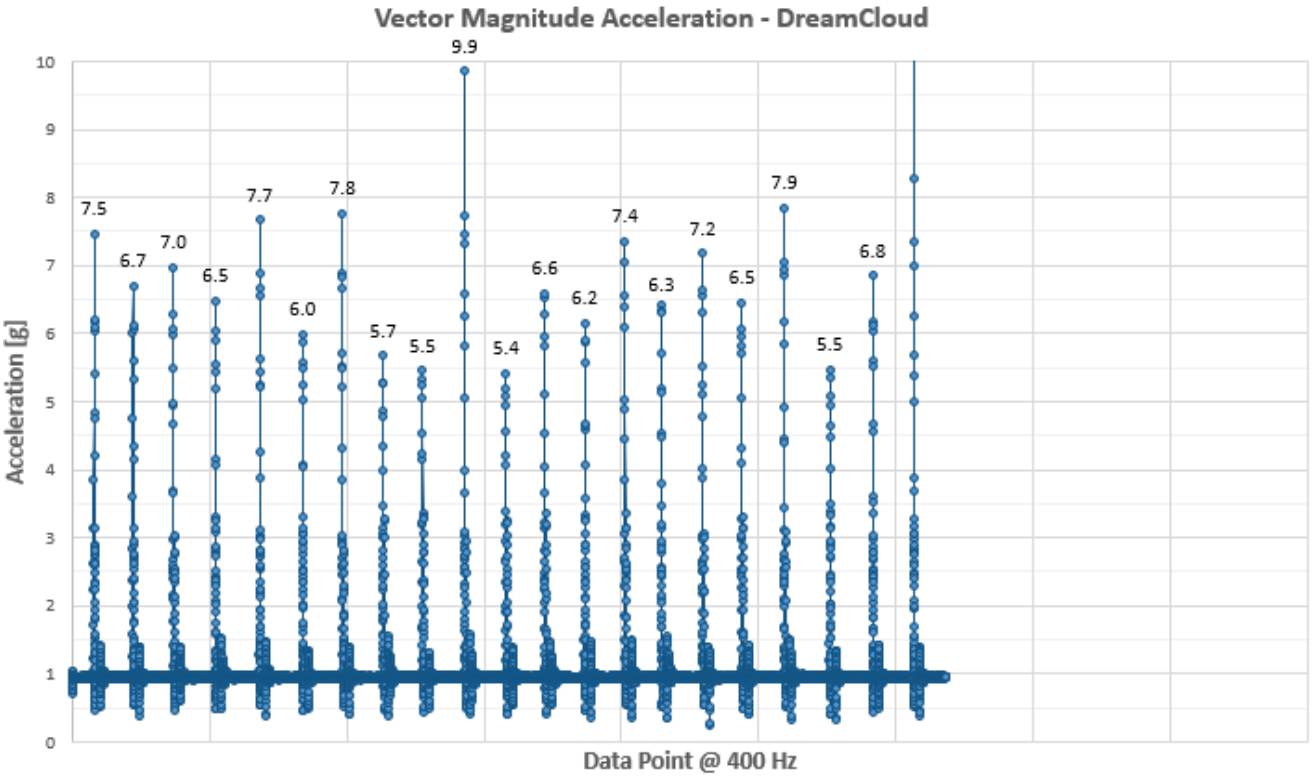


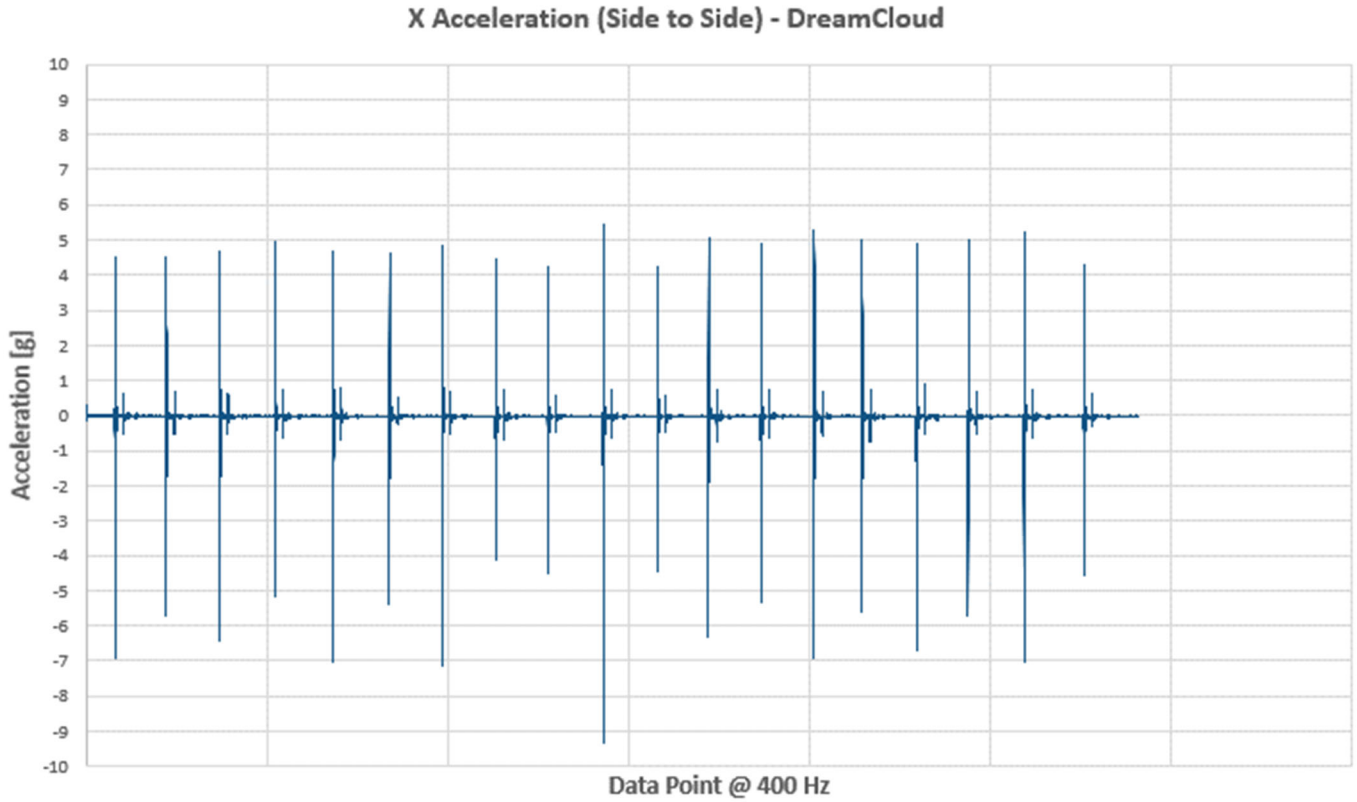


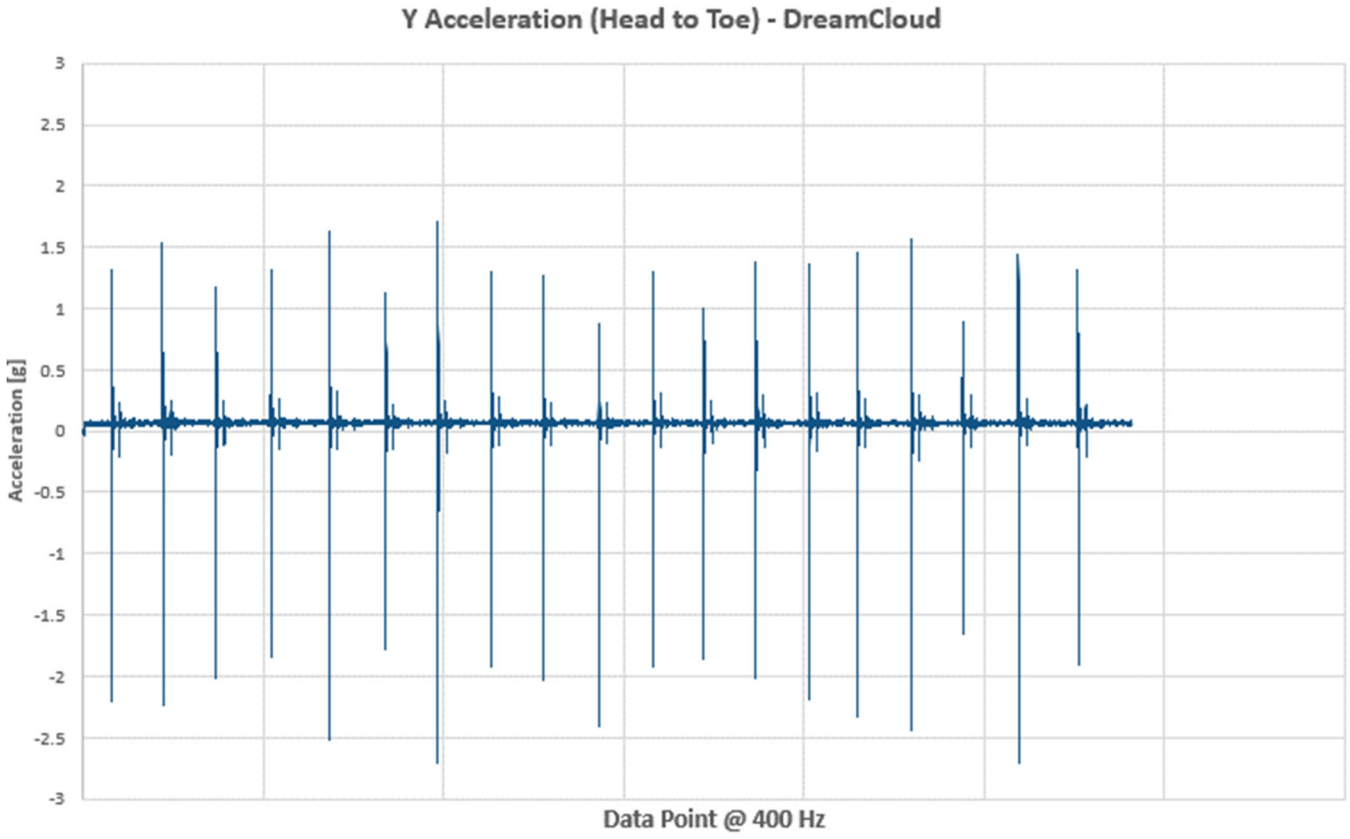

Y Acceleration (Head to Toe) - Silk & Snow Organic
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

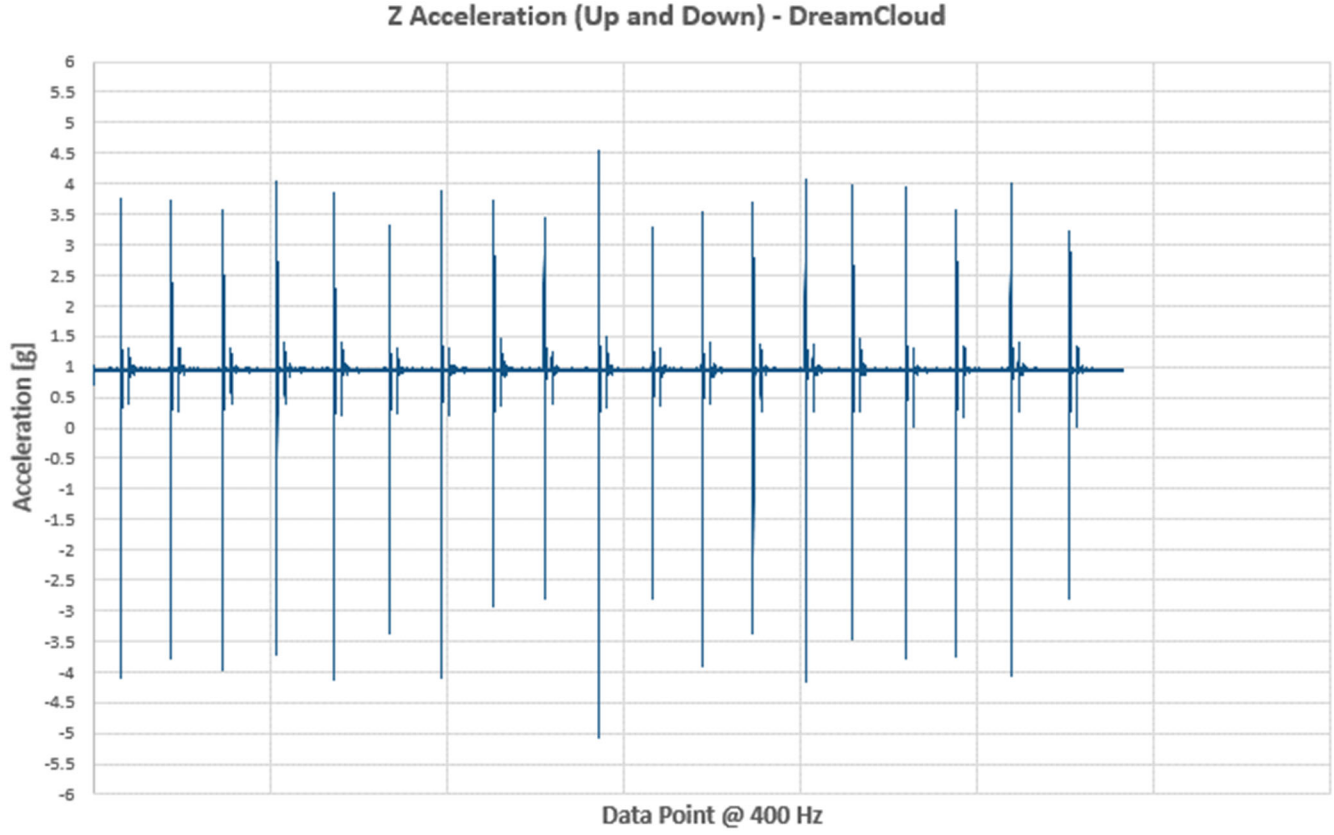

Z Acceleration (Up and Down) - Silk & Snow Organic
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – DREAMCLOUD

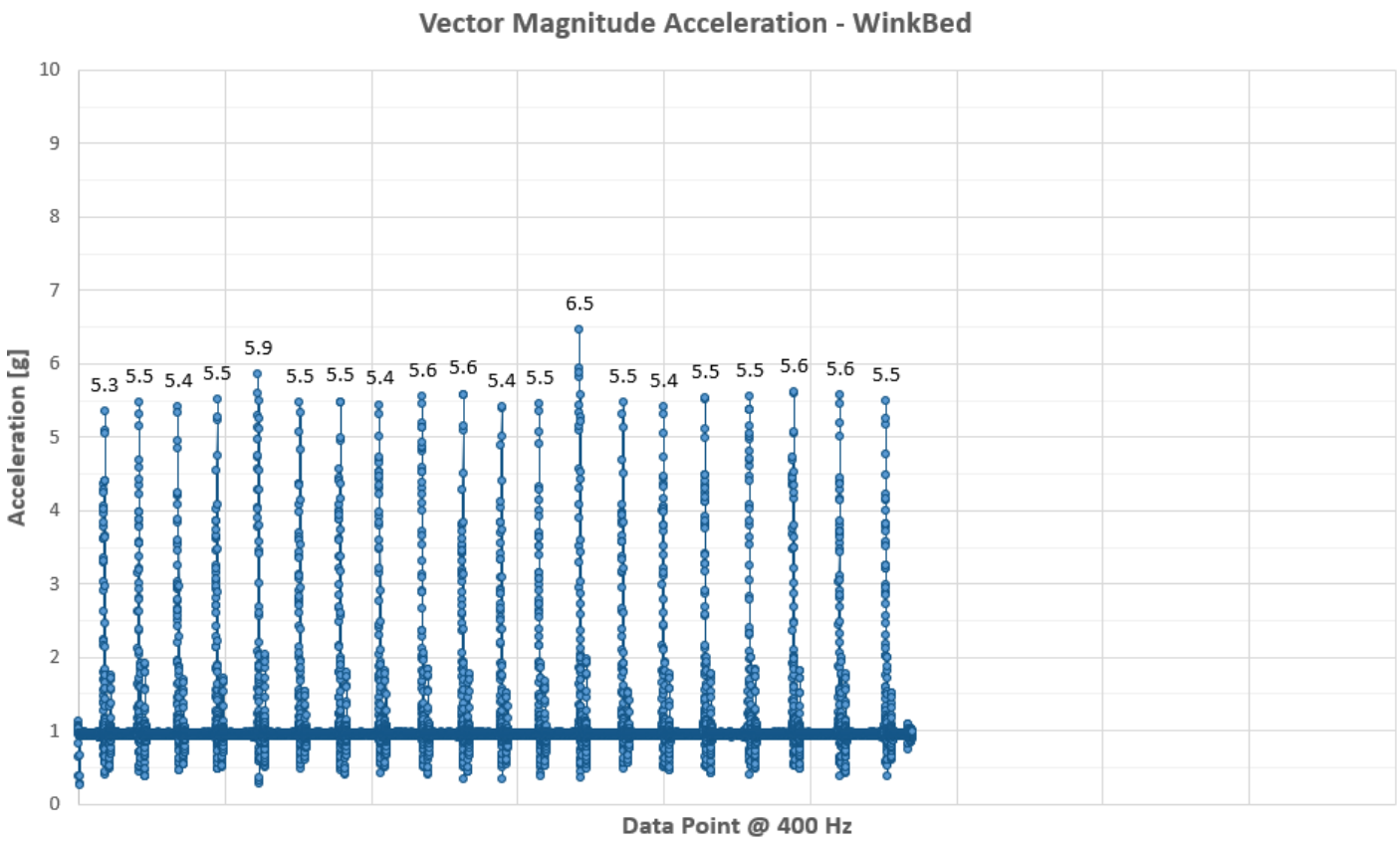


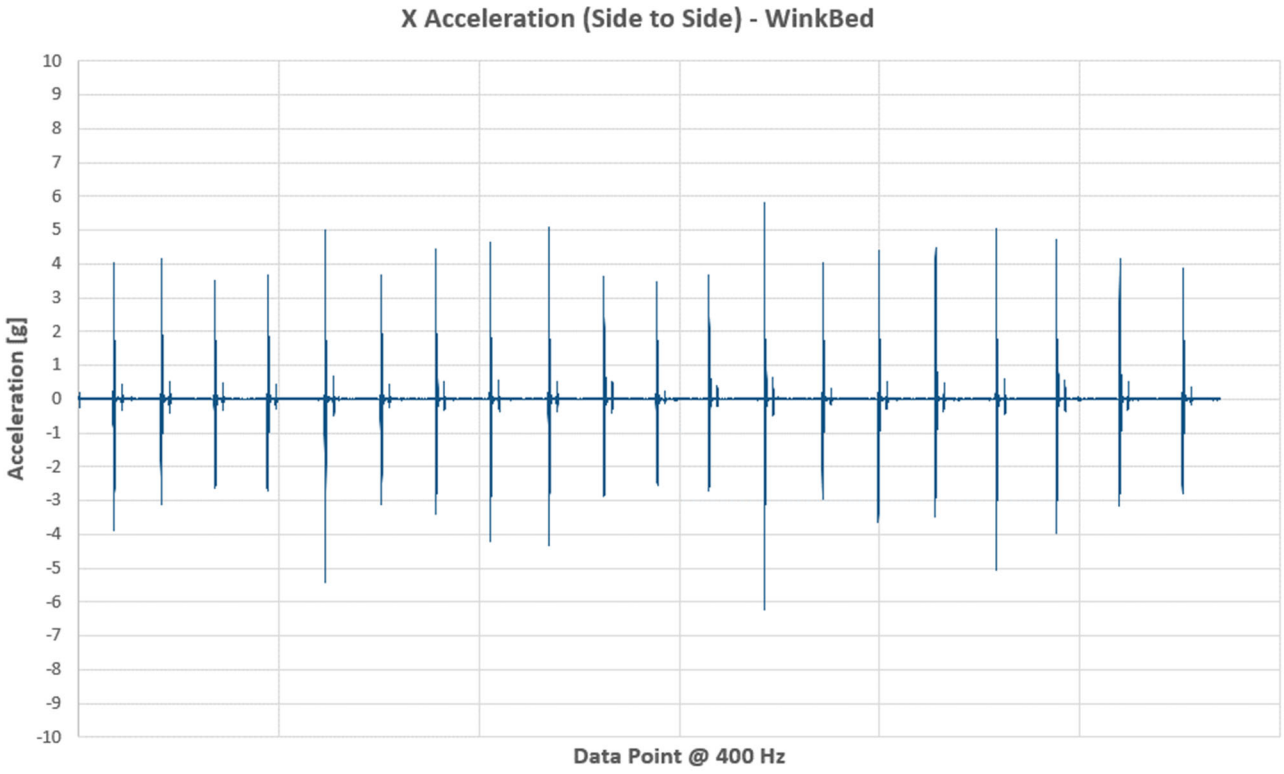


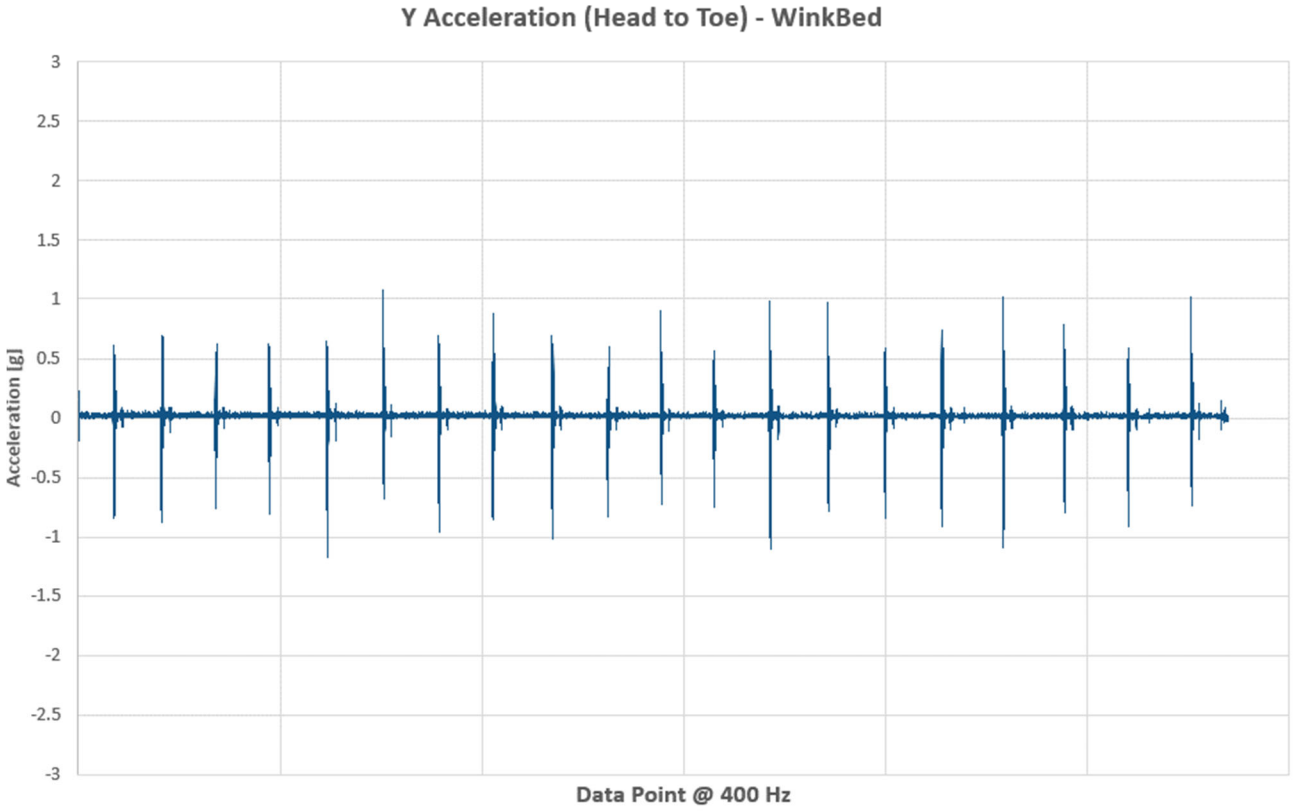

Y Acceleration (Head to Toe) - DreamCloud
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

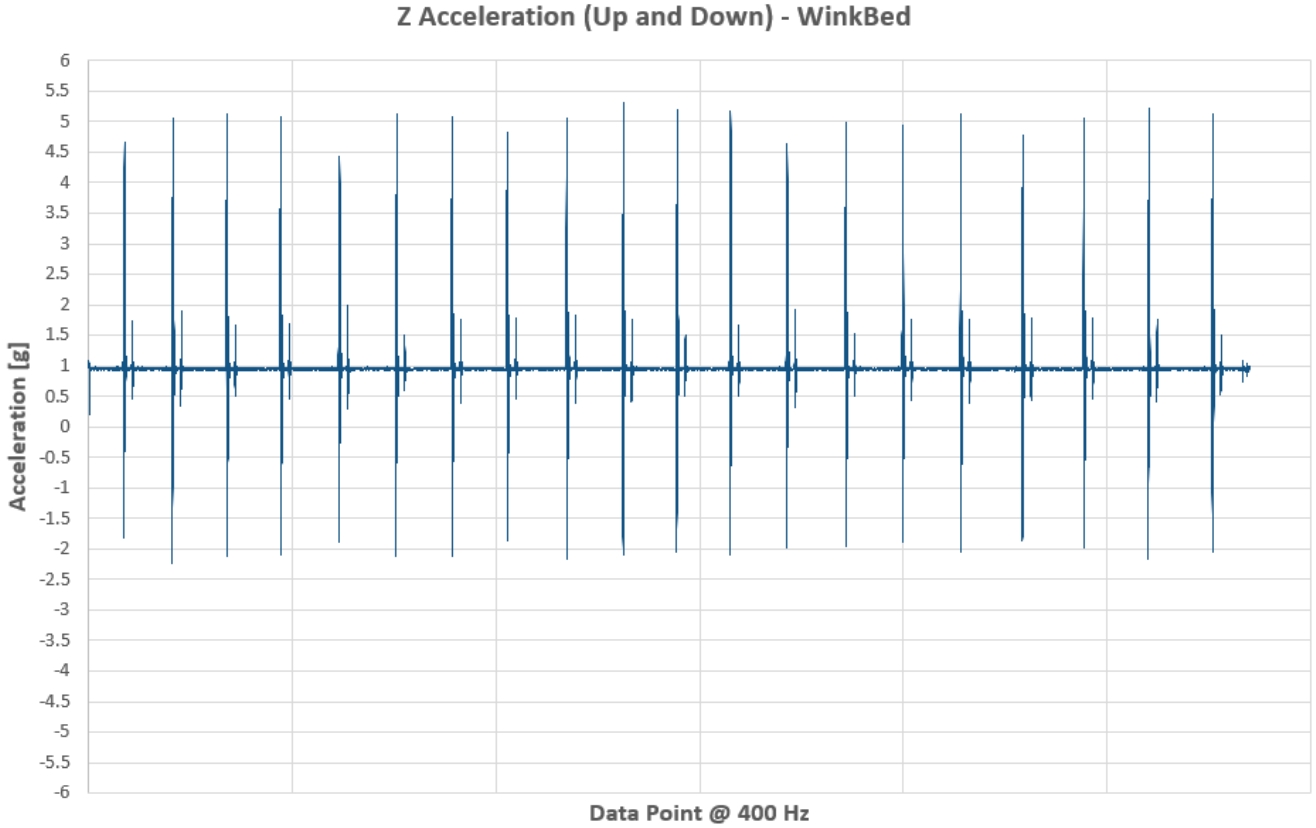

Z Acceleration (Up and Down) - DreamCloud
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – WINKBED

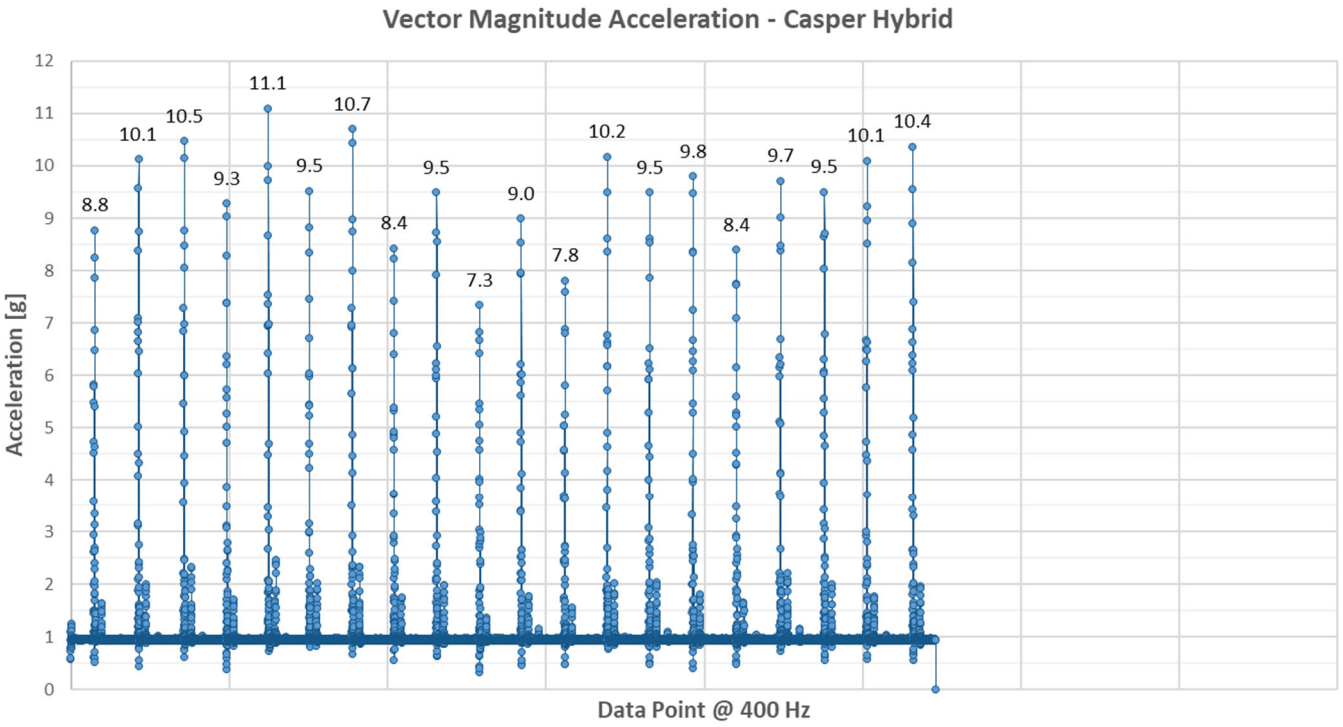


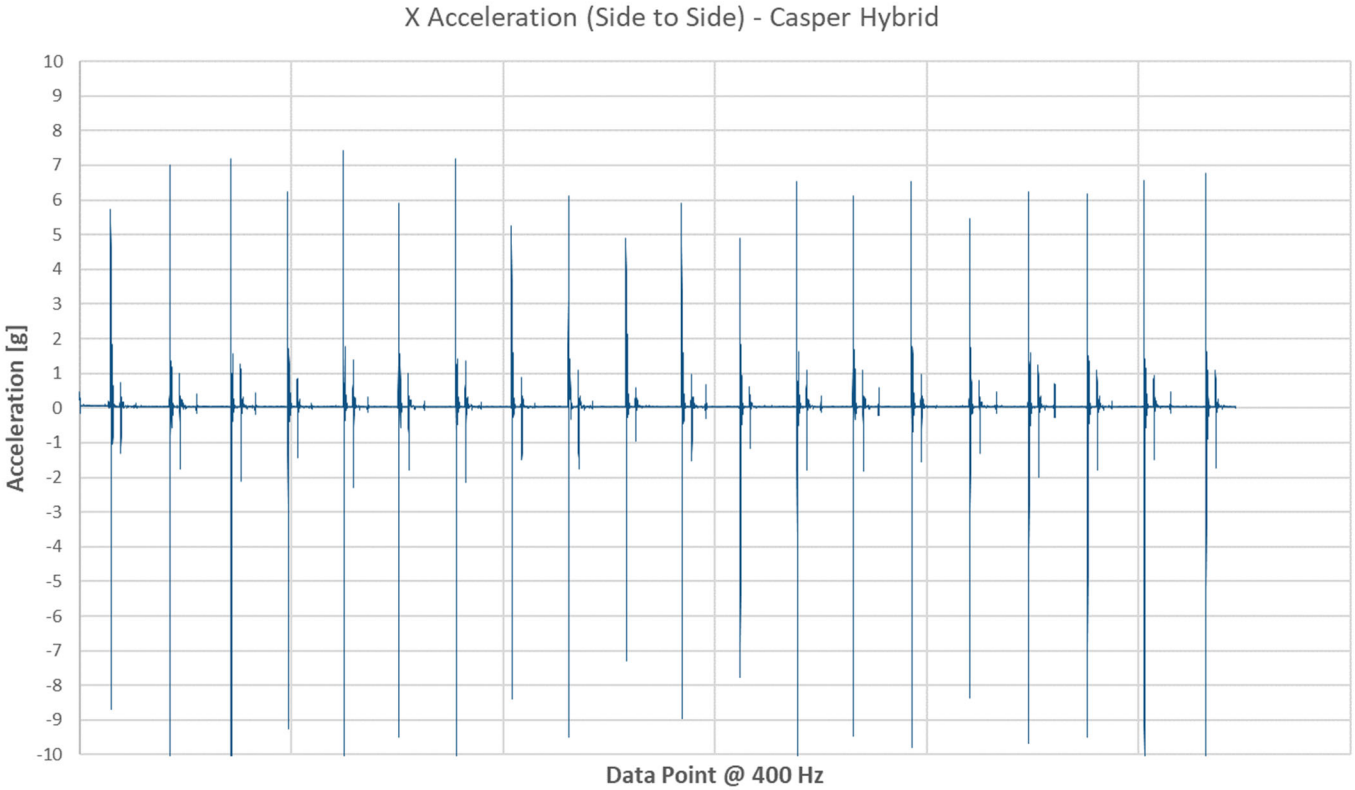


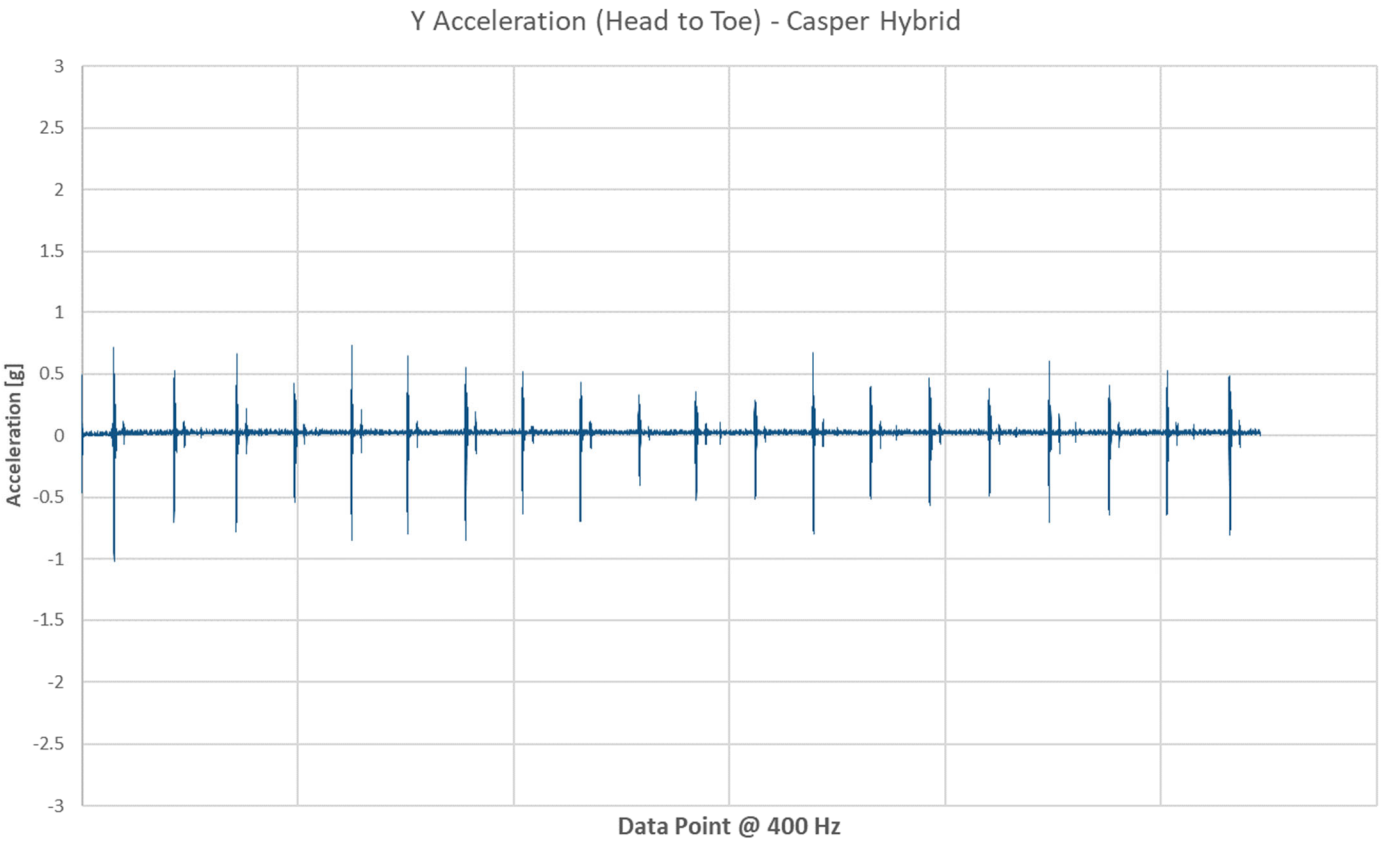

Y Acceleration (Head to Toe) - WinkBed
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

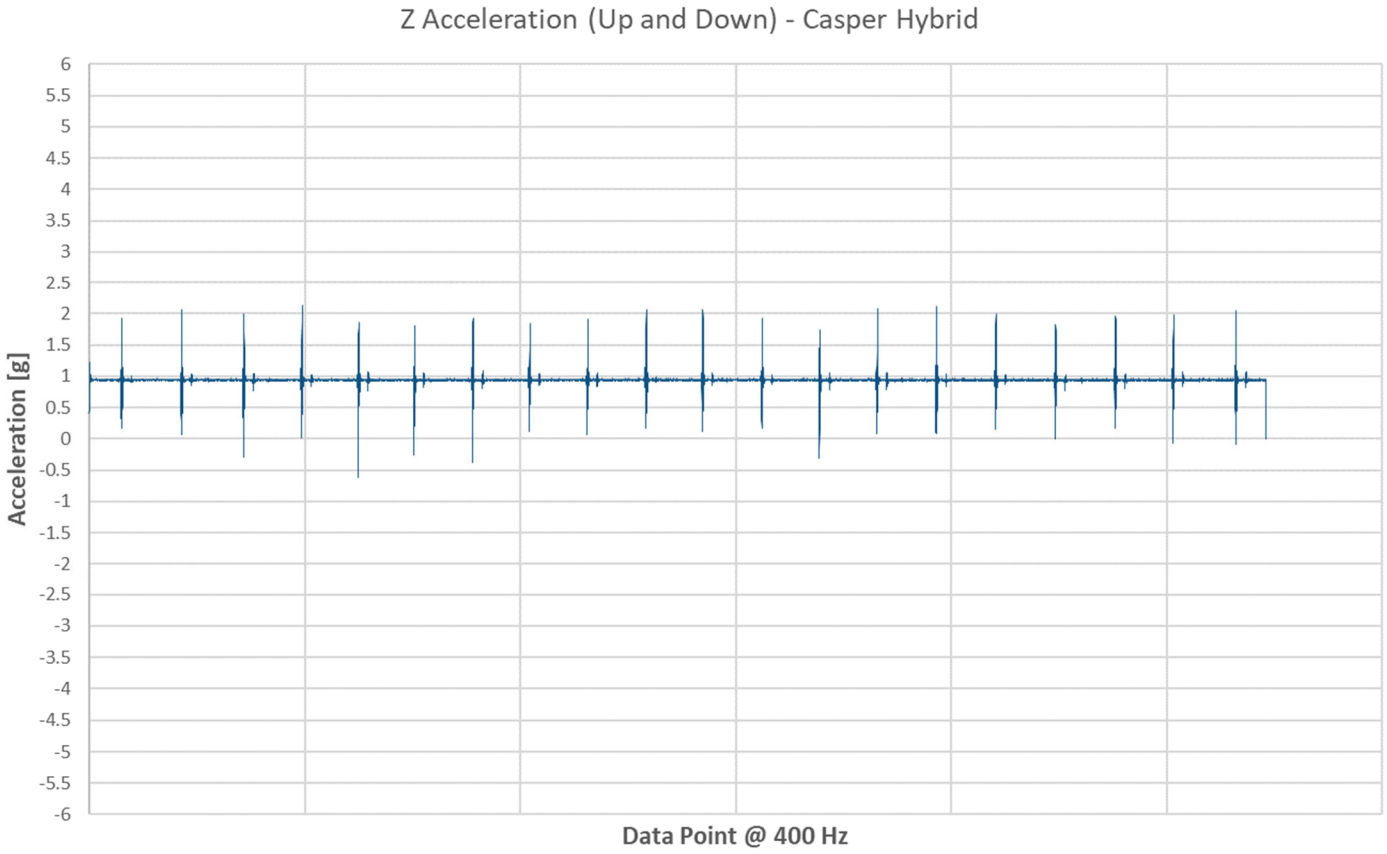

Z Acceleration (Up and Down) - WinkBed
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – CASPER HYBRID

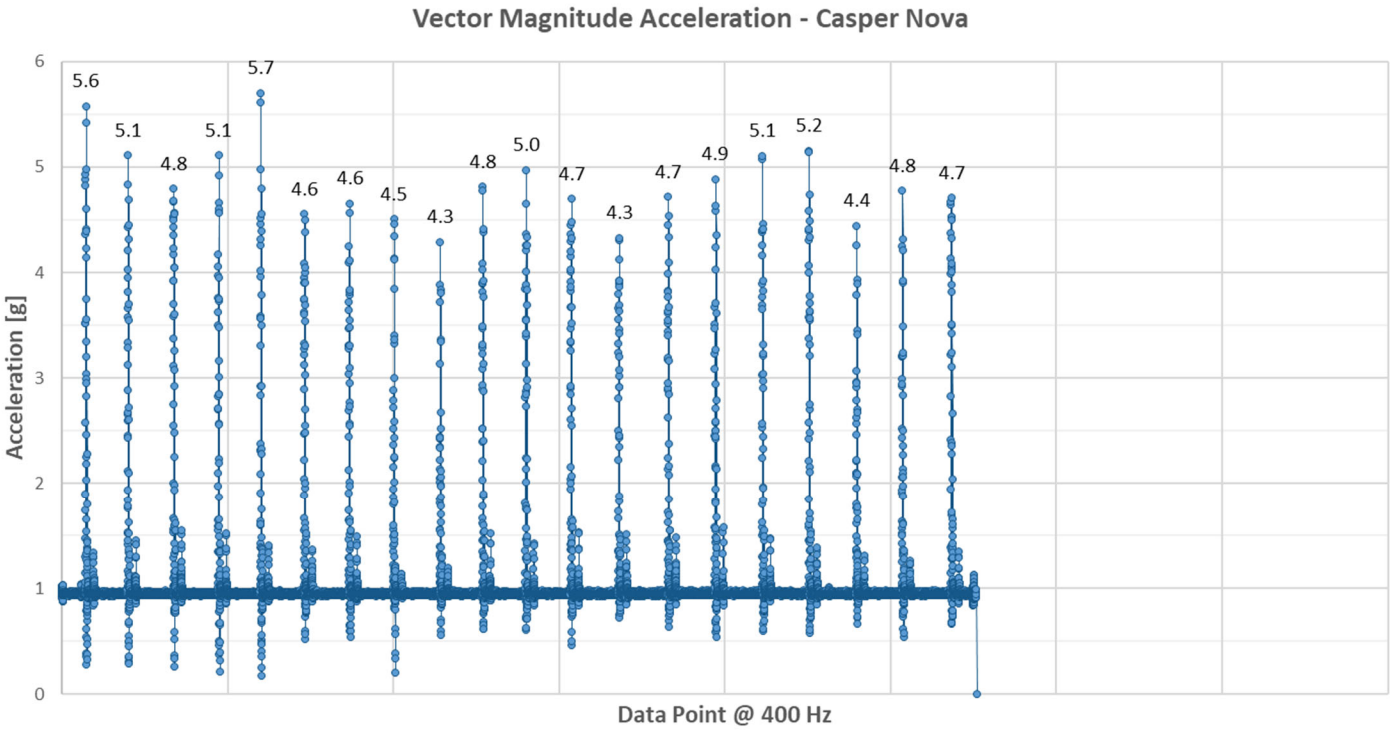


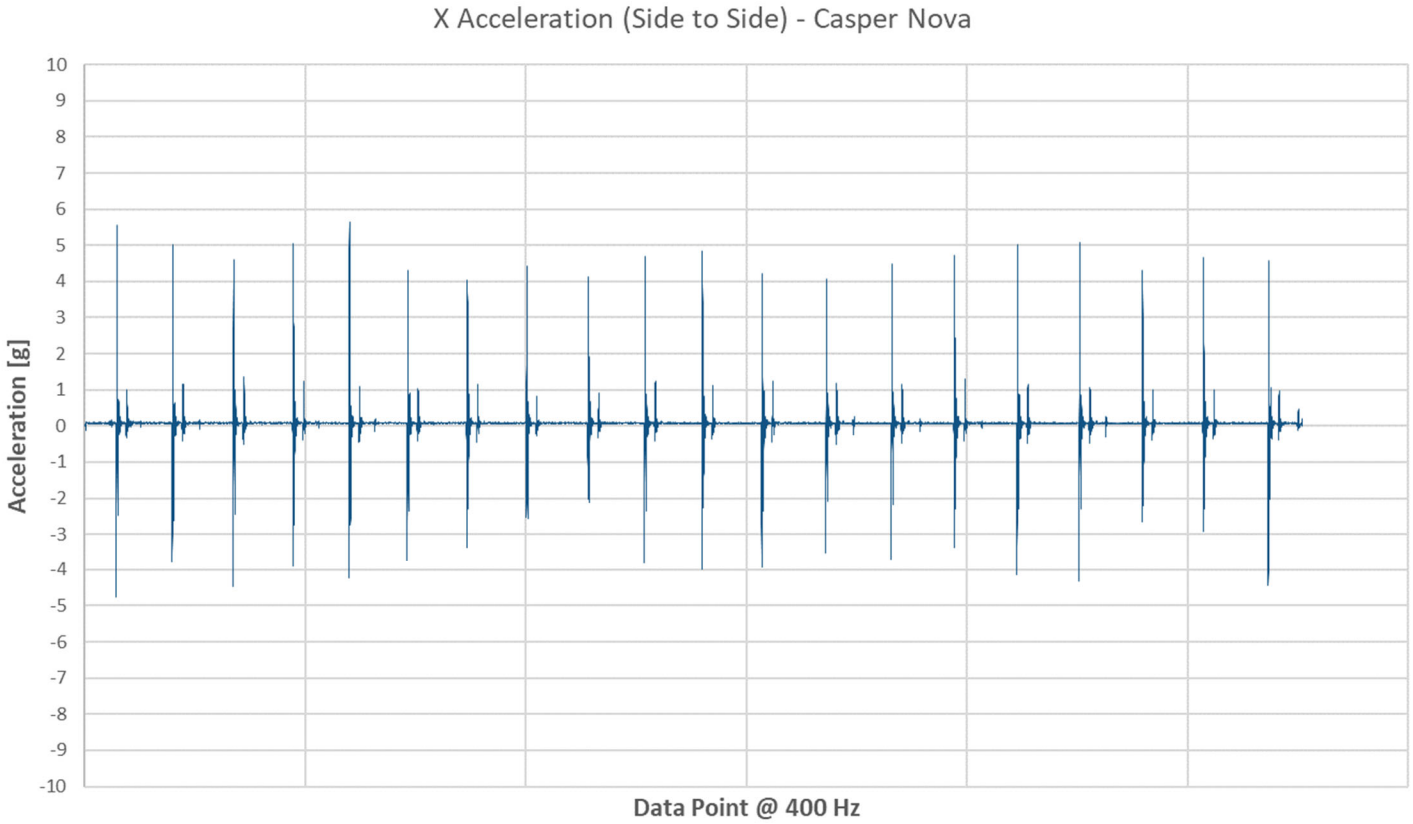


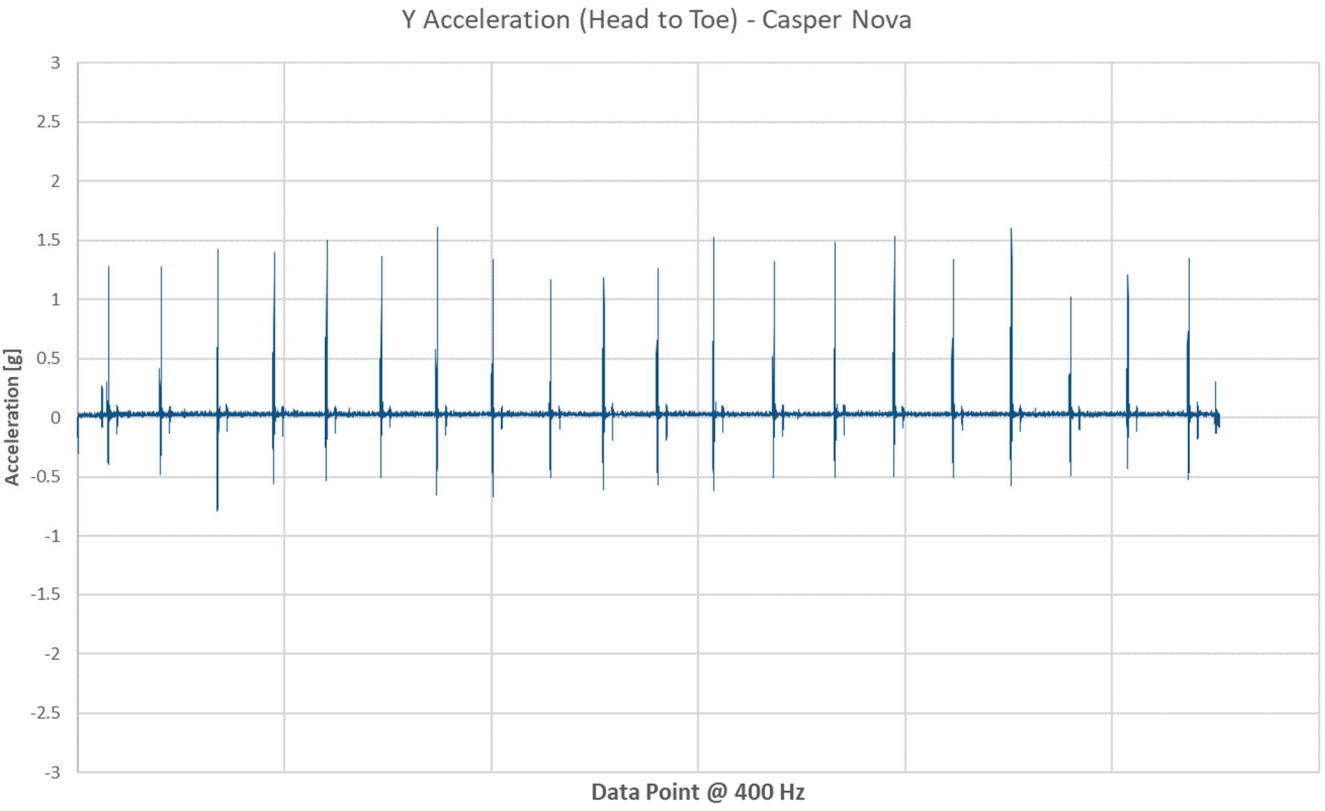

Y Acceleration (Head to Toe) - Casper Hybrid
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

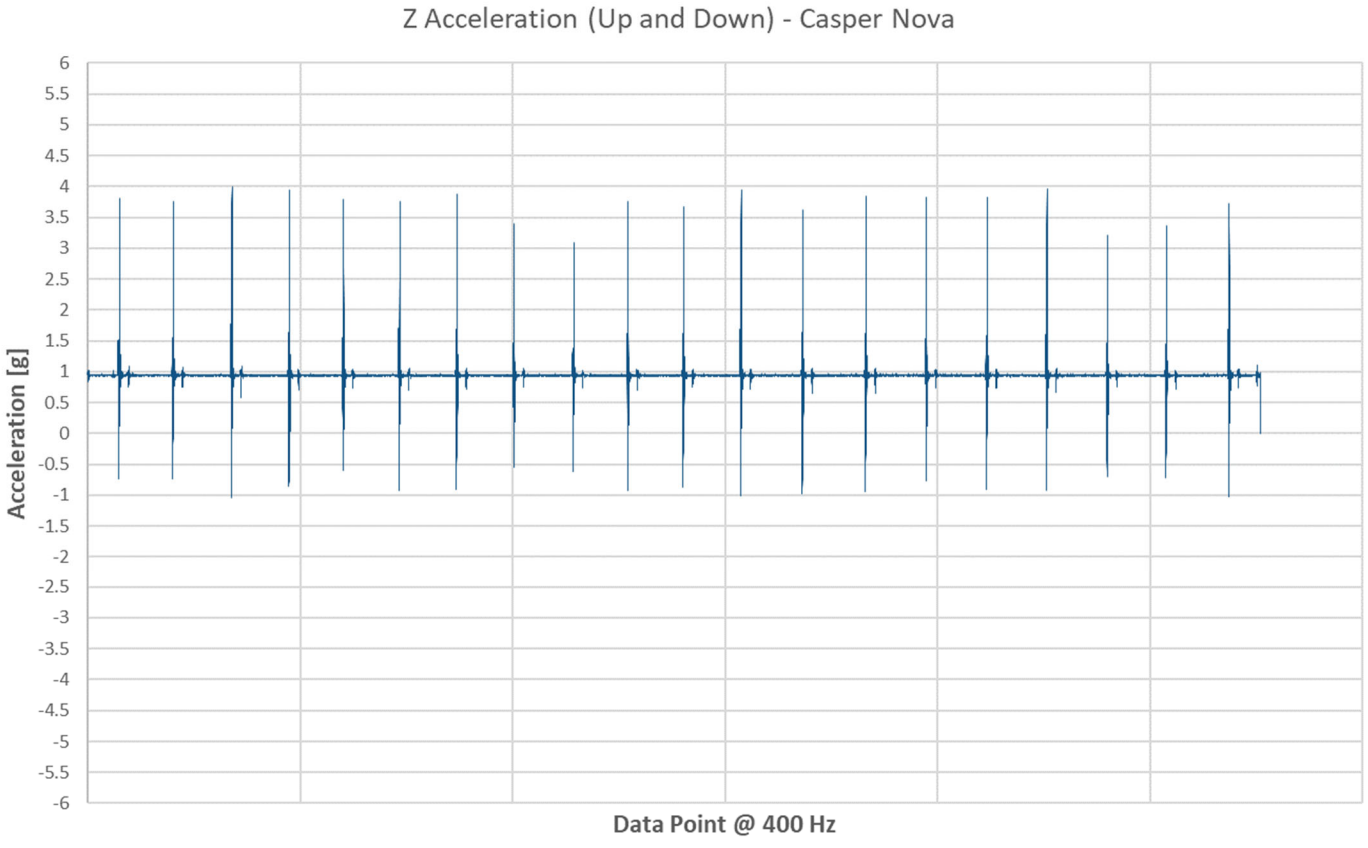

Z Acceleration (Up and Down) - Casper Hybrid
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – CASPER NOVA

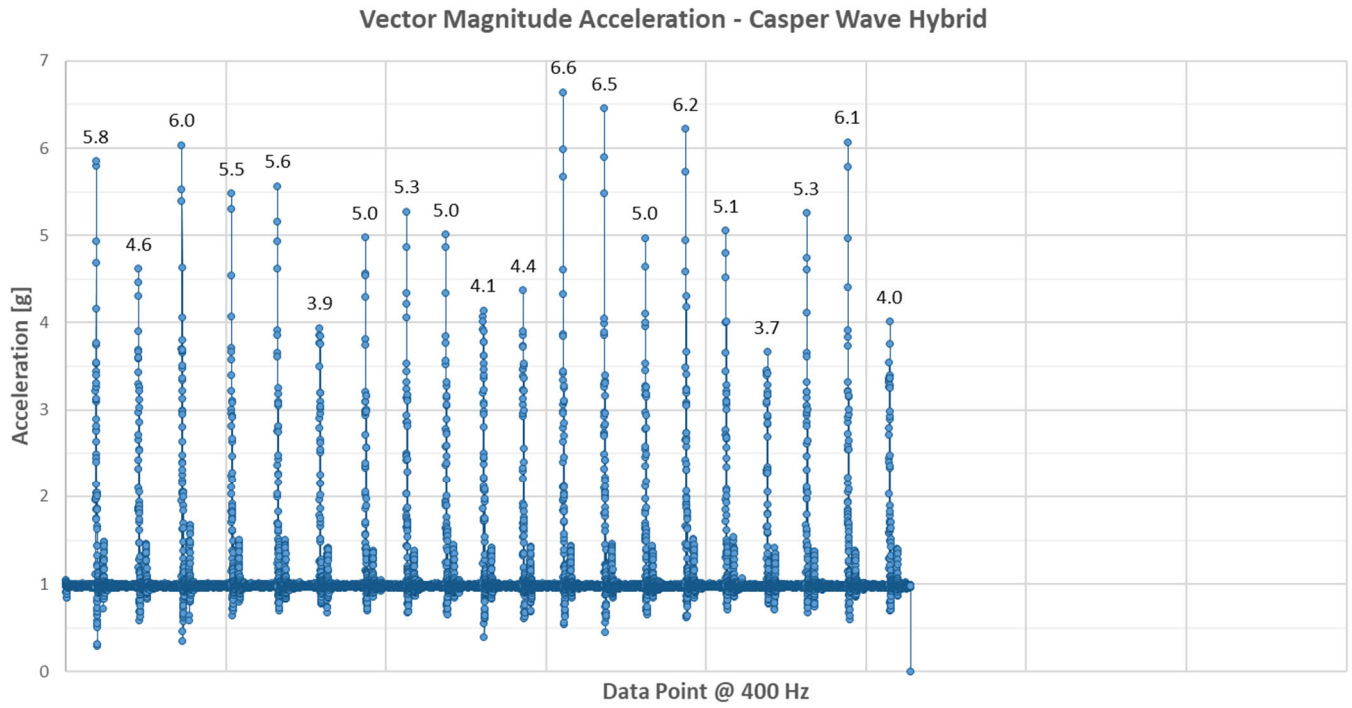


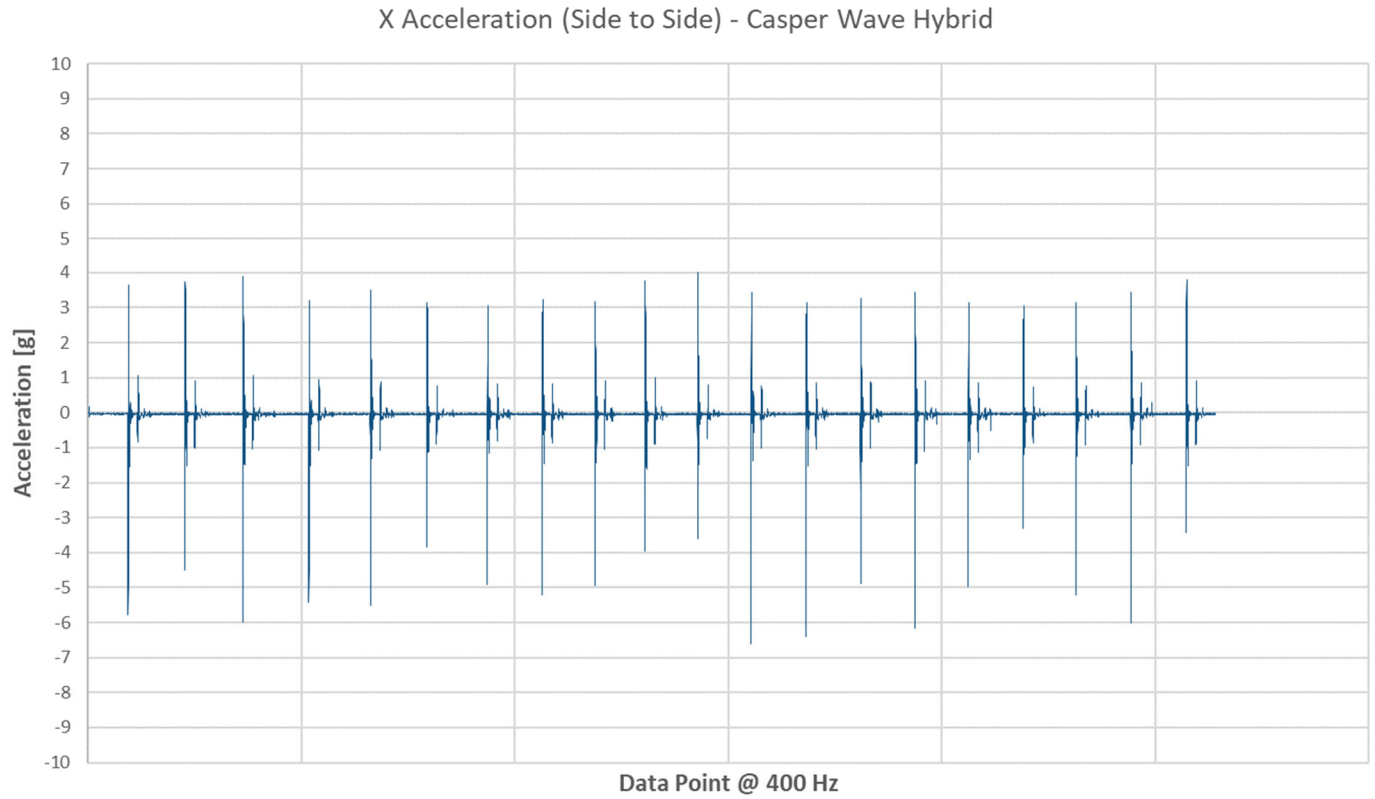


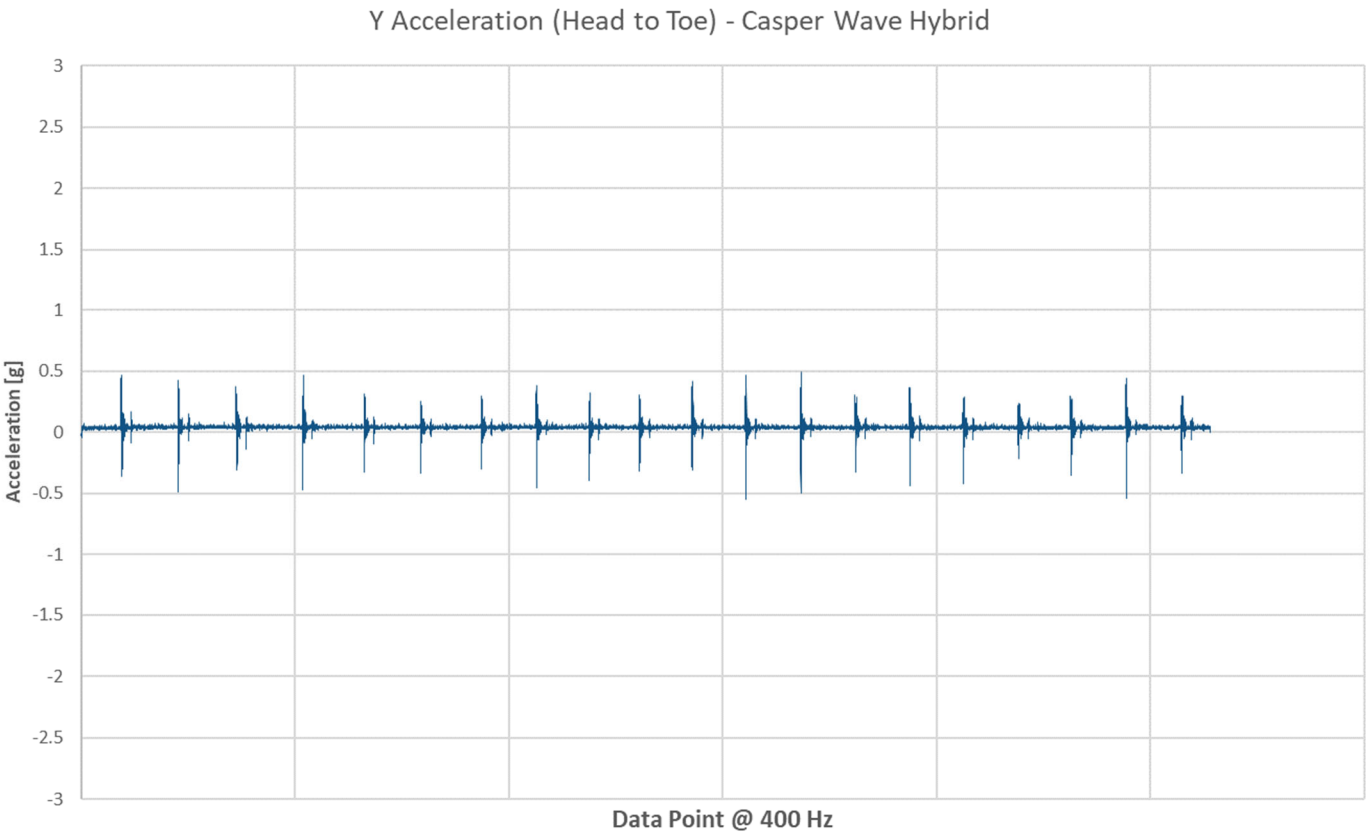

Y Acceleration (Head to Toe) - Casper Nova
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

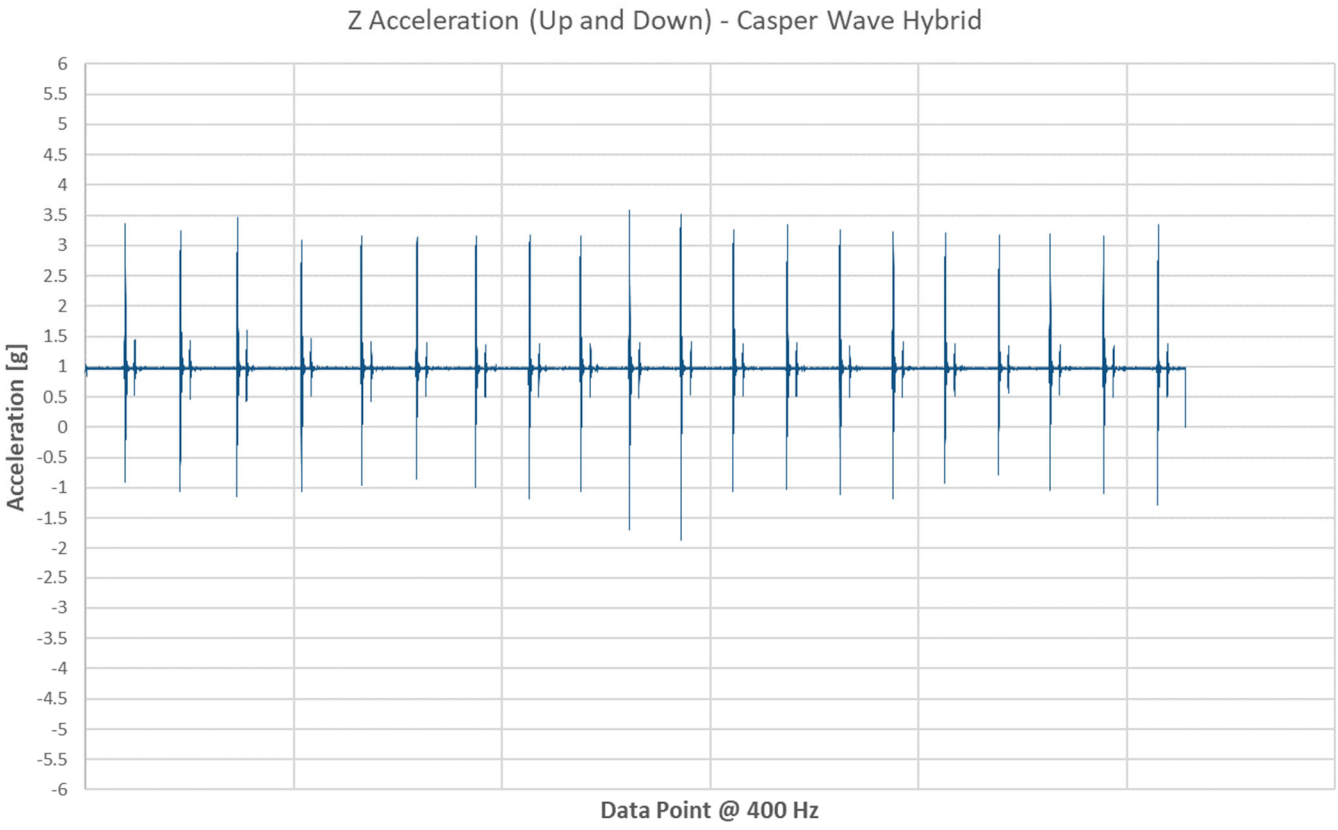

Z Acceleration (Up and Down) - Casper Nova
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – CASPER WAVE HYBRID

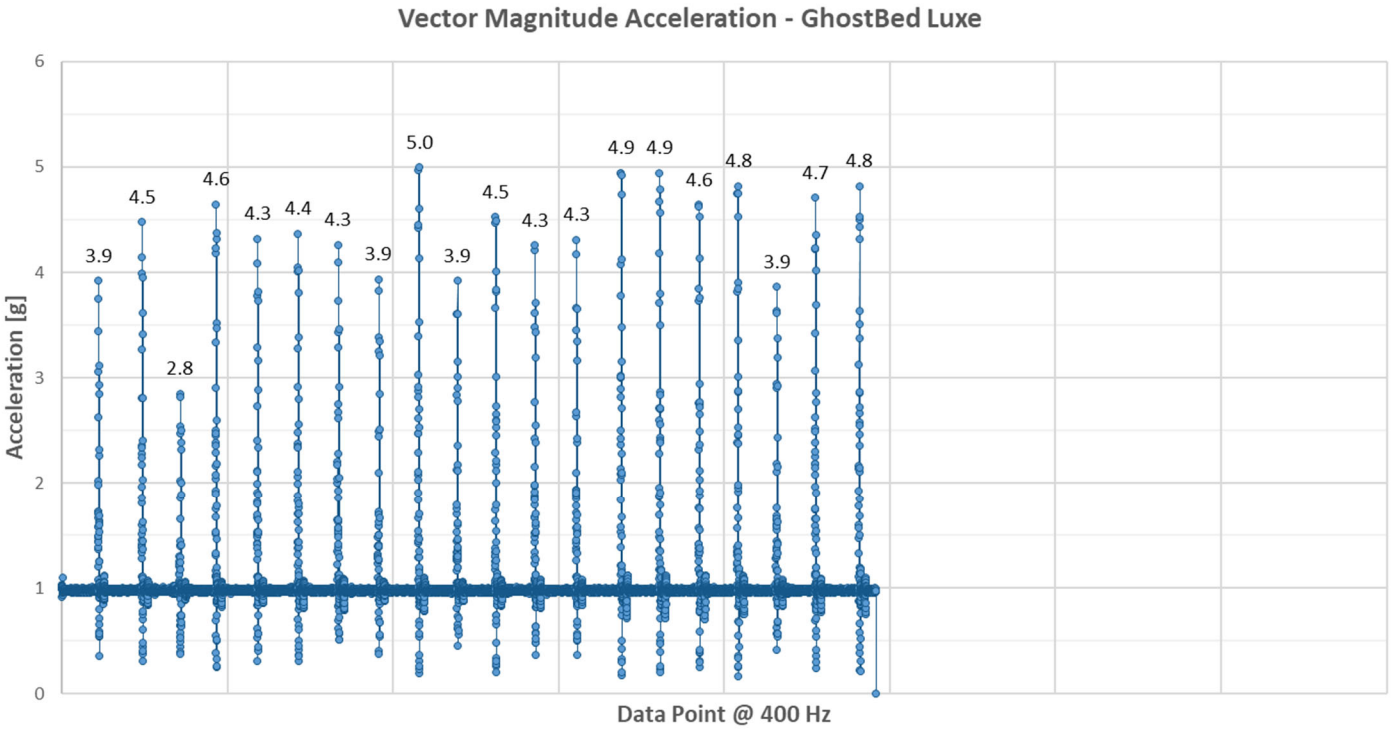


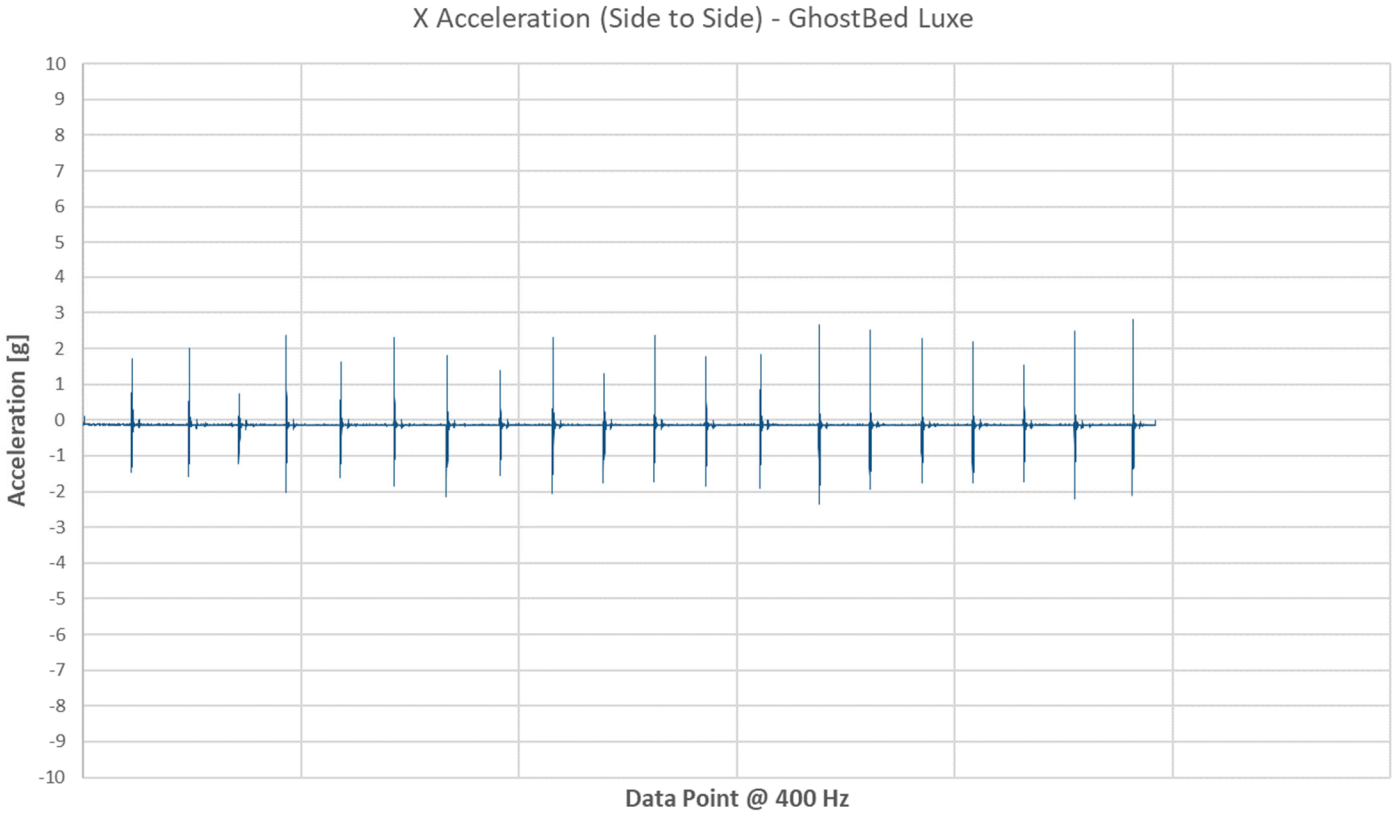


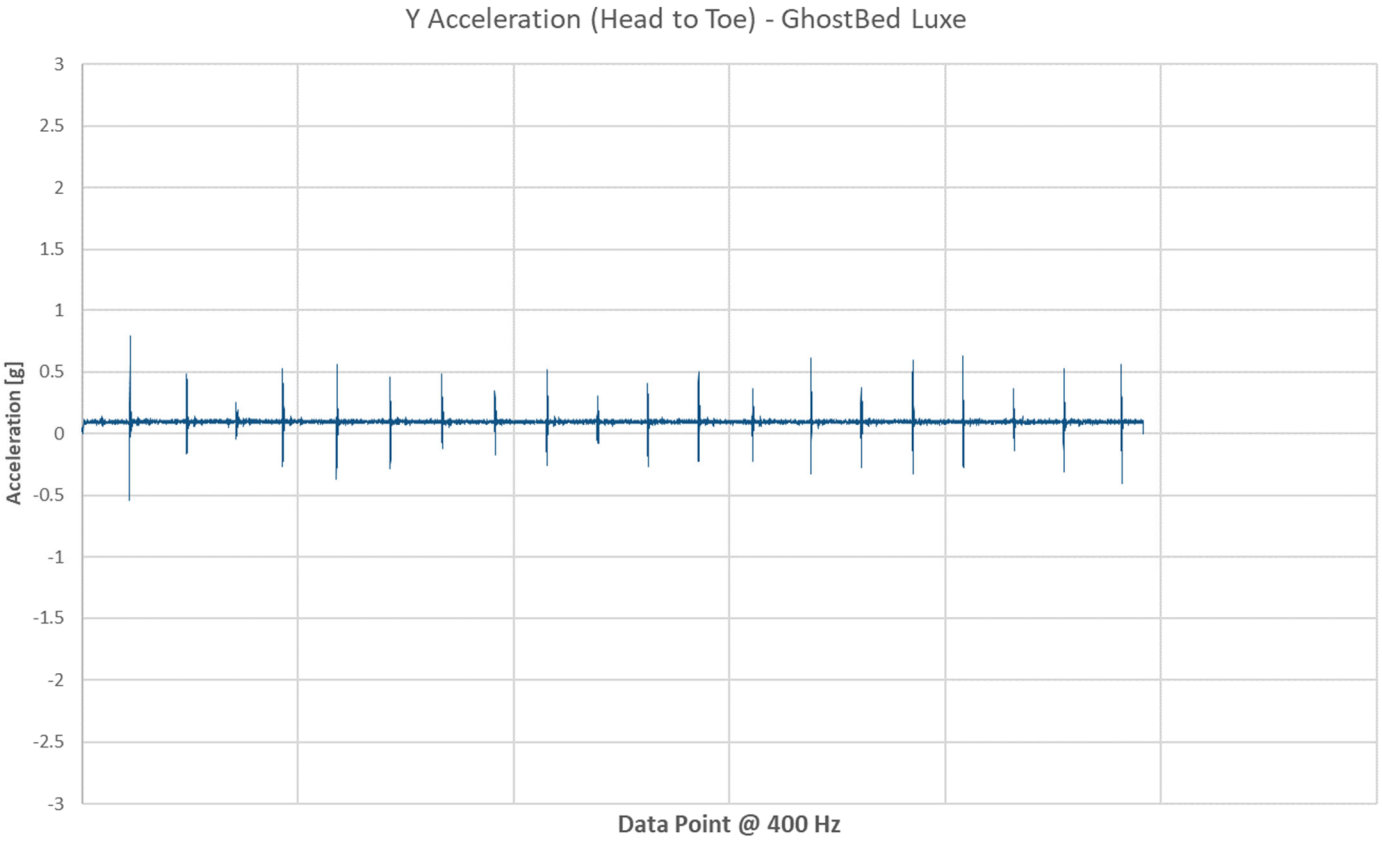

Y Acceleration (Head to Toe) - Casper Wave Hybrid
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

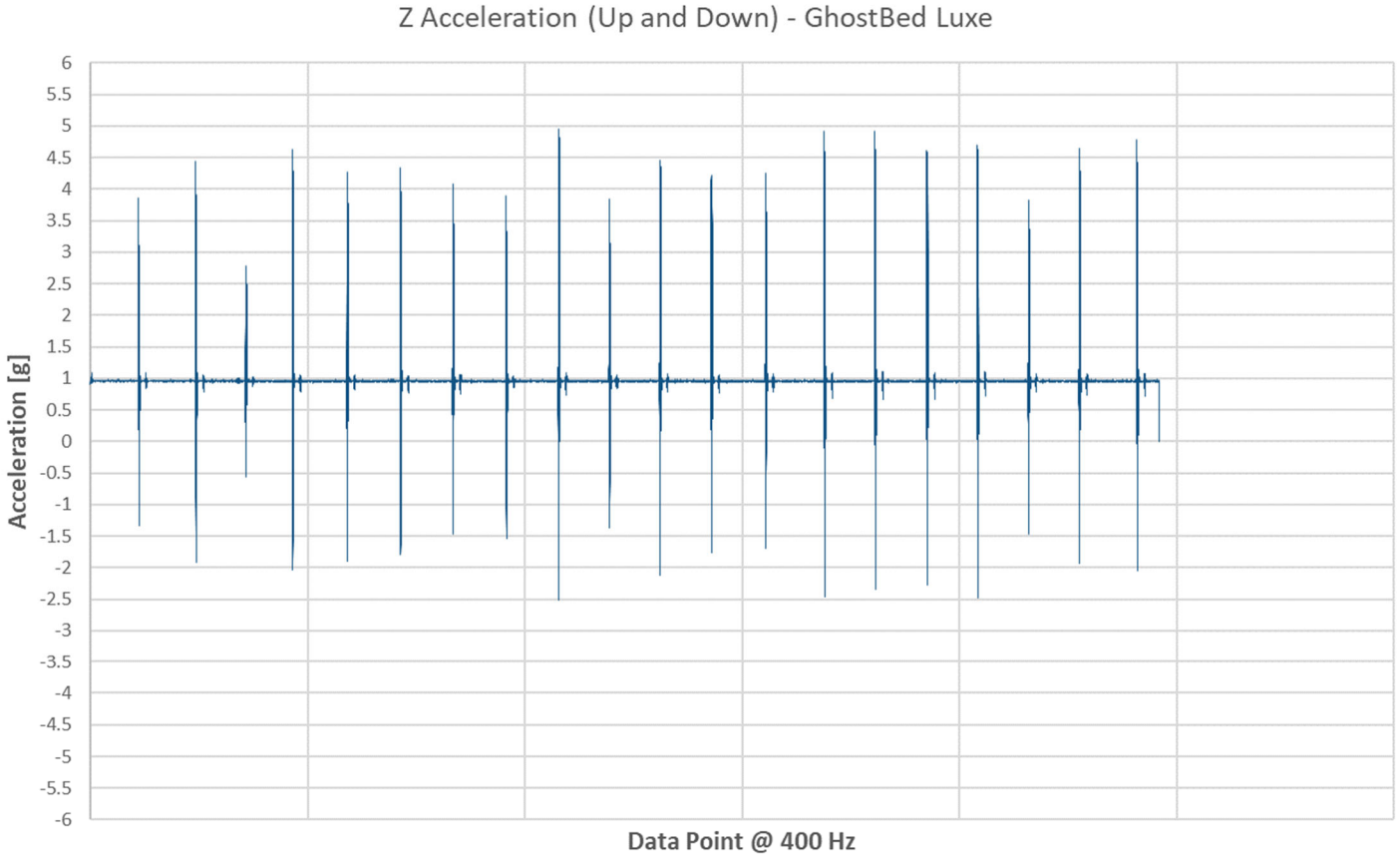

Z Acceleration (Up and Down) - Casper Wave Hybrid
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – GHOSTBED LUXE

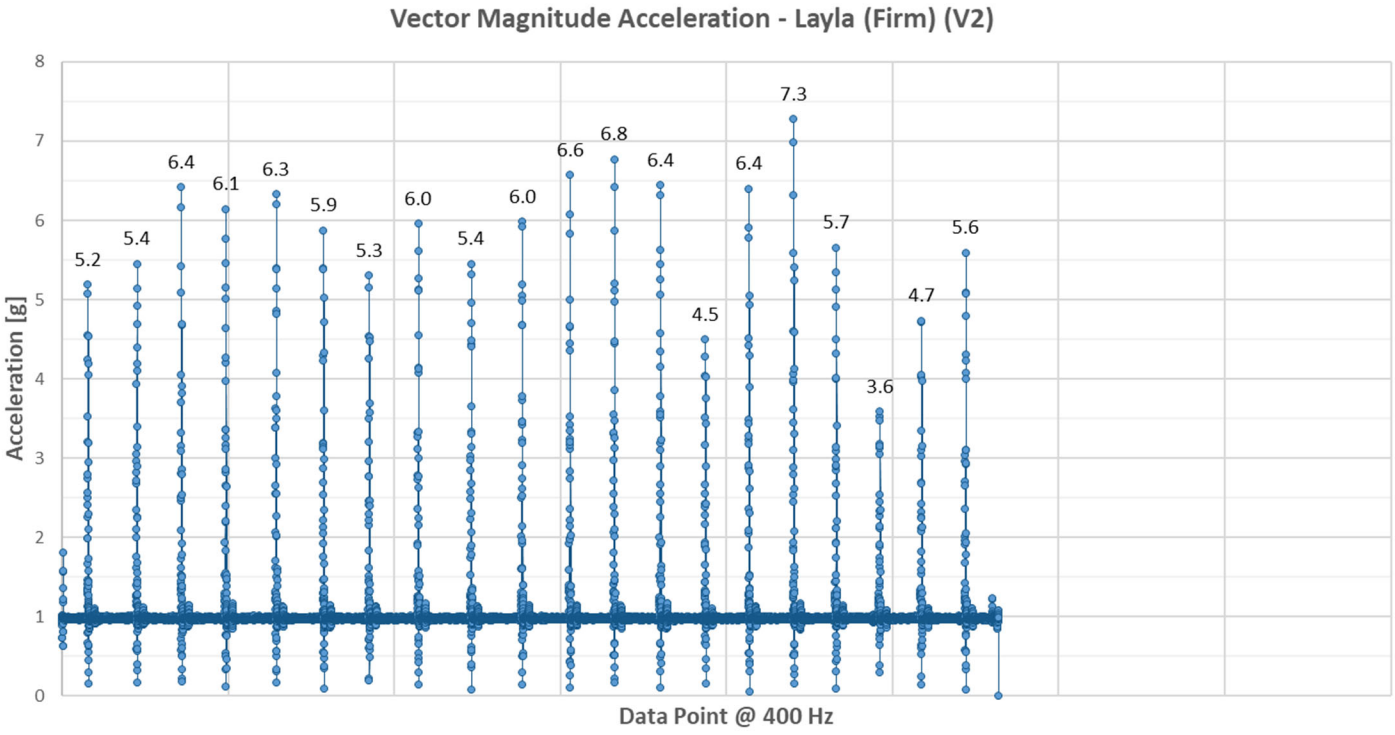


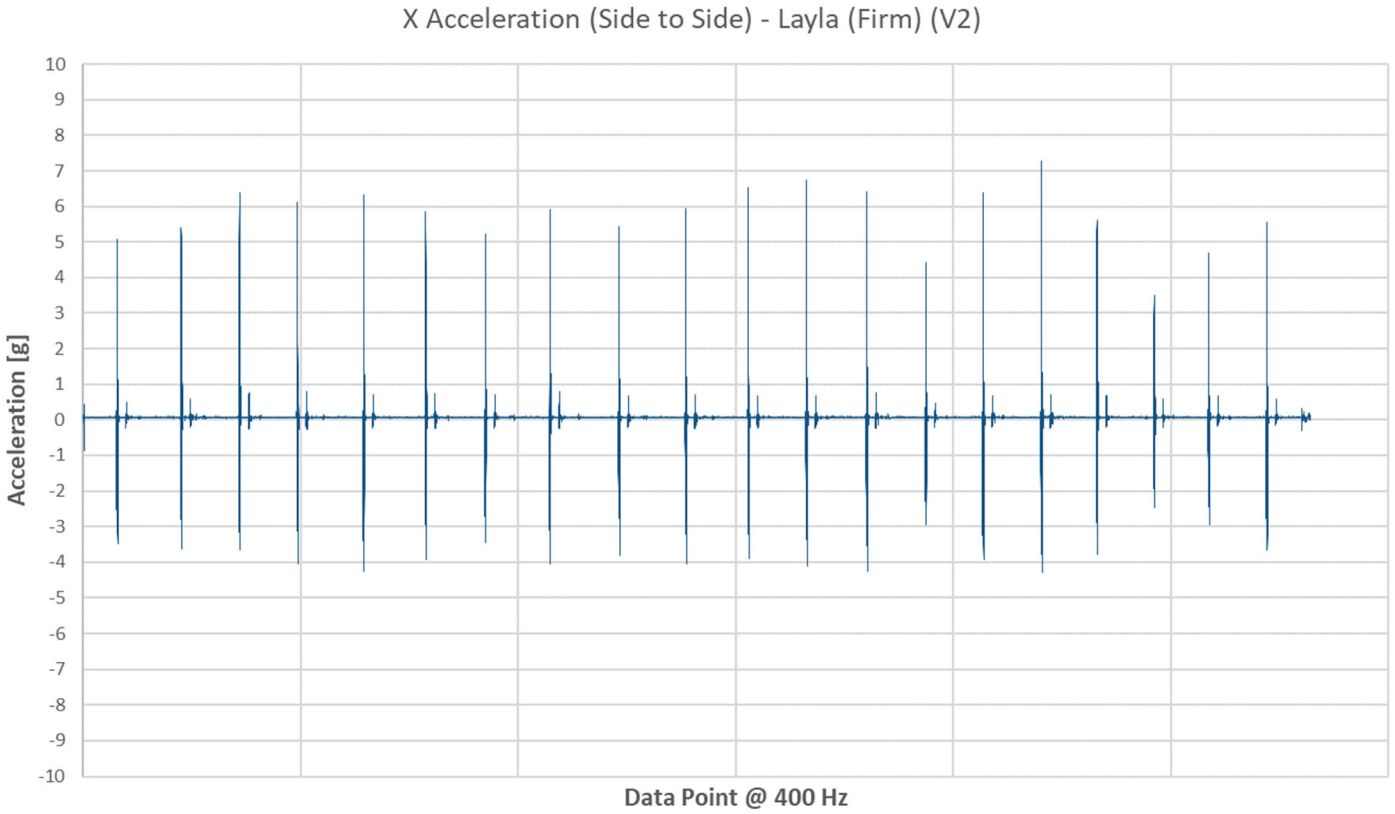


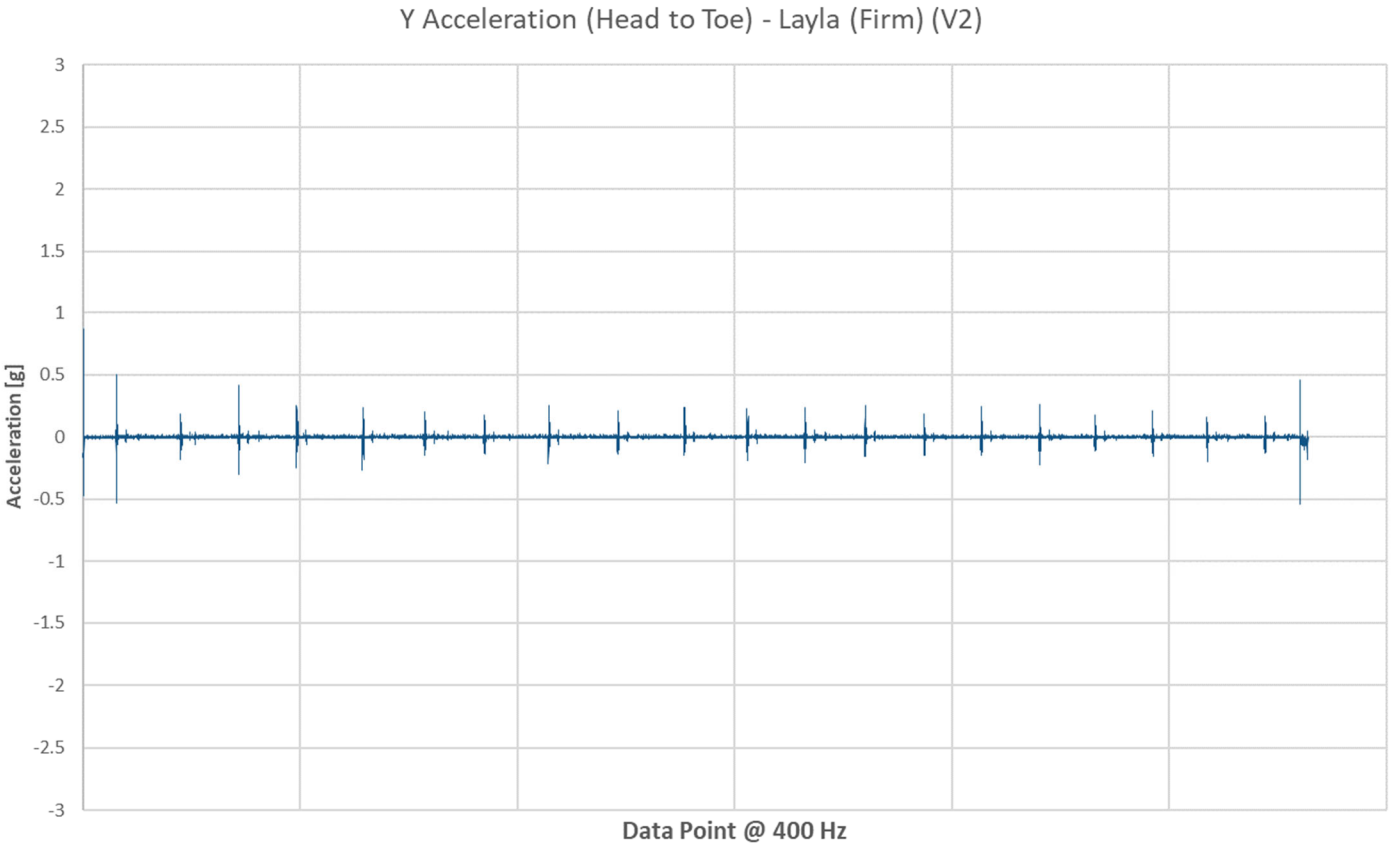

Y Acceleration (Head to Toe) - GhostBed Luxe
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

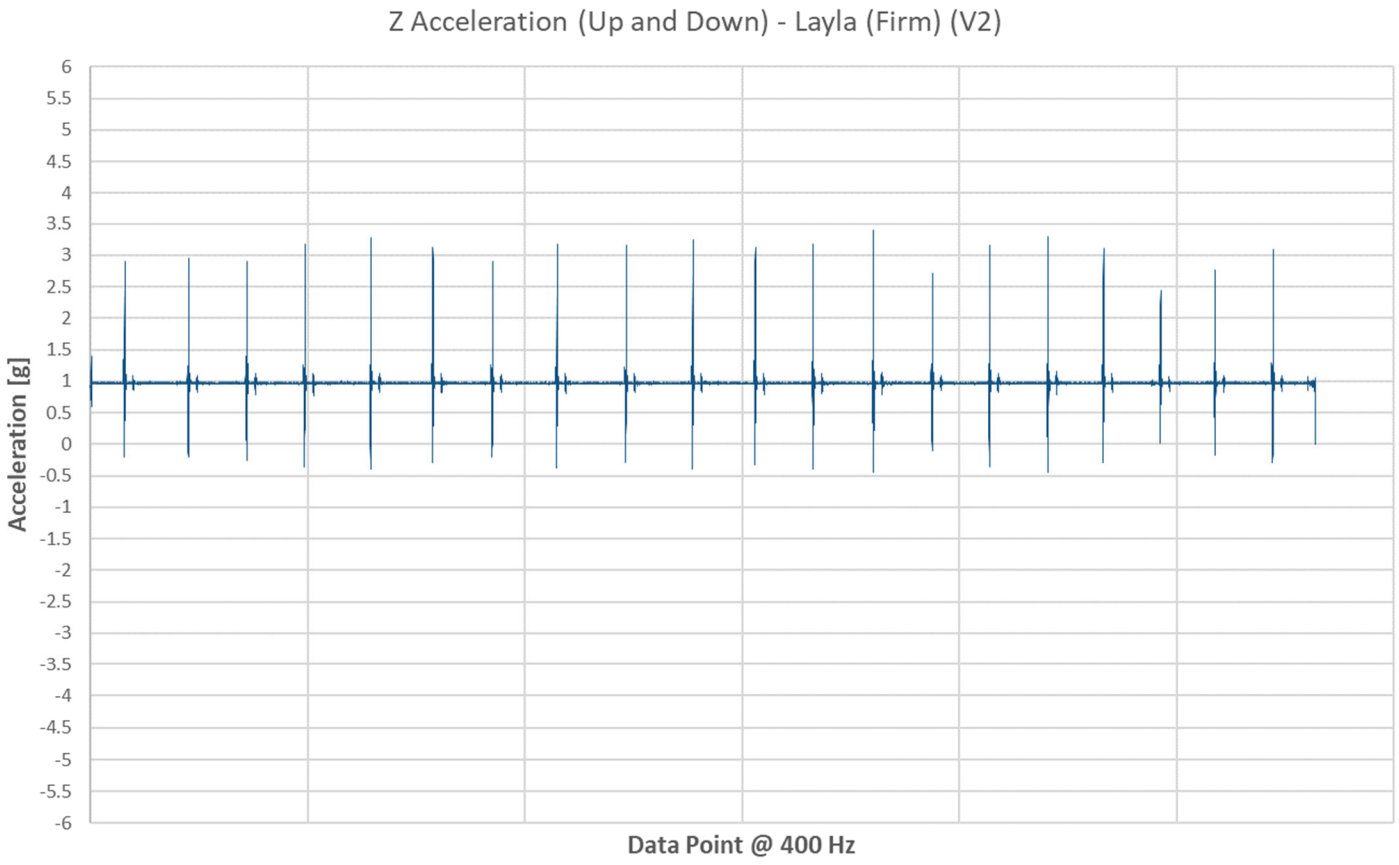

Z Acceleration (Up and Down) - GhostBed Luxe
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – LAYLA (FIRM) (V2)

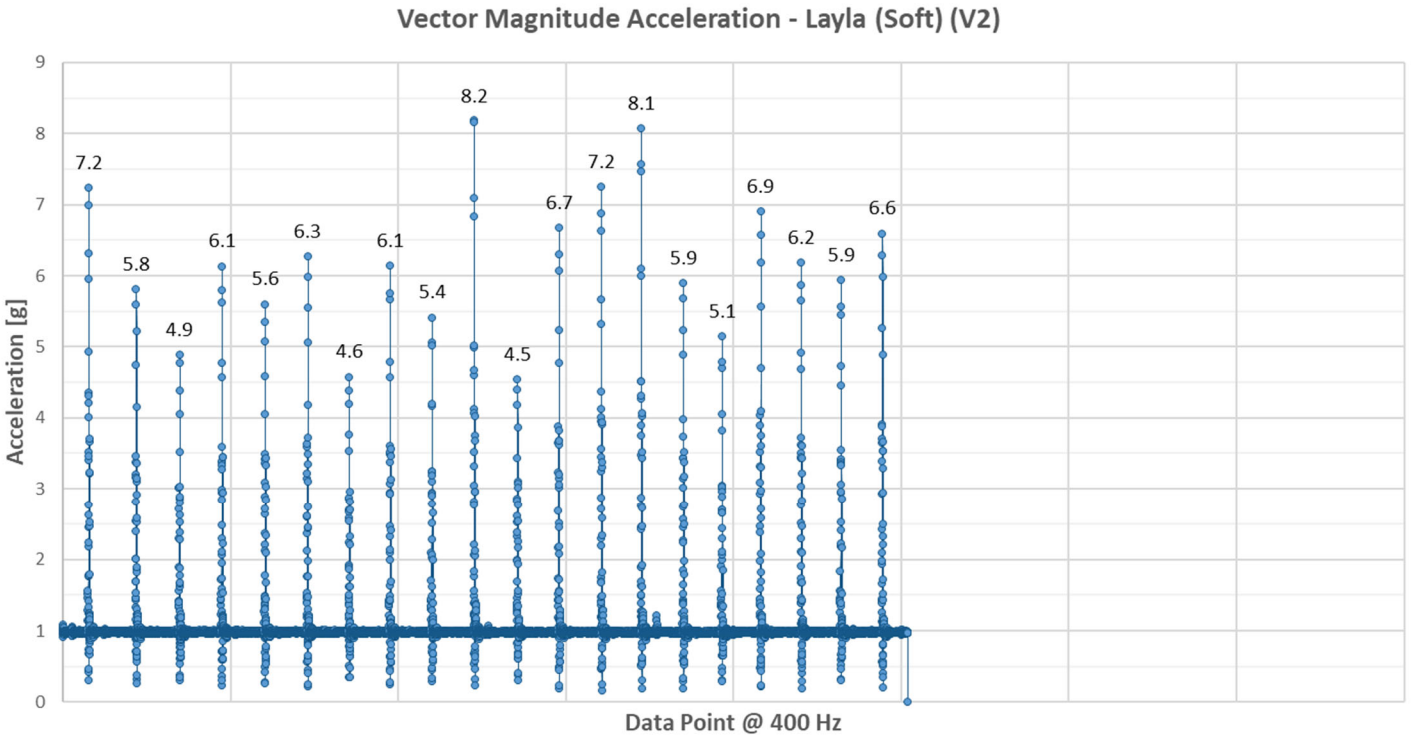


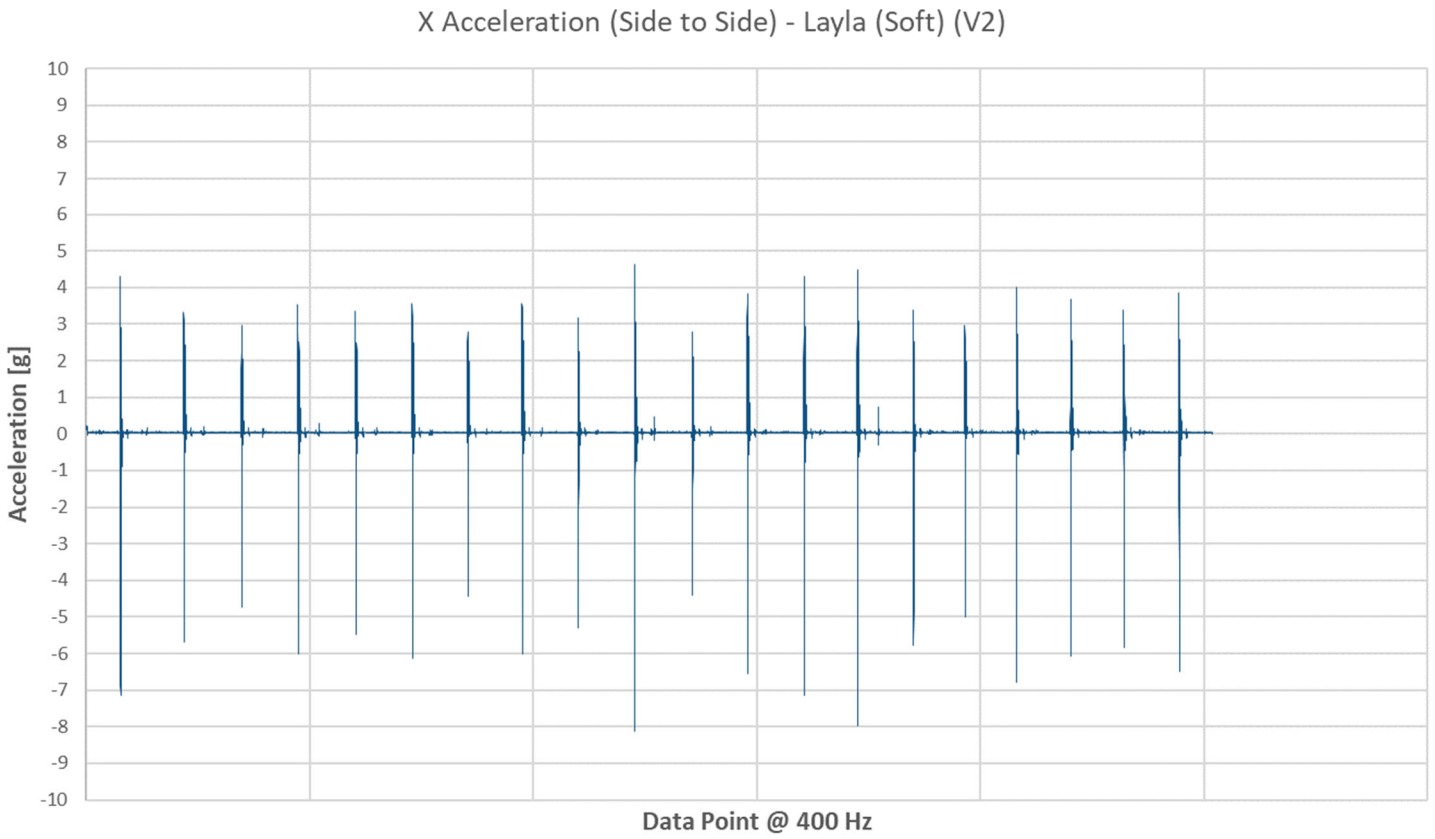


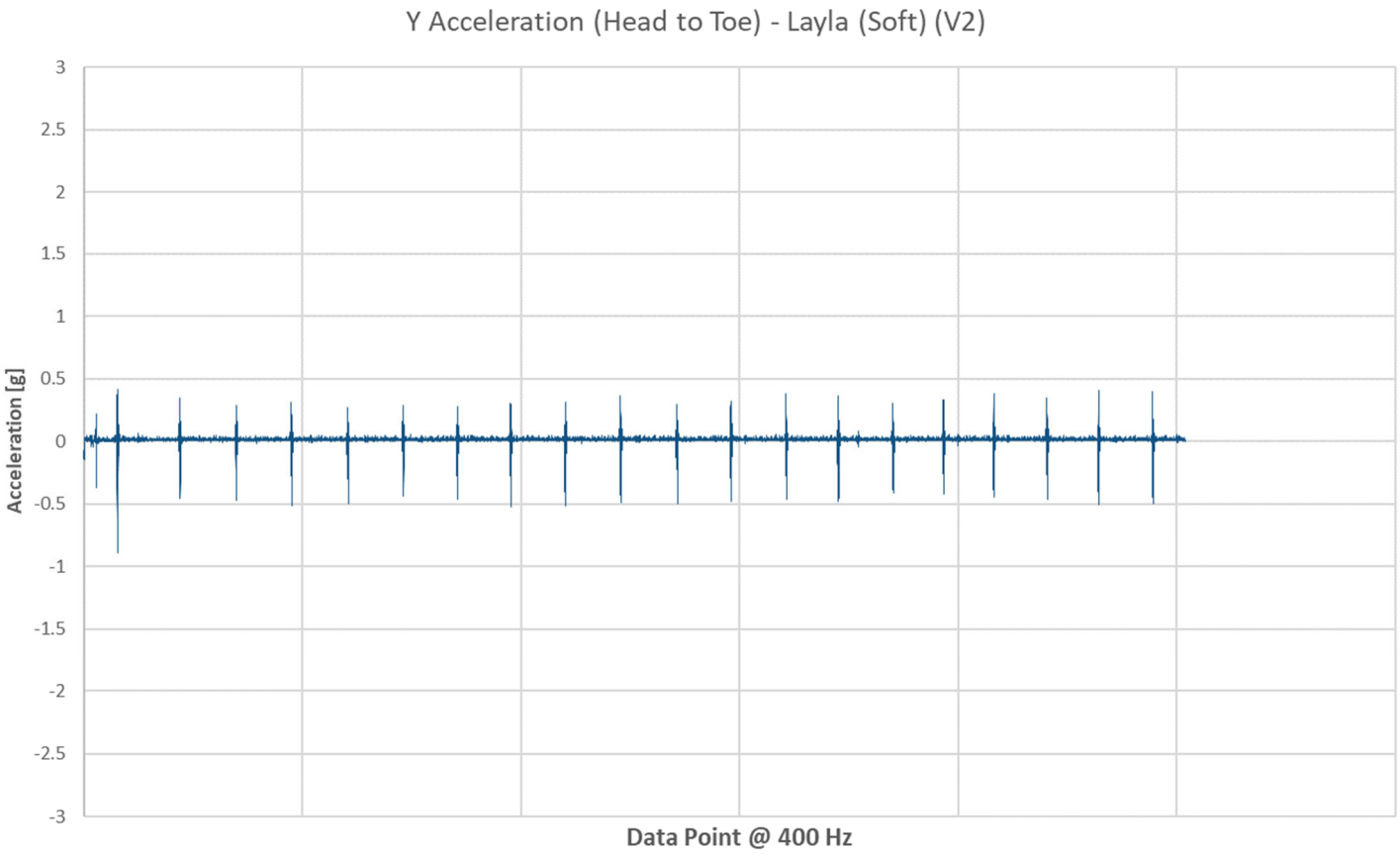

Y Acceleration (Head to Toe) - Layla (Firm) (V2)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

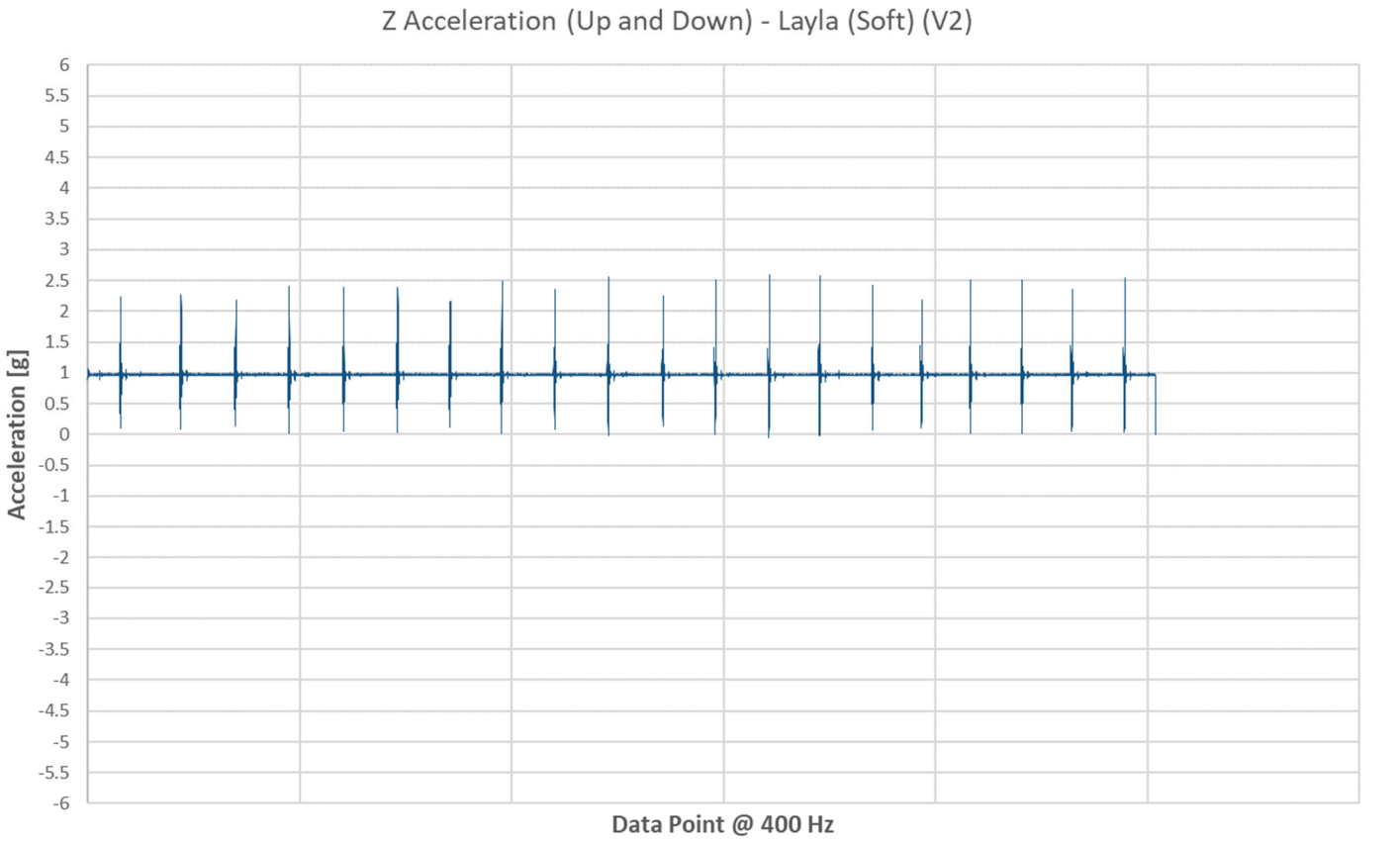

Z Acceleration (Up and Down) - Layla (Firm) (V2)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – LAYLA (SOFT) (V2)

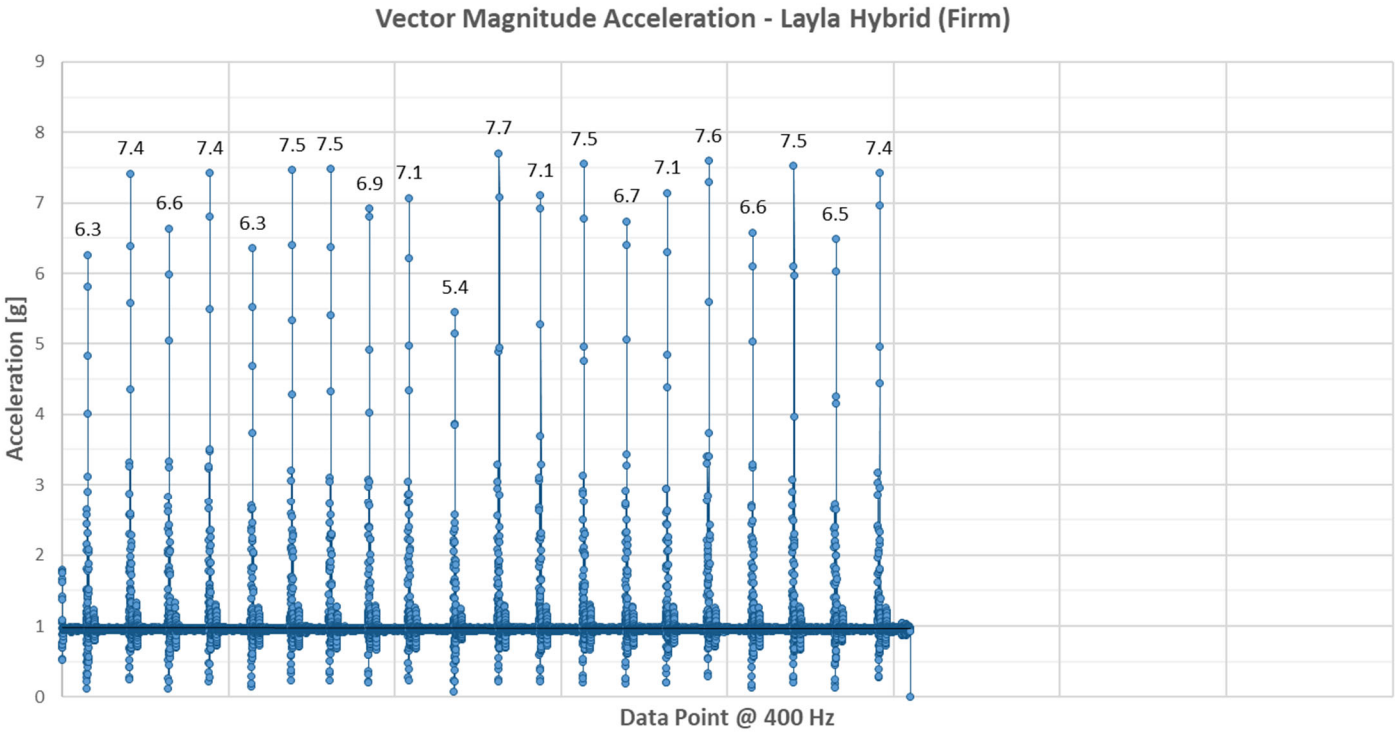


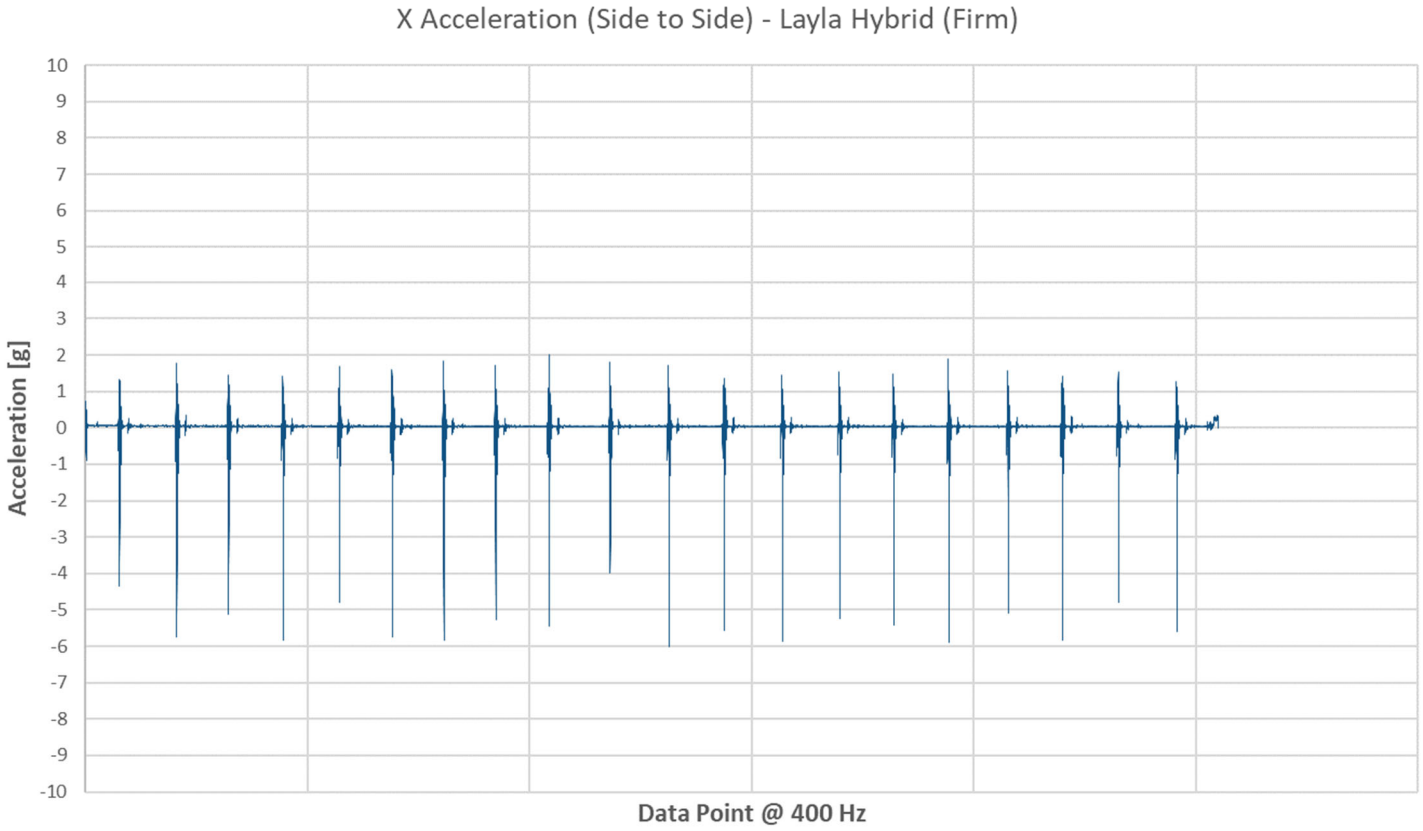


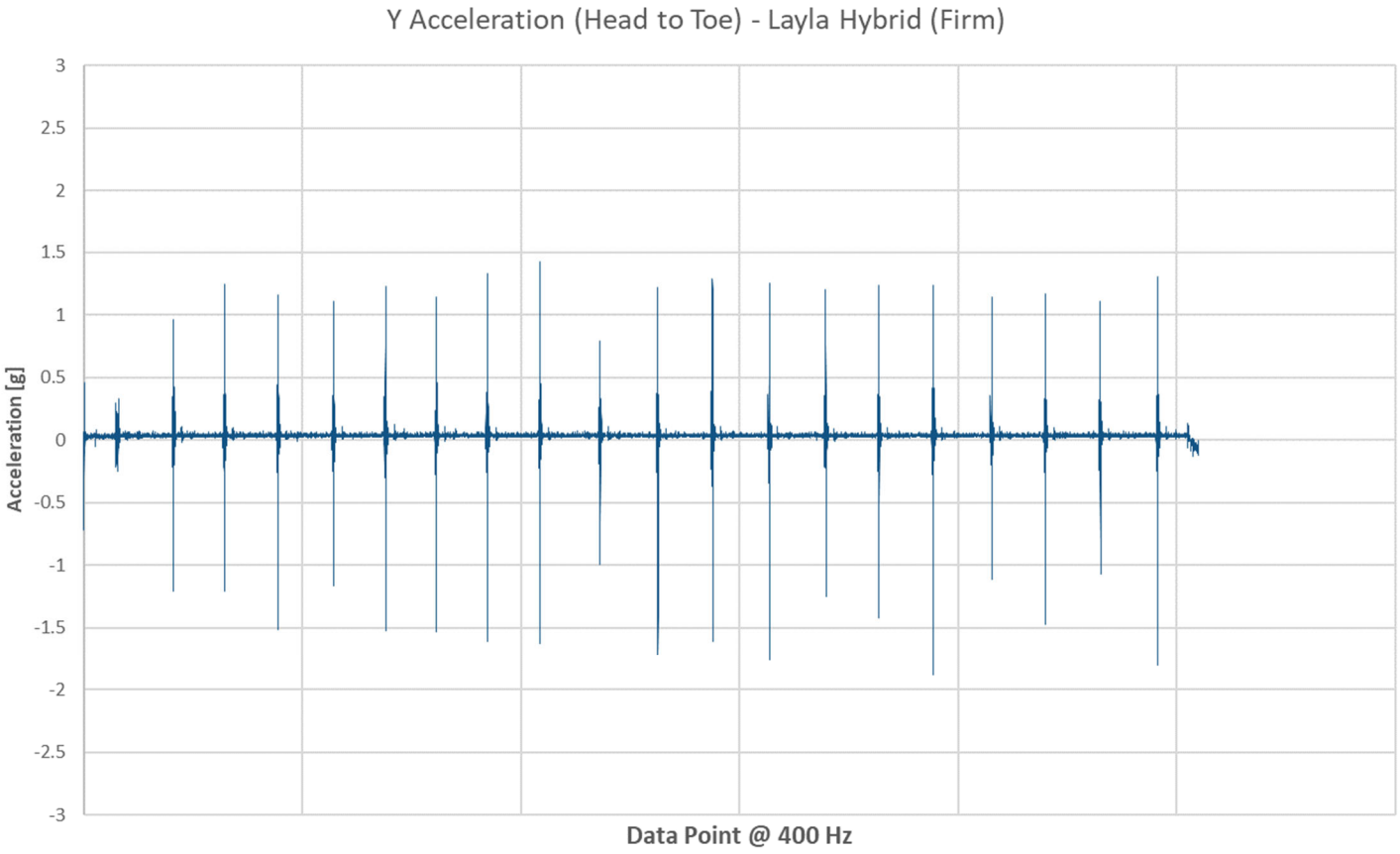

Y Acceleration (Head to Toe) - Layla (Soft) (V2)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

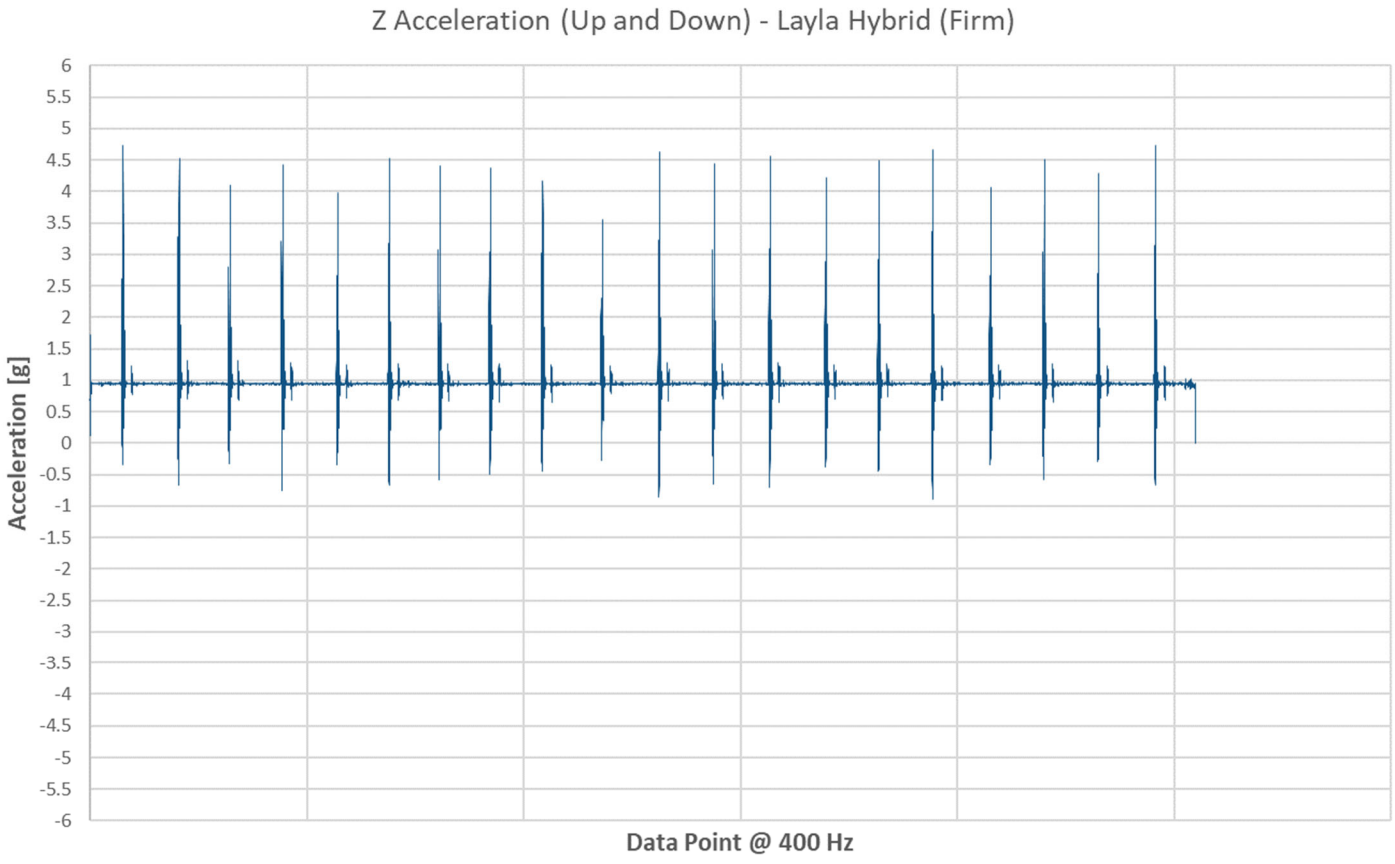

Z Acceleration (Up and Down) - Layla (Soft) (V2)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – LAYLA HYBRID (FIRM)

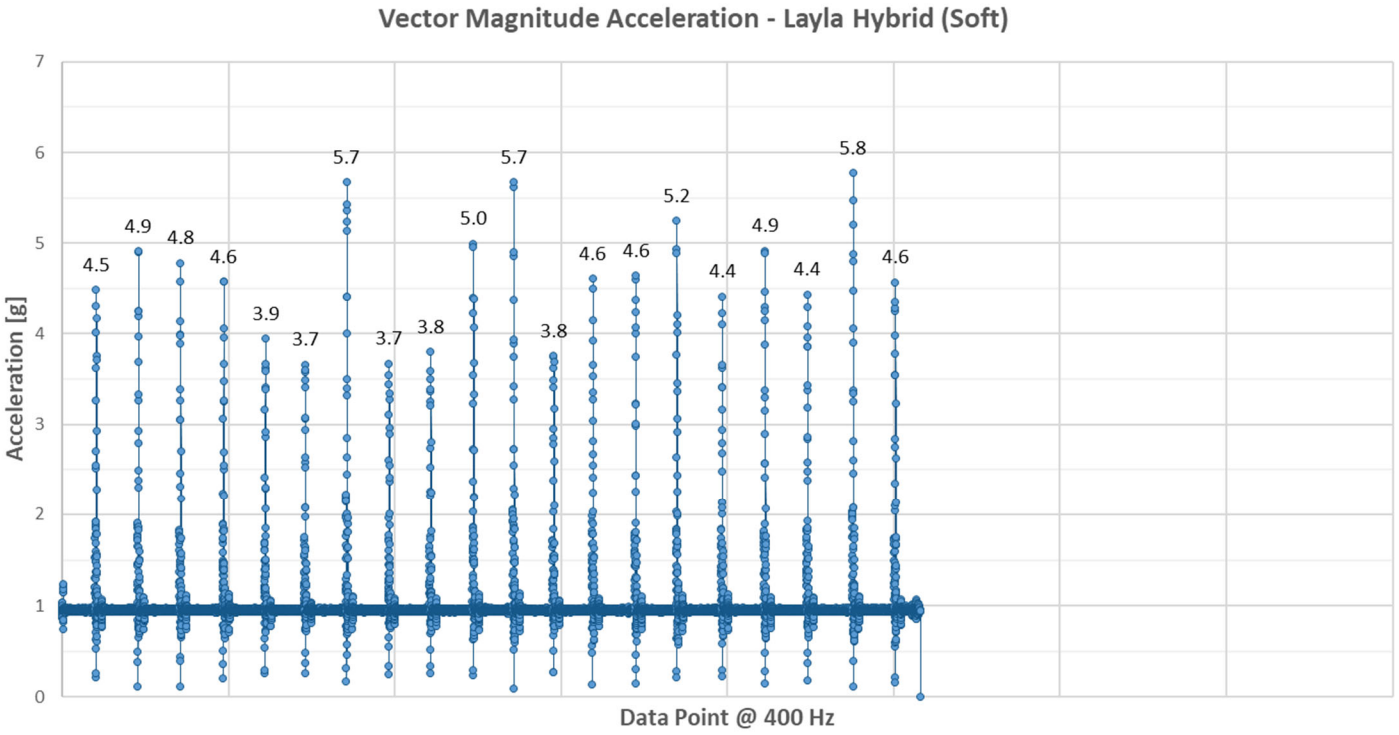


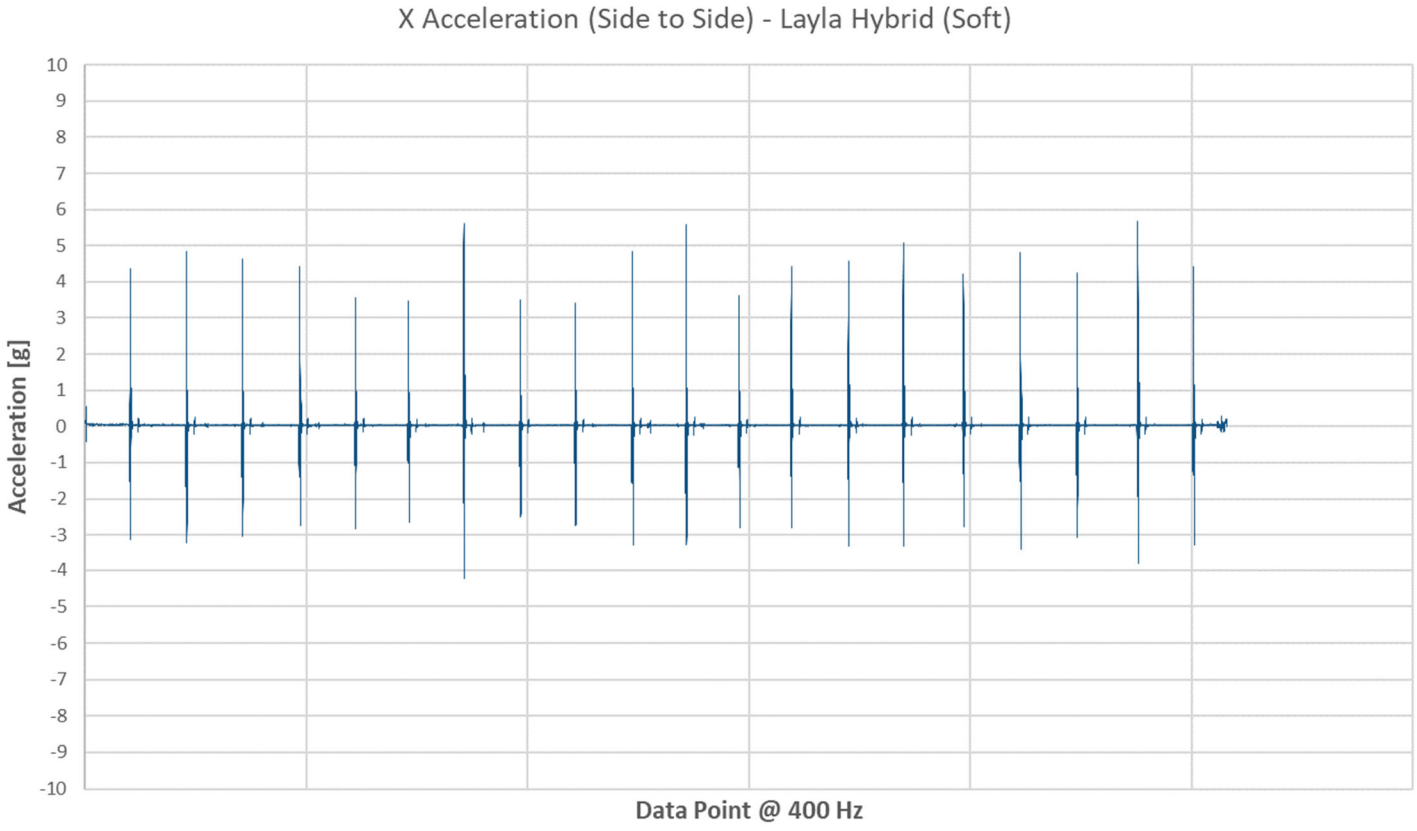


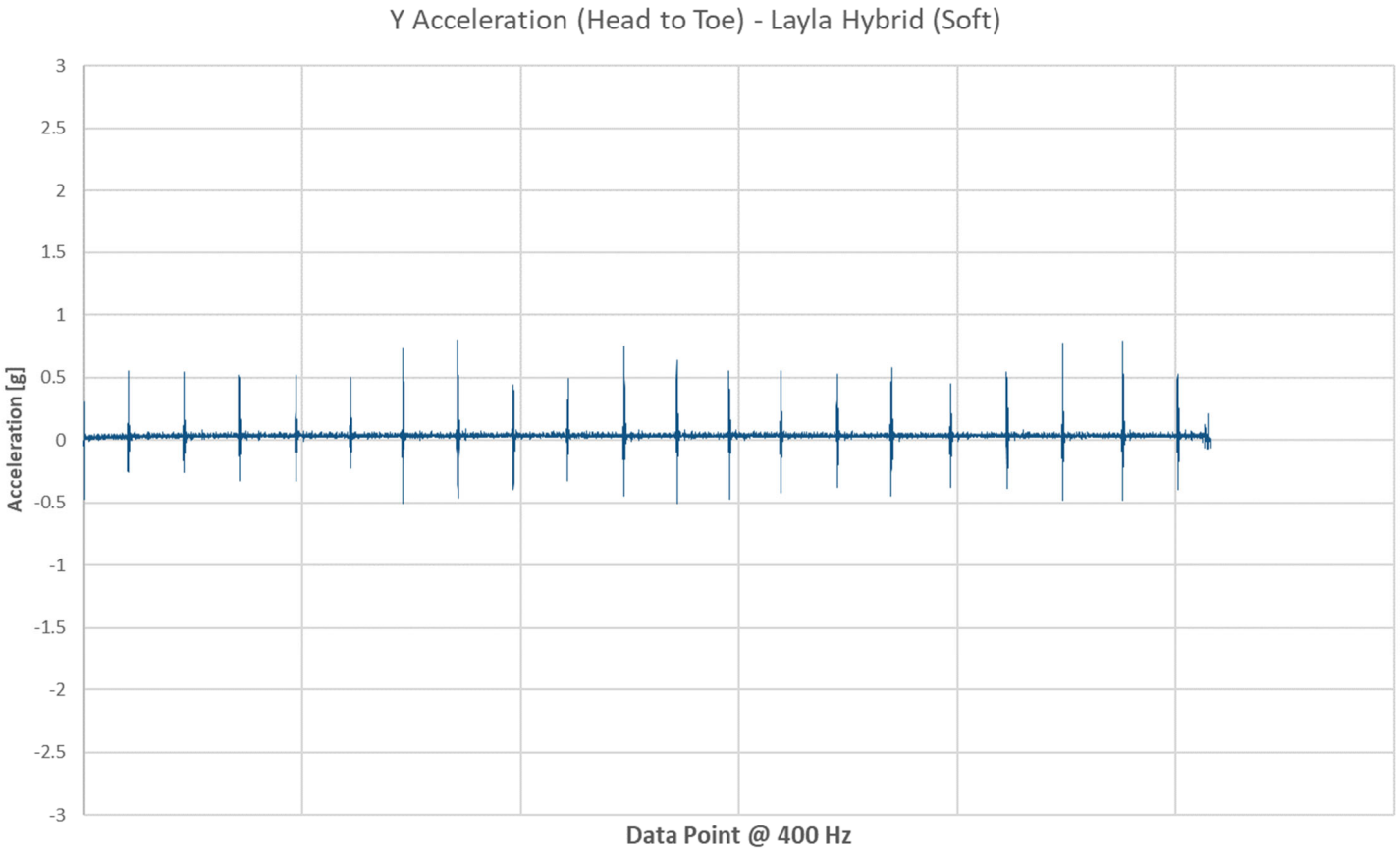

Y Acceleration (Head to Toe) - Layla Hybrid (Firm)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

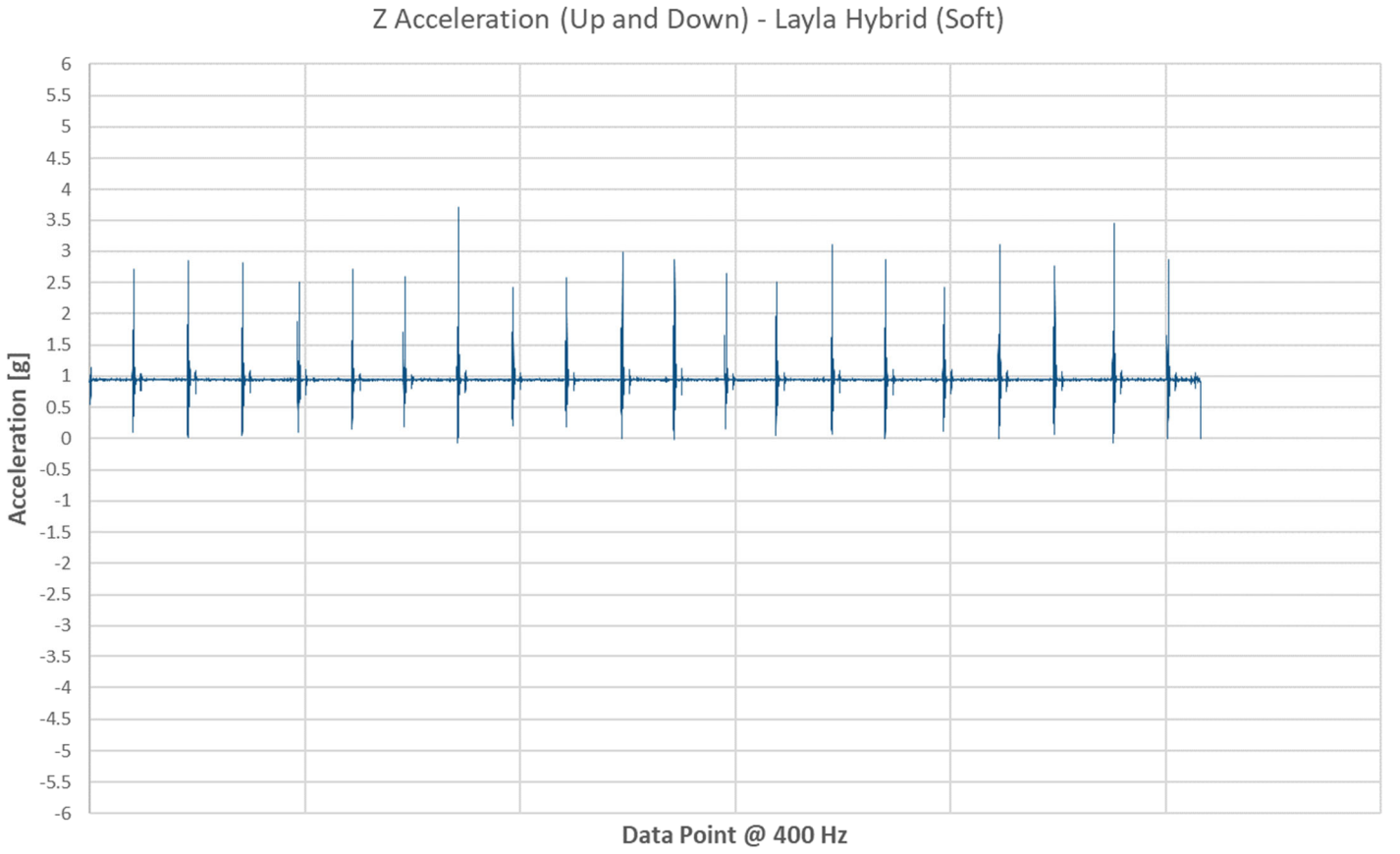

Z Acceleration (Up and Down) - Layla Hybrid (Firm)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 – LAYLA HYBRID (SOFT)

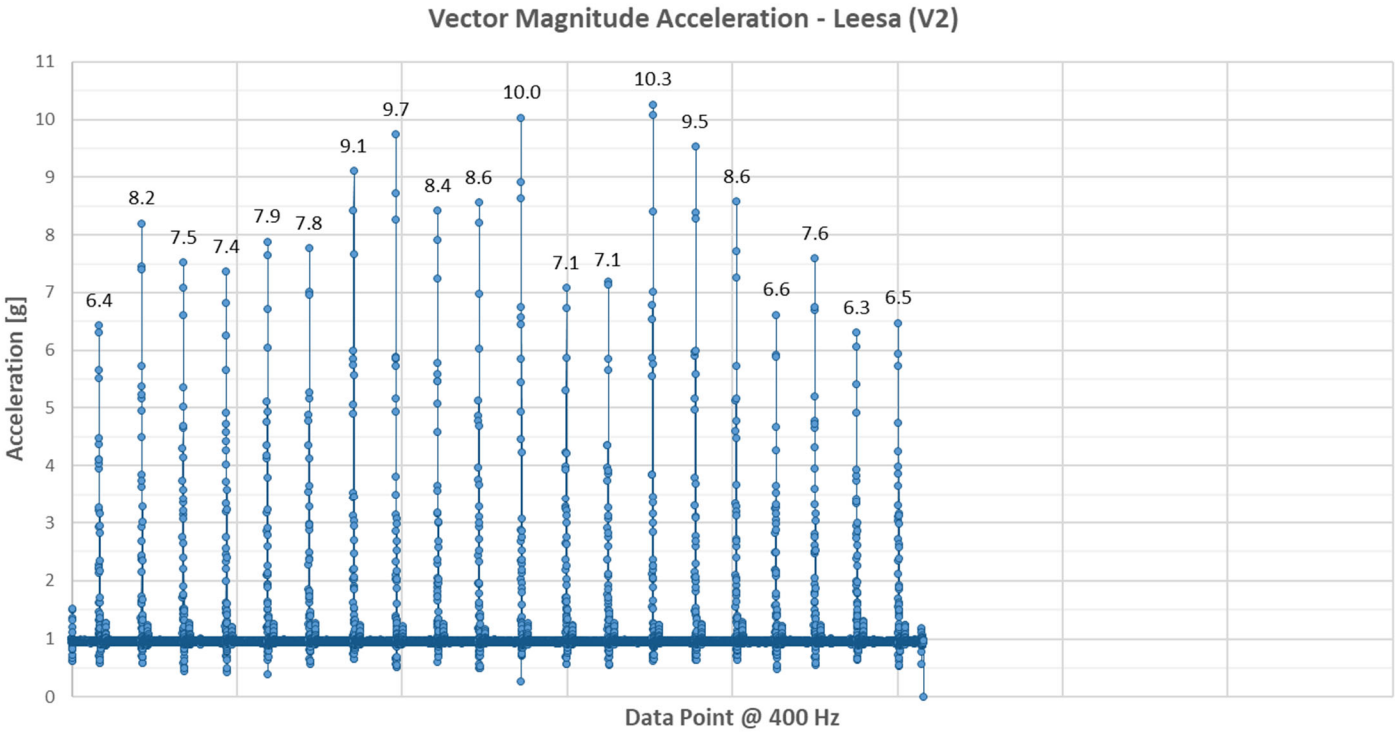


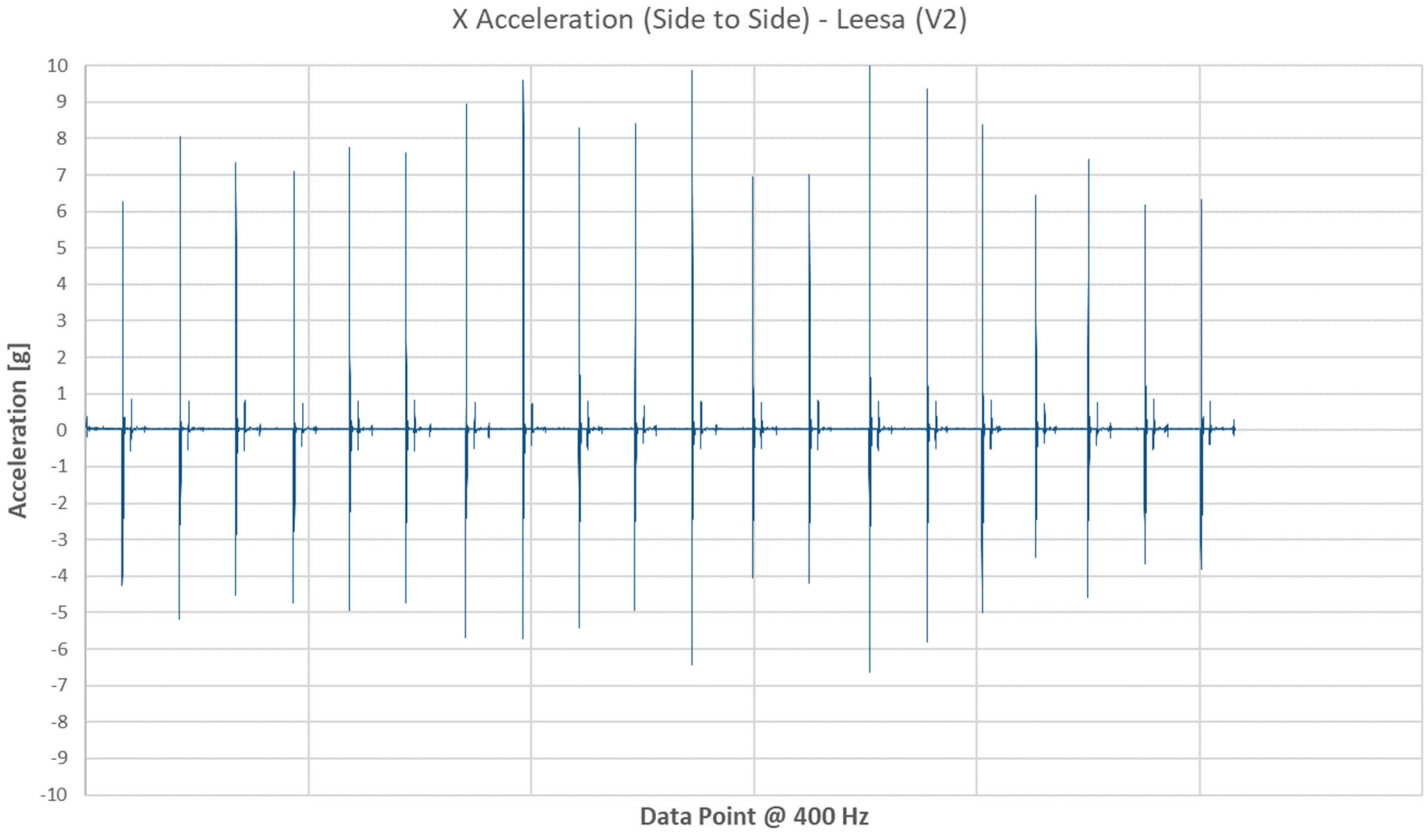


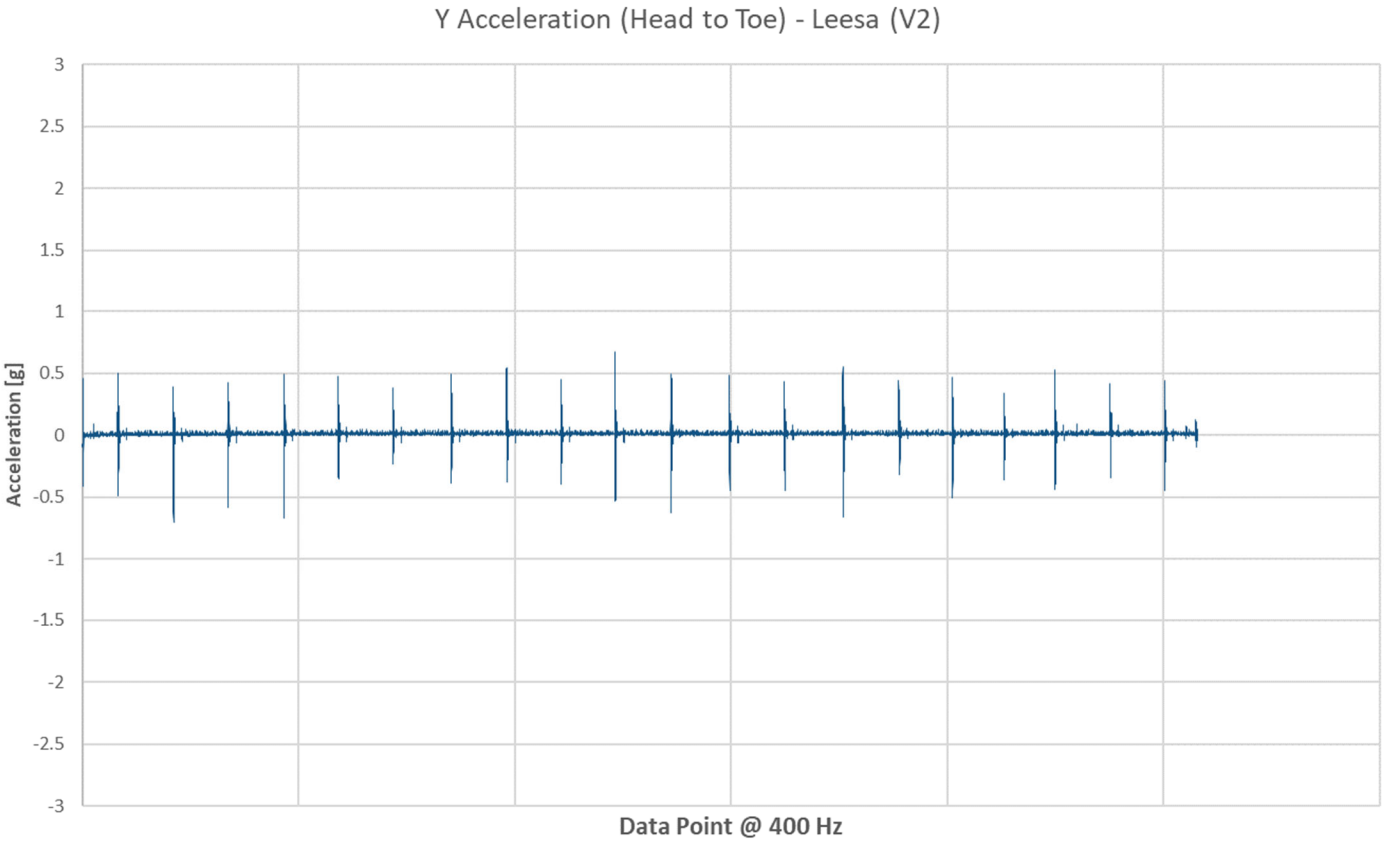

Y Acceleration (Head to Toe) - Layla Hybrid (Soft)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

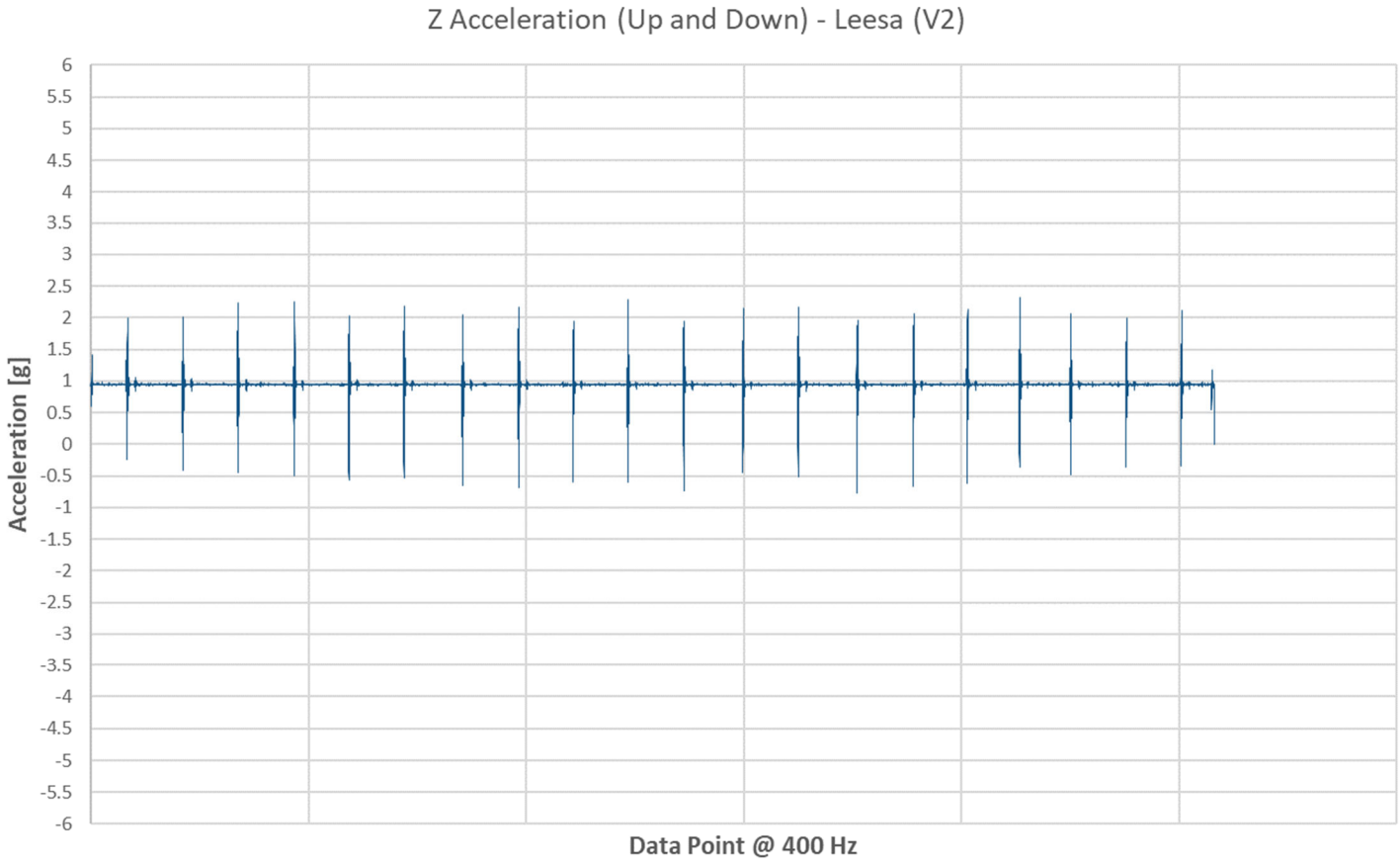

Z Acceleration (Up and Down) - Layla Hybrid (Soft)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 –LEESA (V2)

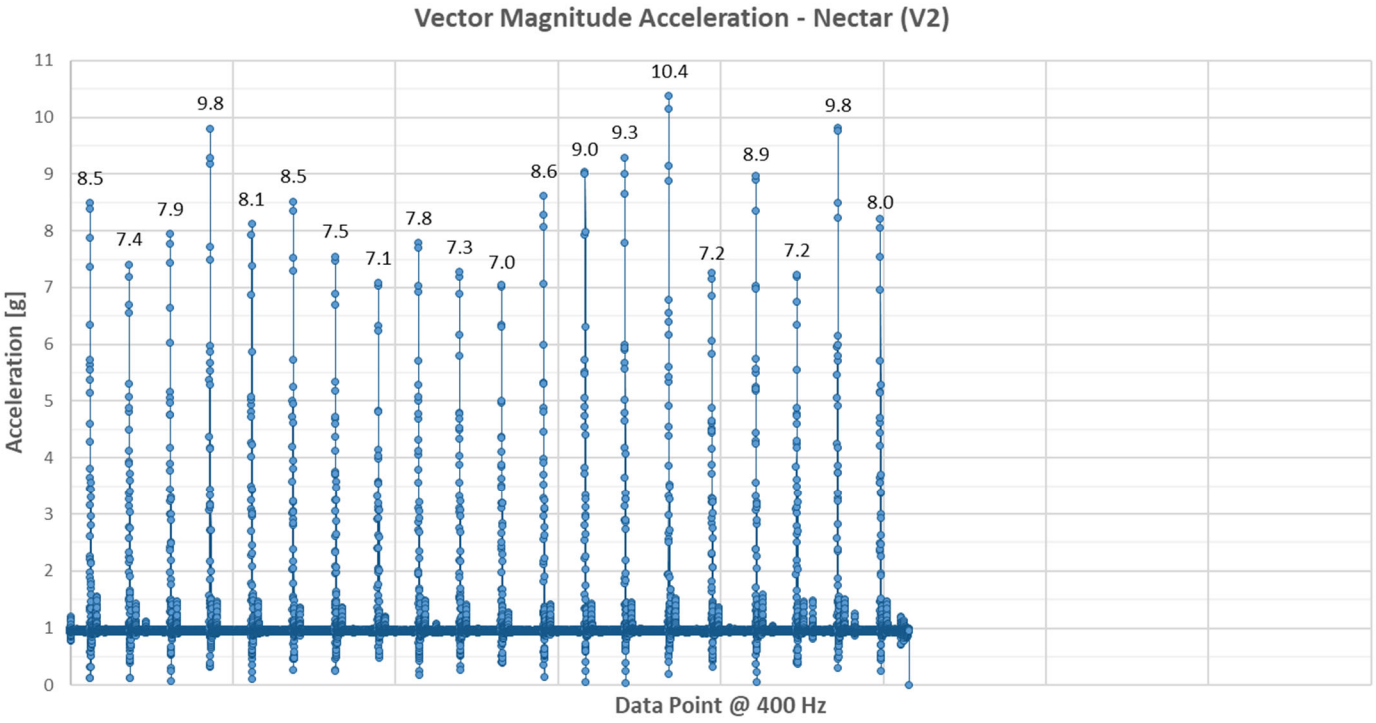


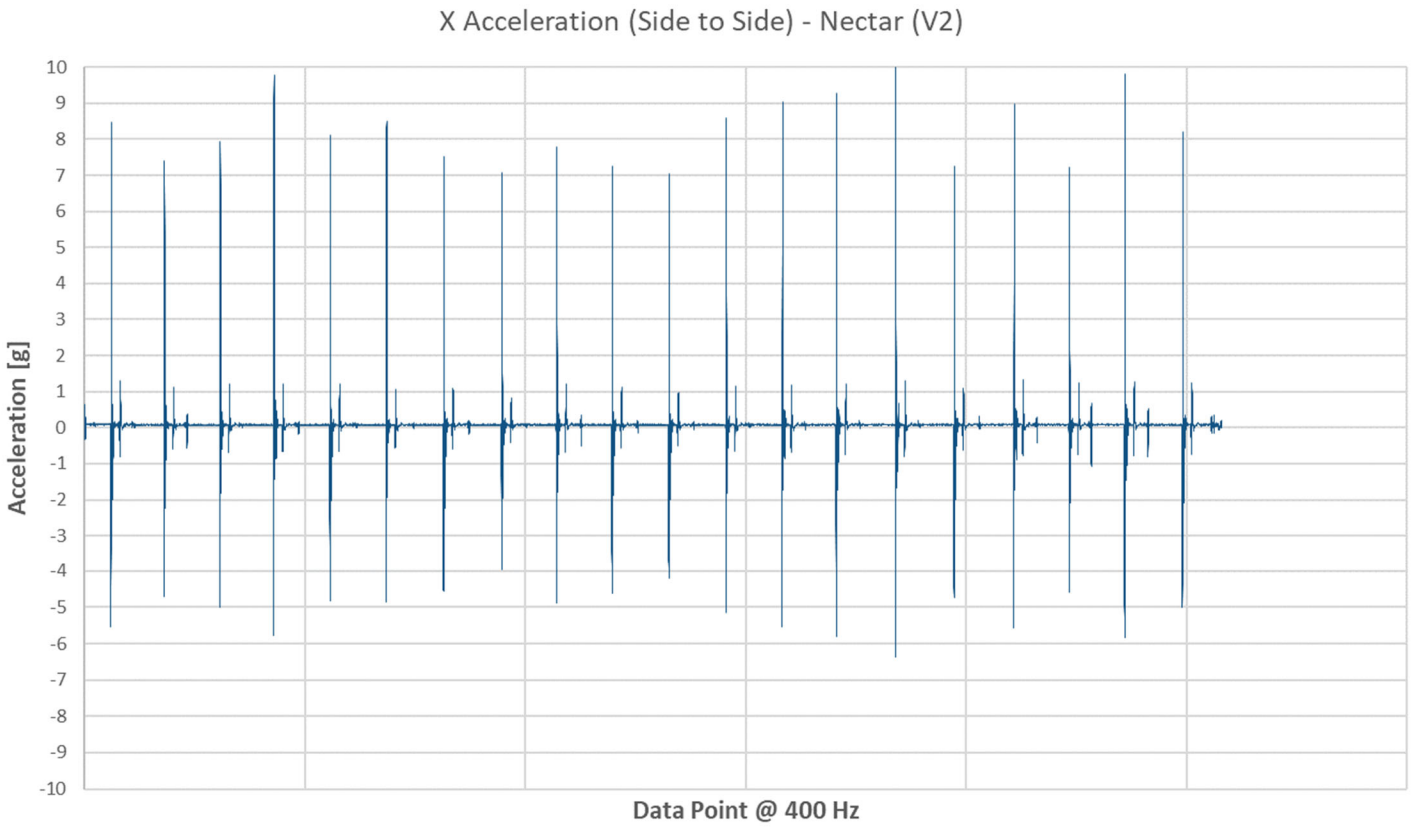


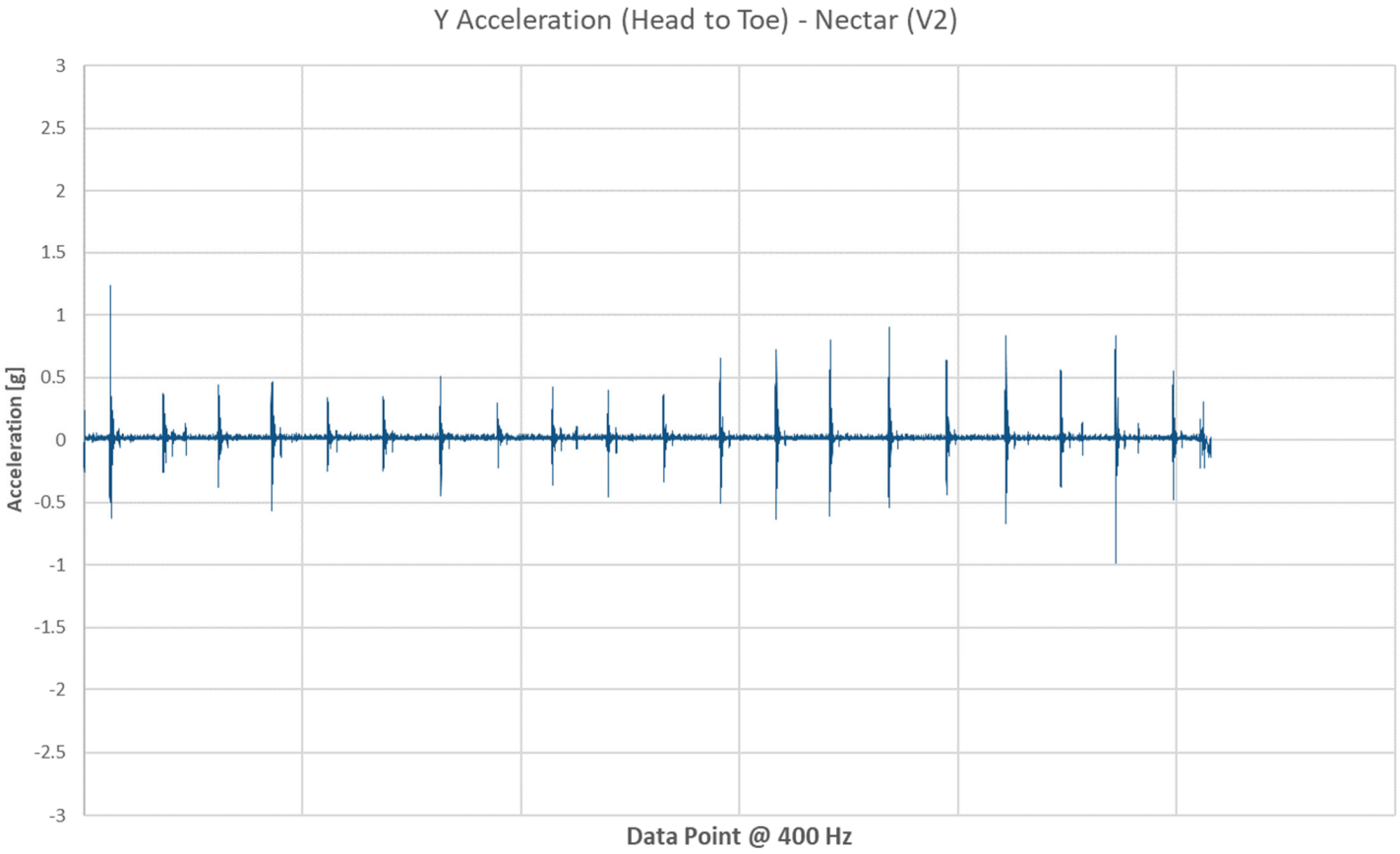

Y Acceleration (Head to Toe) - Leesa (V2)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

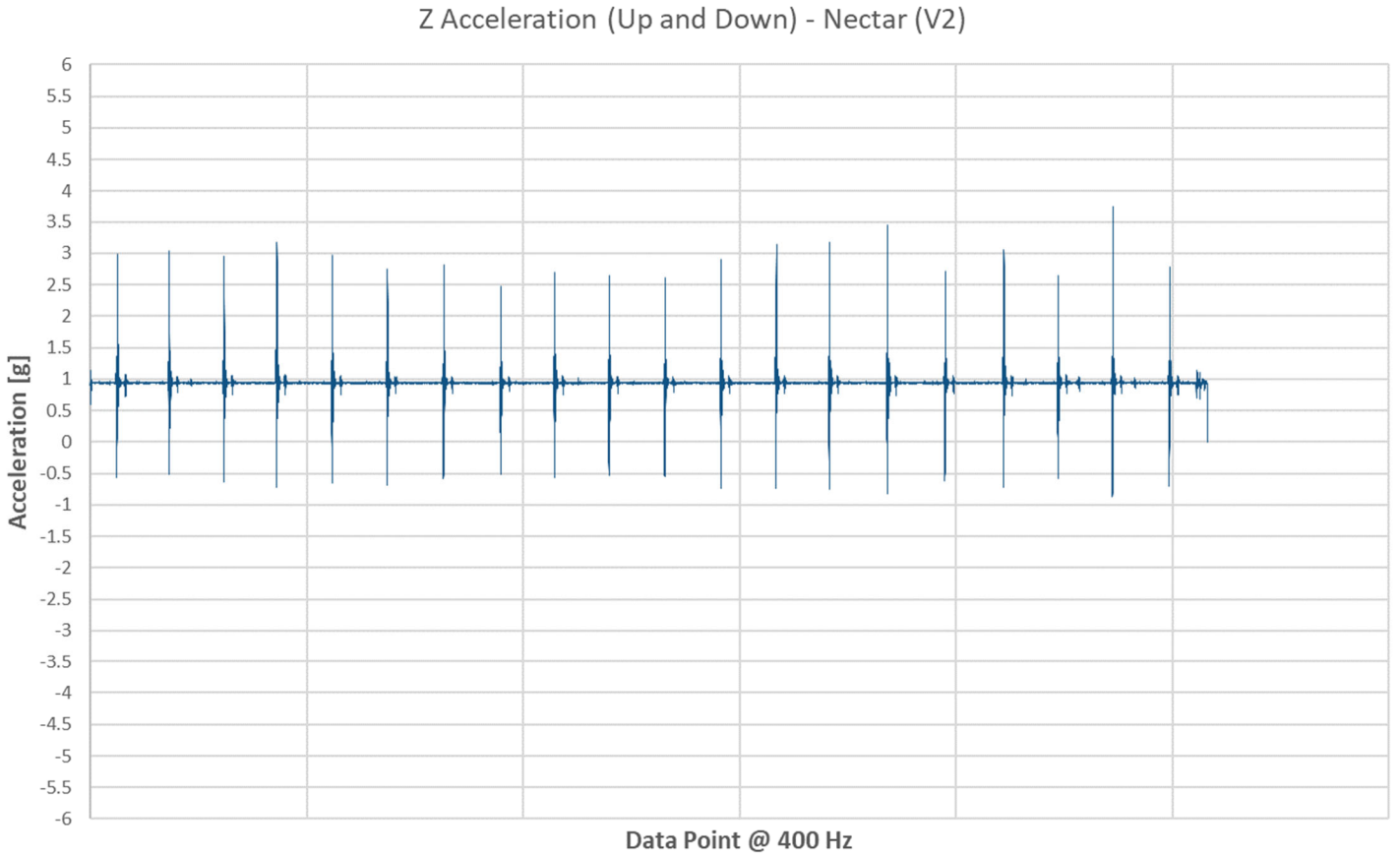

Z Acceleration (Up and Down) - Leesa (V2)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 –NECTAR (V2)

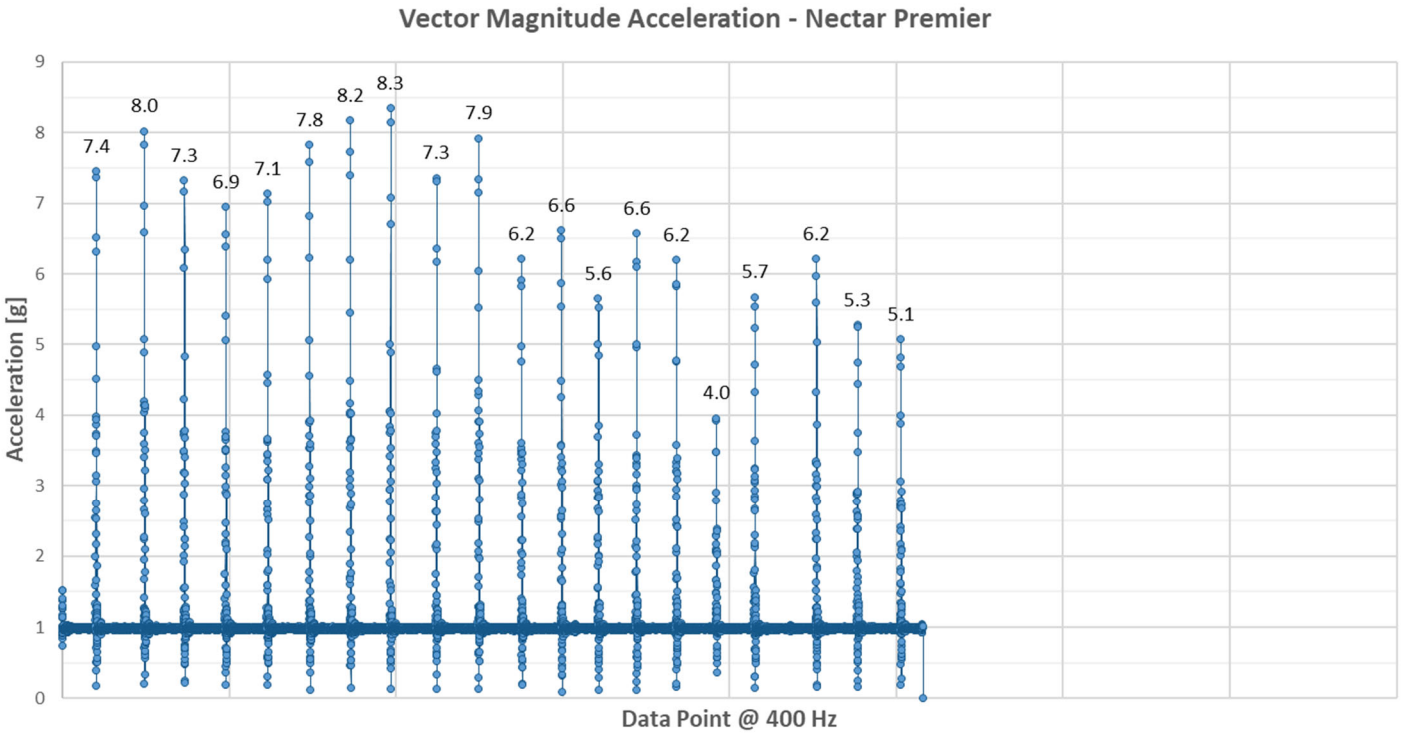


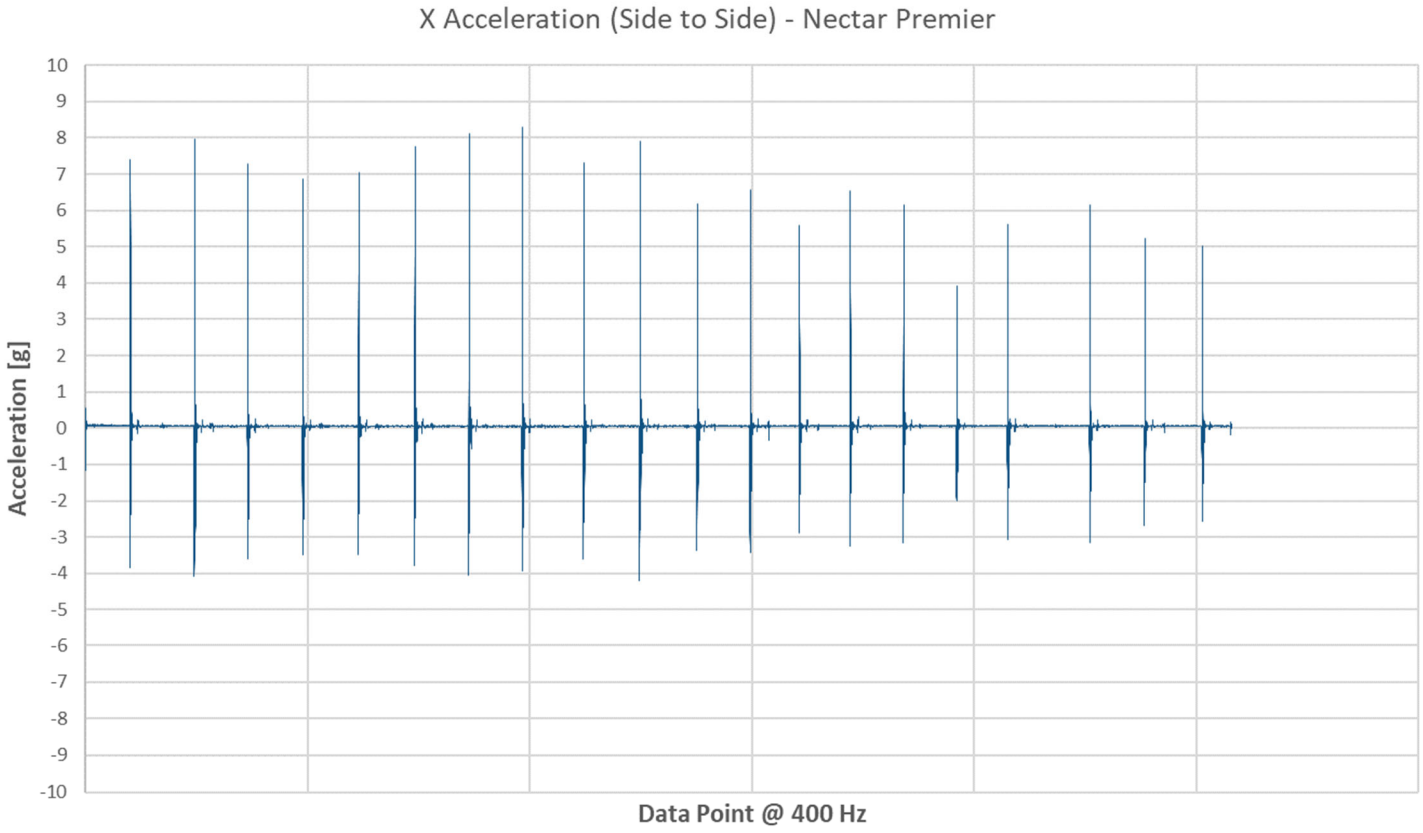


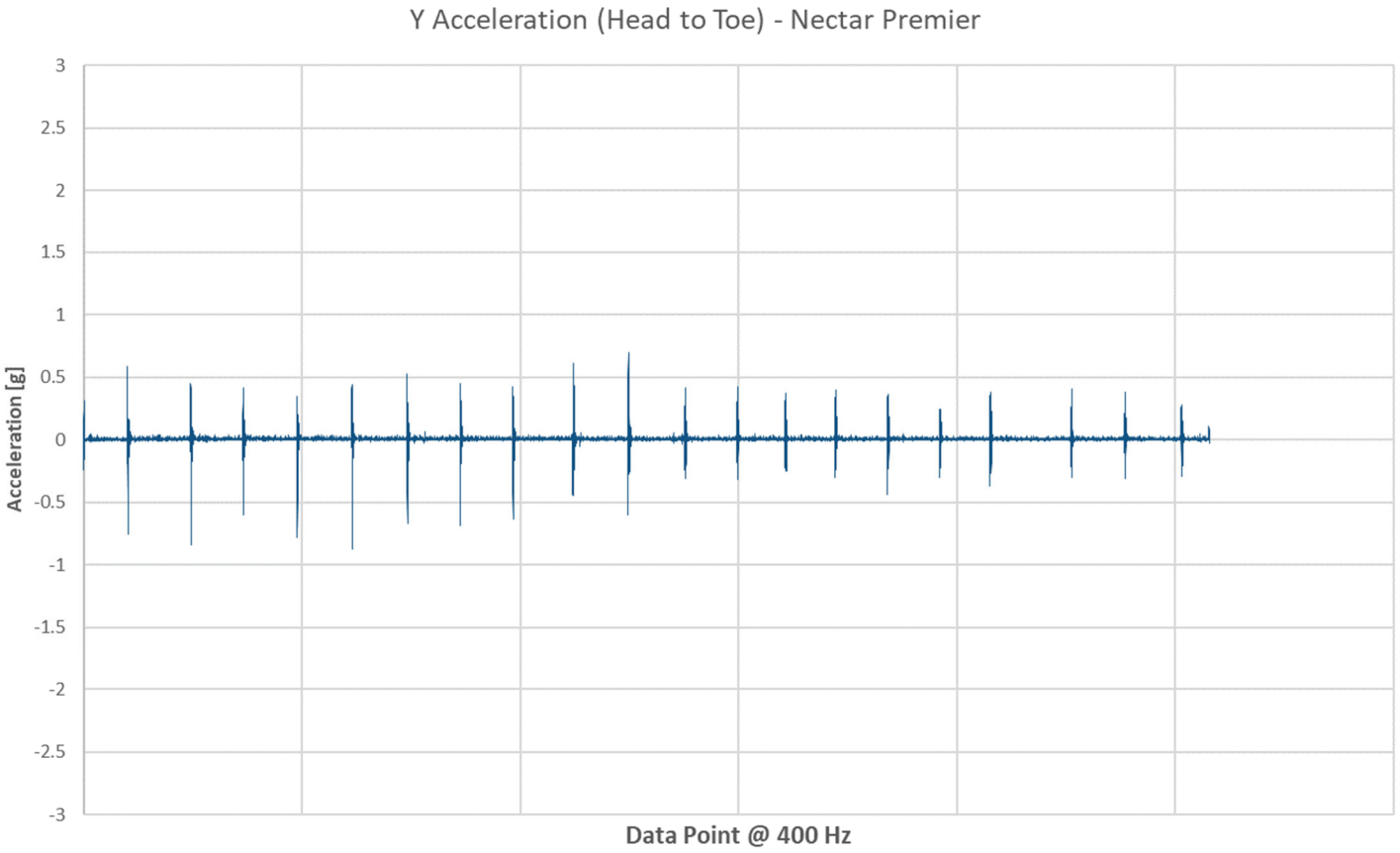

Y Acceleration (Head to Toe) - Nectar (V2)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

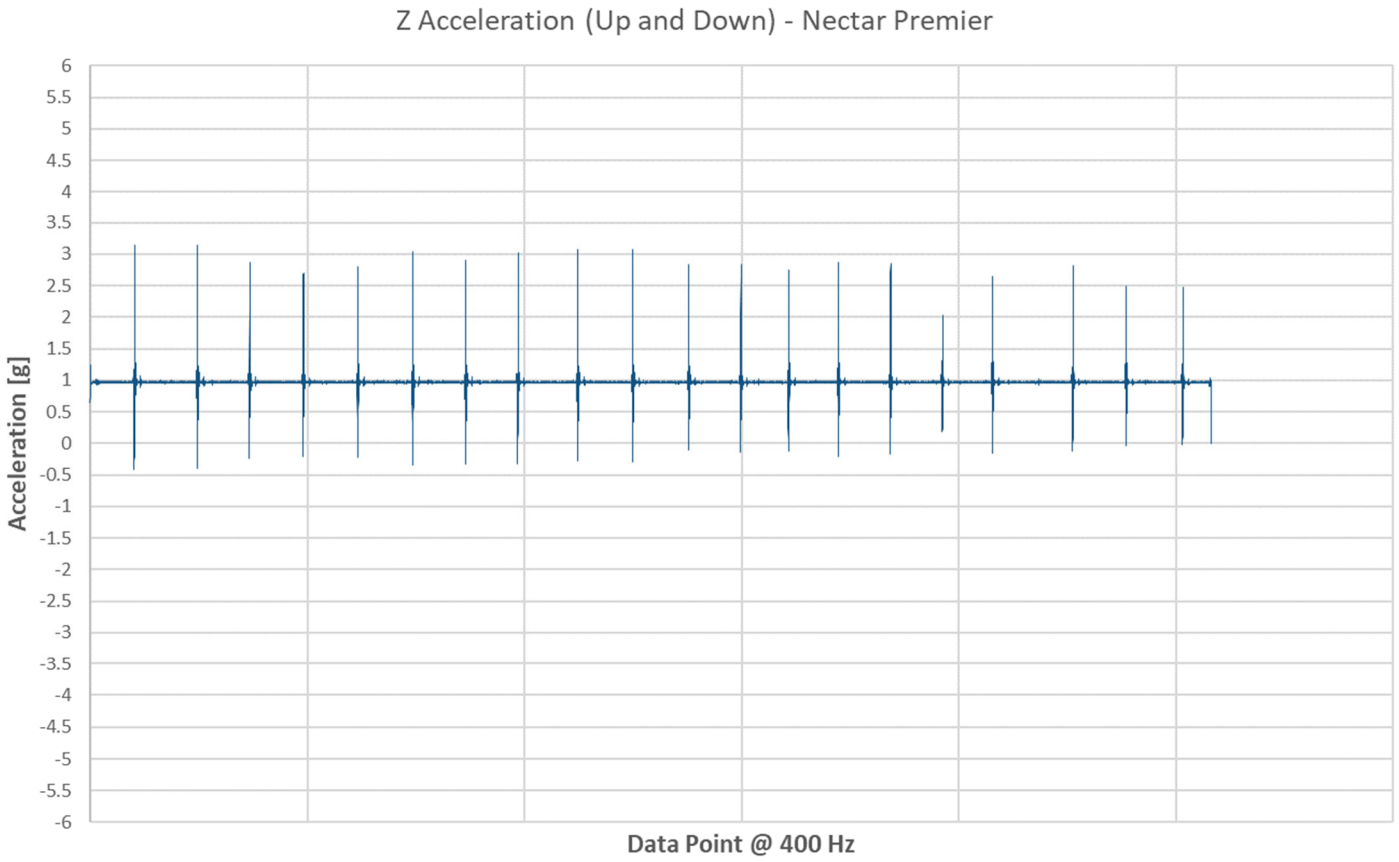

Z Acceleration (Up and Down) - Nectar (V2)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 –NECTAR PREMIER

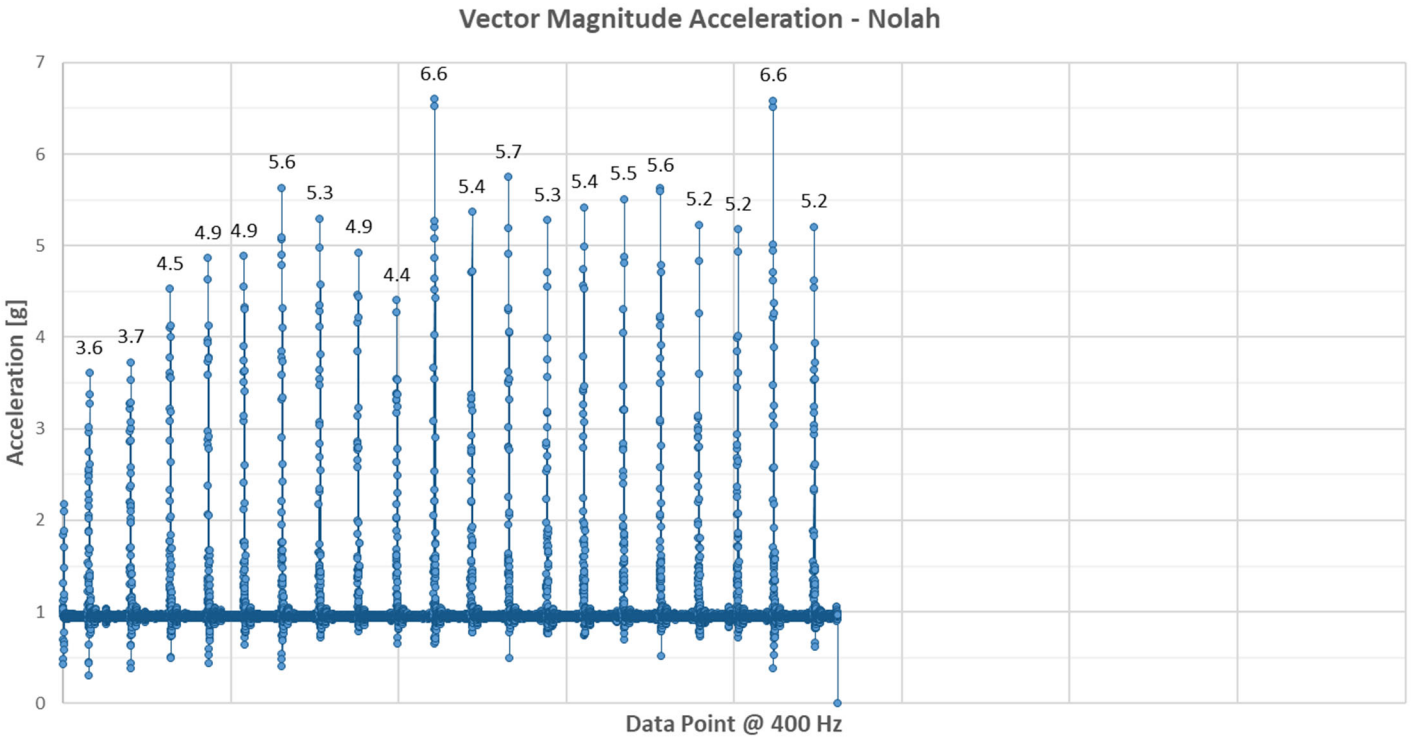


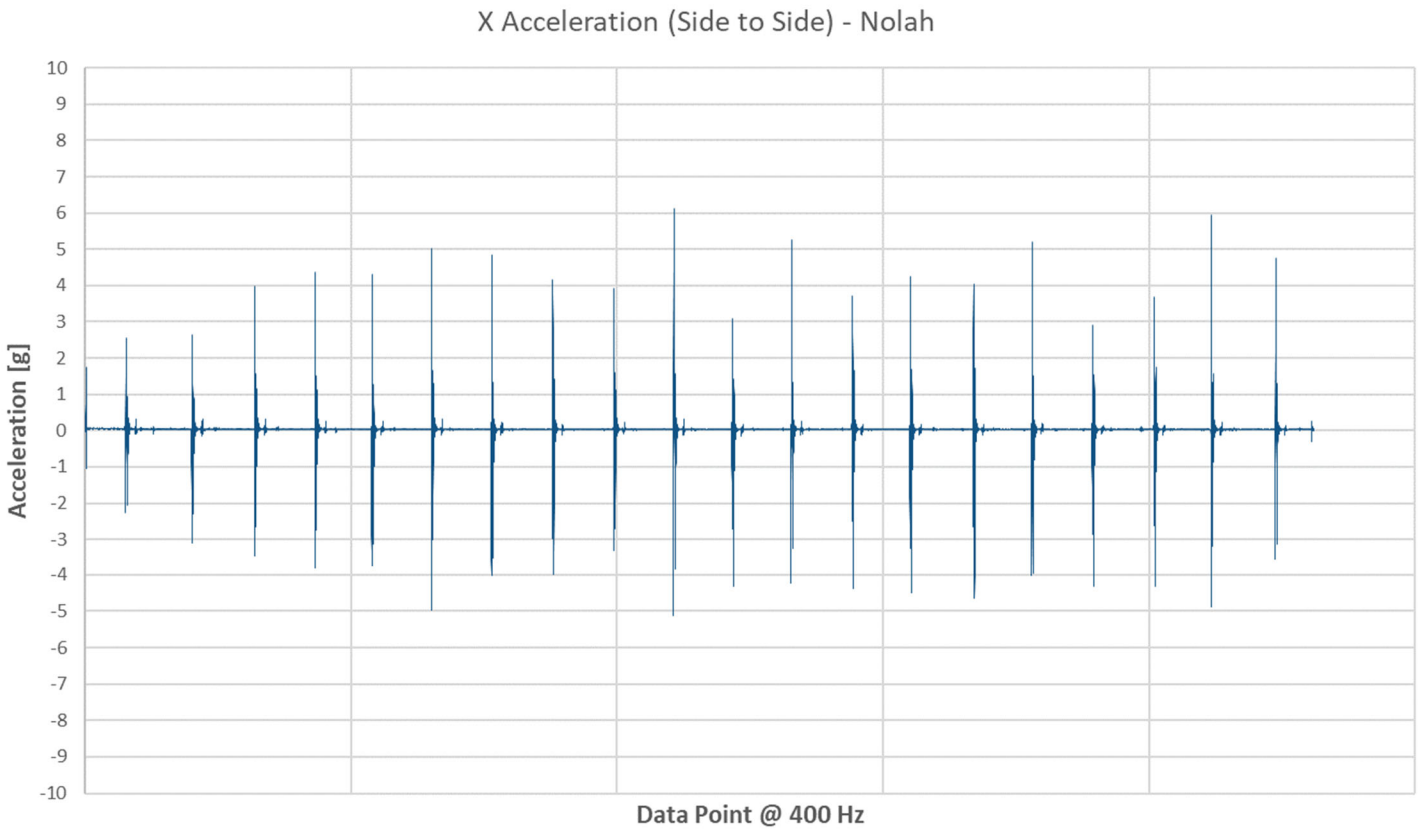


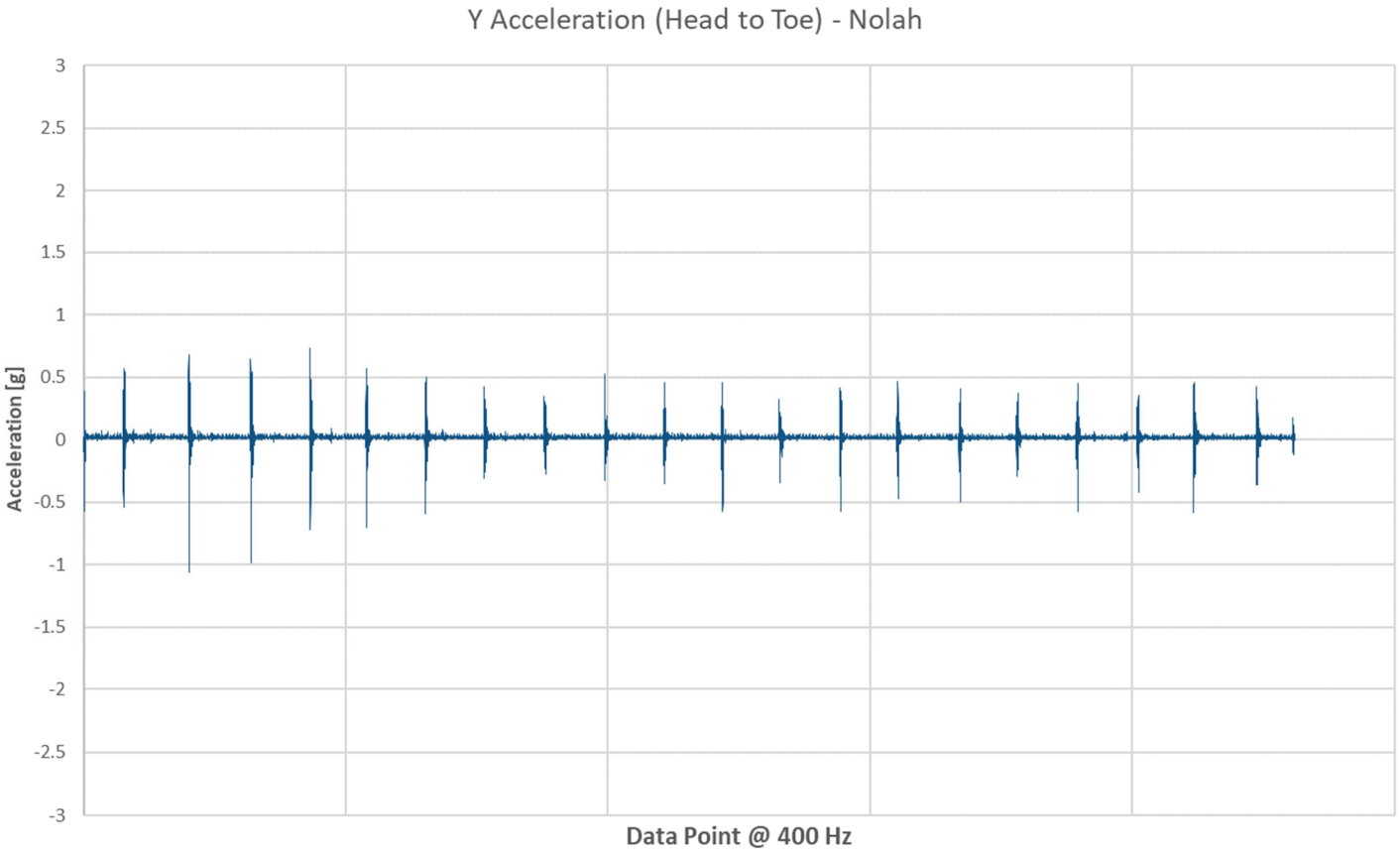

Y Acceleration (Head to Toe) - Nectar Premier
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

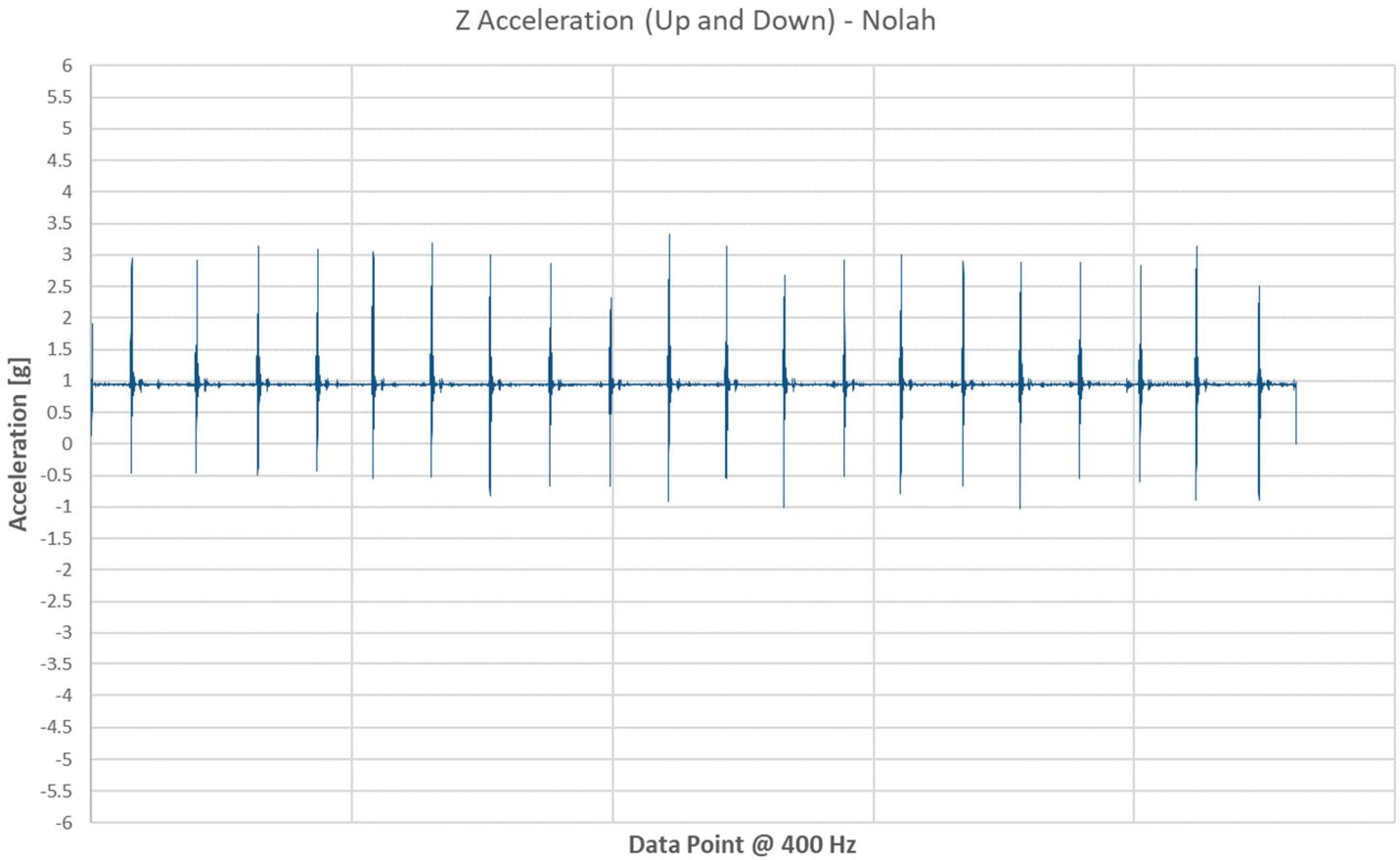

Z Acceleration (Up and Down) - Nectar Premier
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 –NOLAH

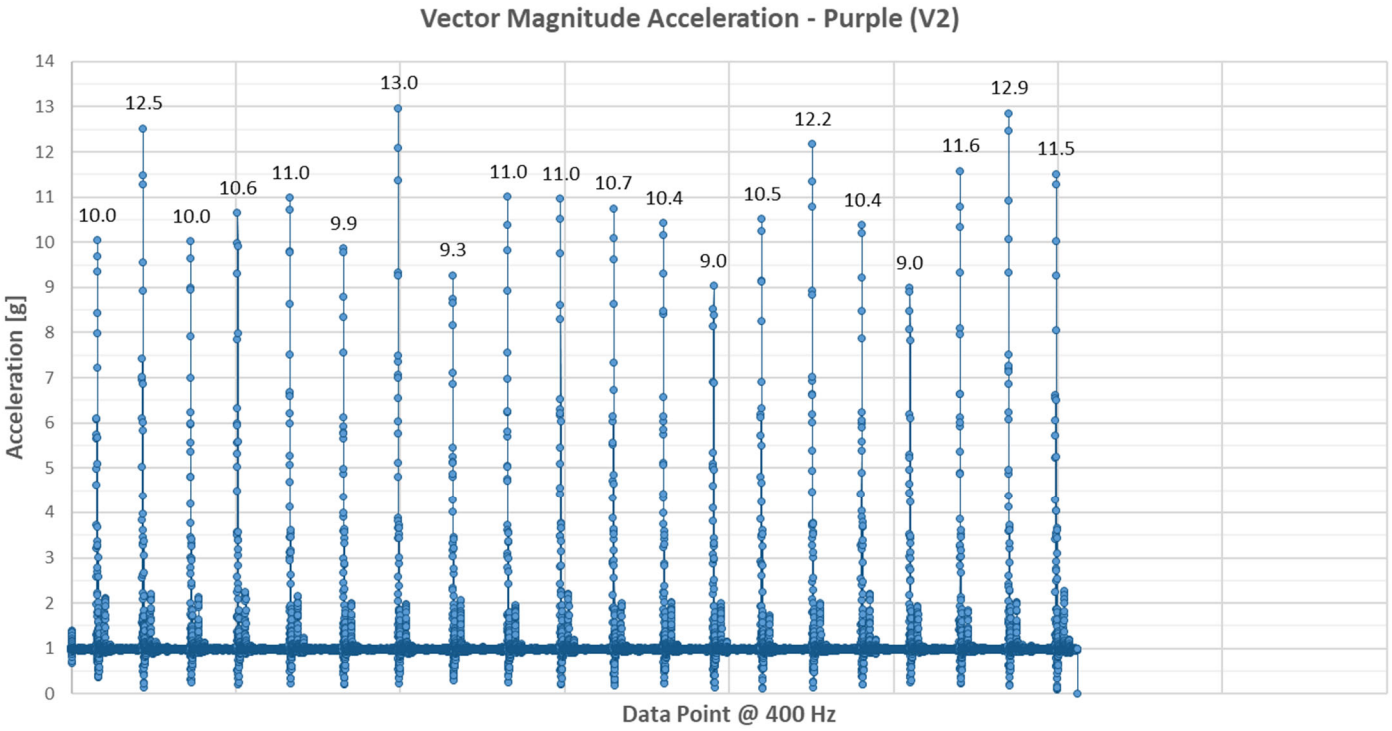

Vector Magnitude Acceleration - Nolah
Acceleration [g]
Data Point @ 400 Hz
3.6
3.7
4.5
4.9
4.9
5.6
5.3
4.9
4.4
6.6
5.4
5.7
5.3
5.4
5.5
5.6
5.2
5.2
6.6
5.2

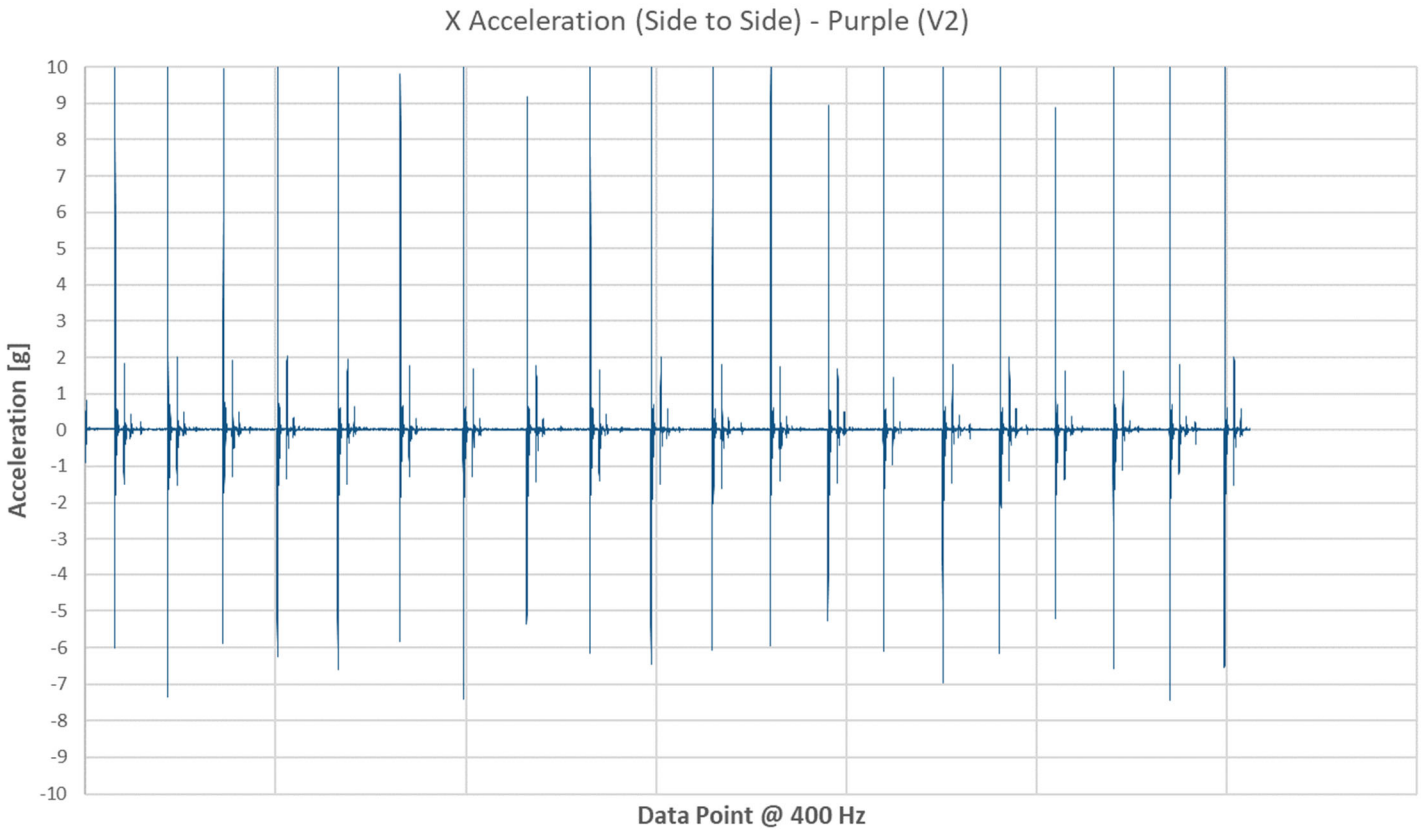

X Acceleration (Side to Side) - Nolah
Acceleration [g]
Data Point @ 400 Hz

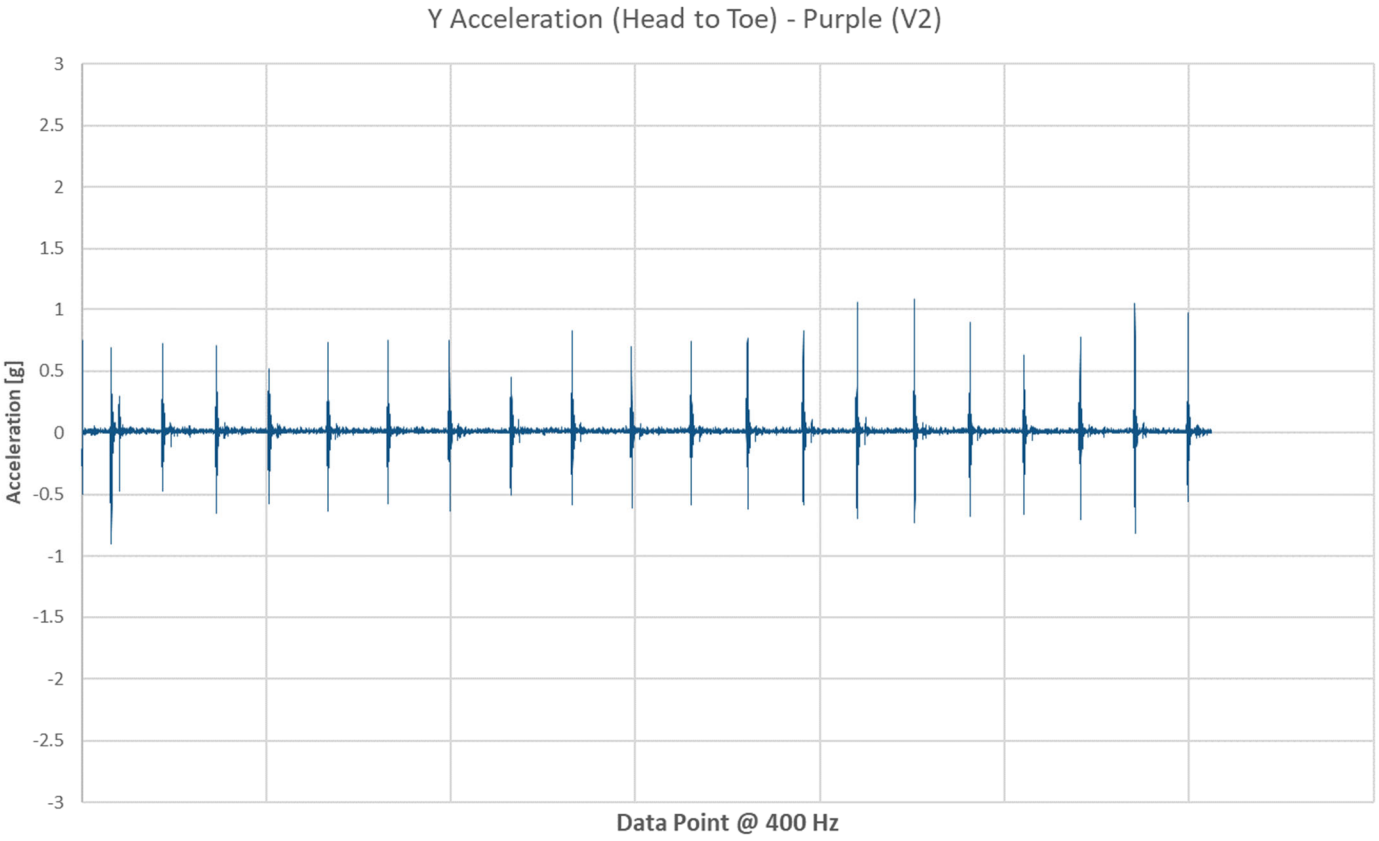

Y Acceleration (Head to Toe) - Nolah
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

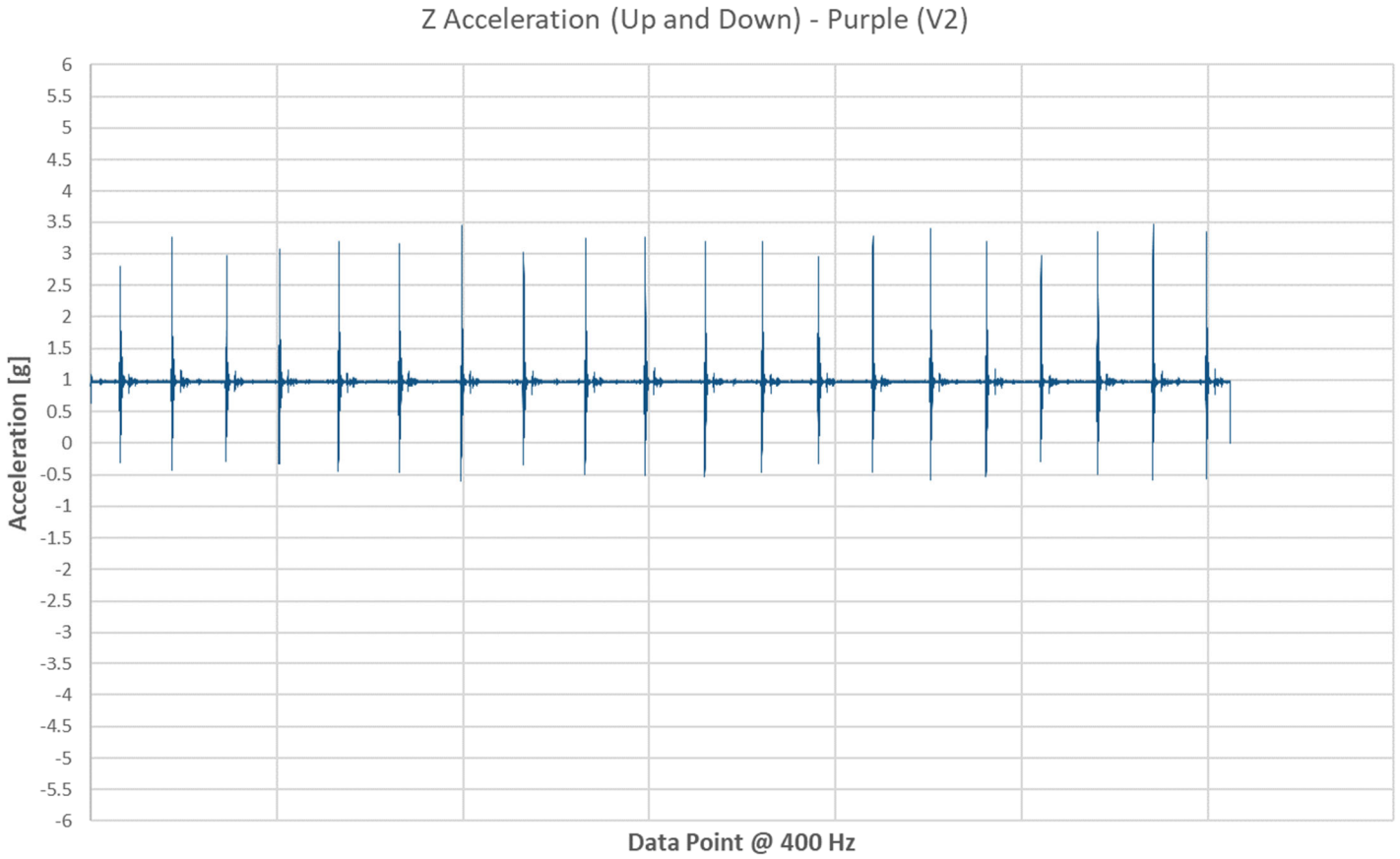

Z Acceleration (Up and Down) - Nolah
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 –PURPLE (V2)

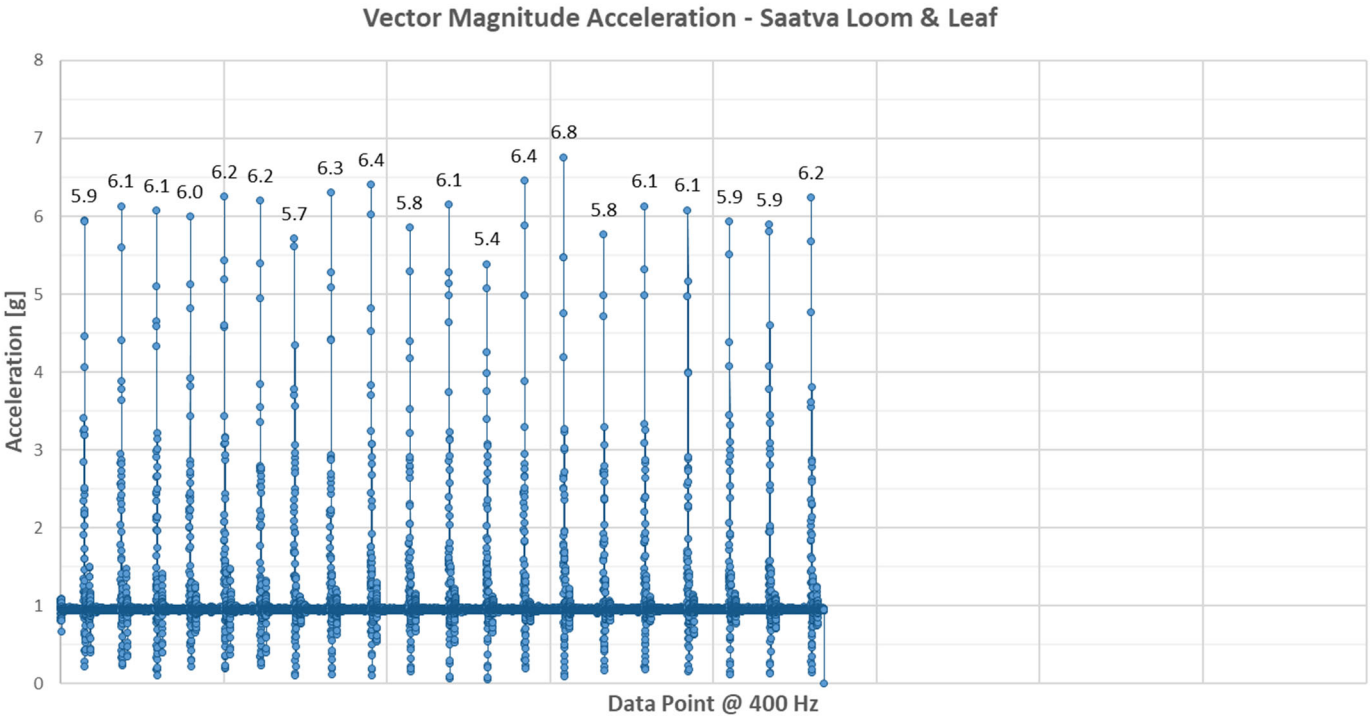


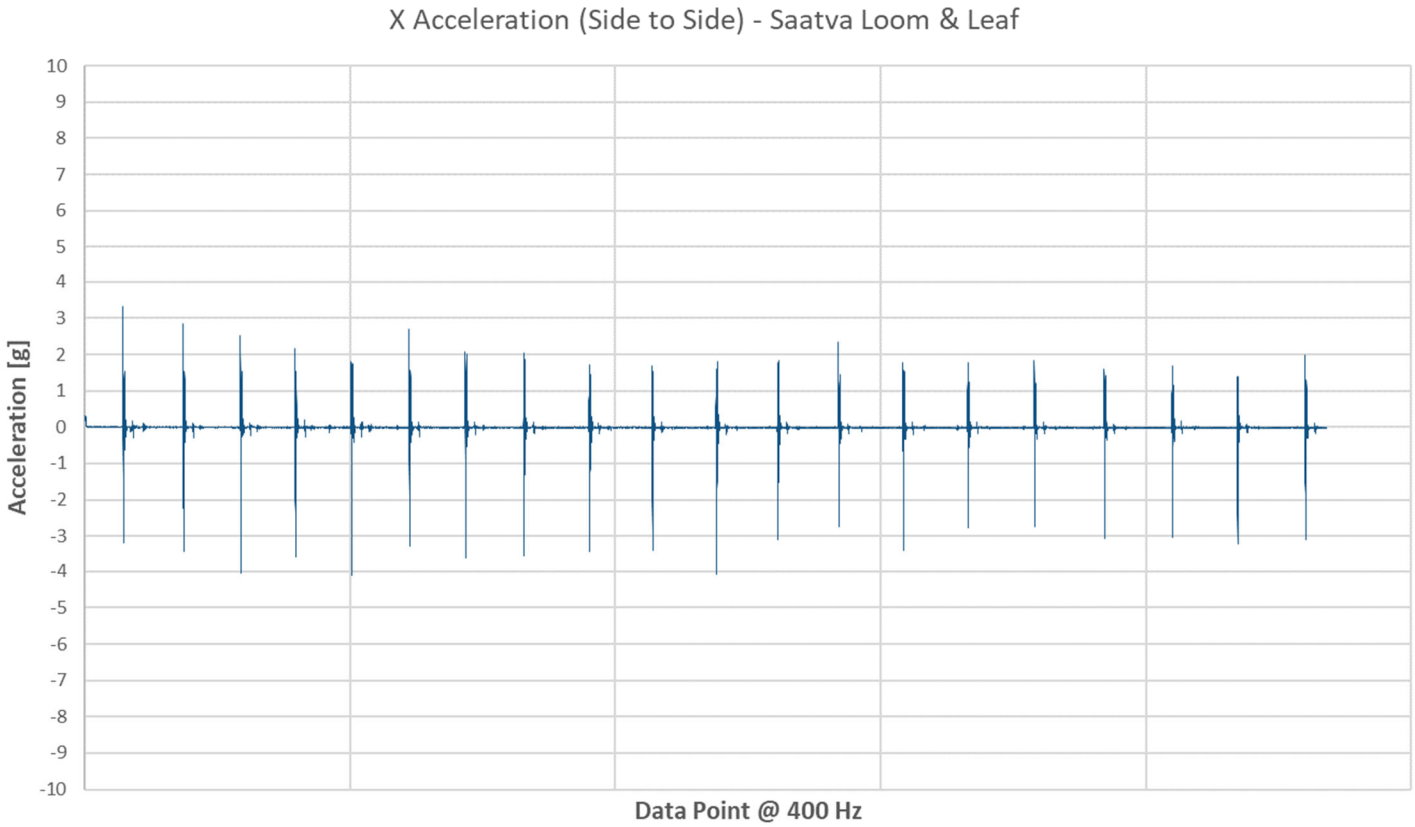


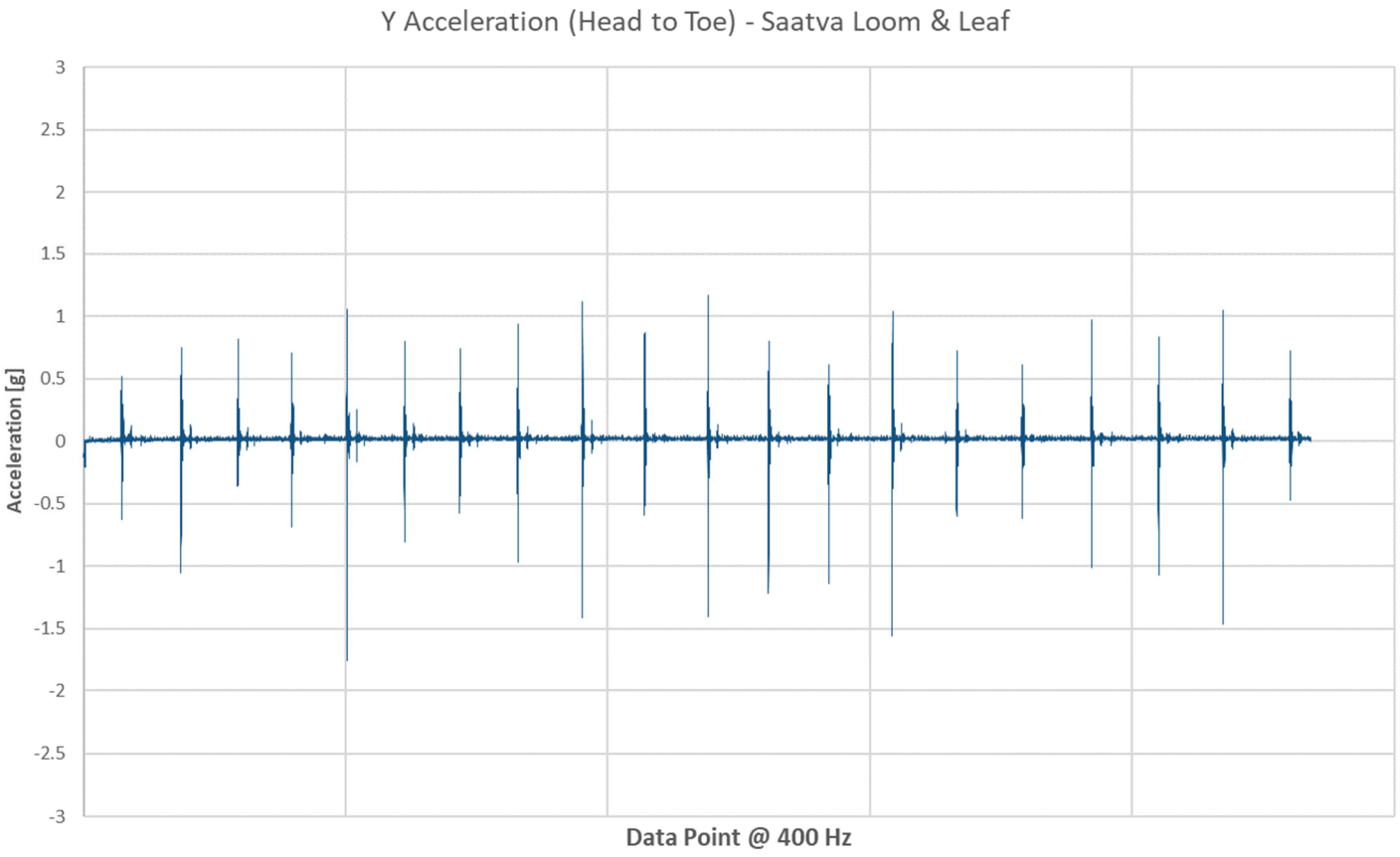

Y Acceleration (Head to Toe) - Purple (V2)
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

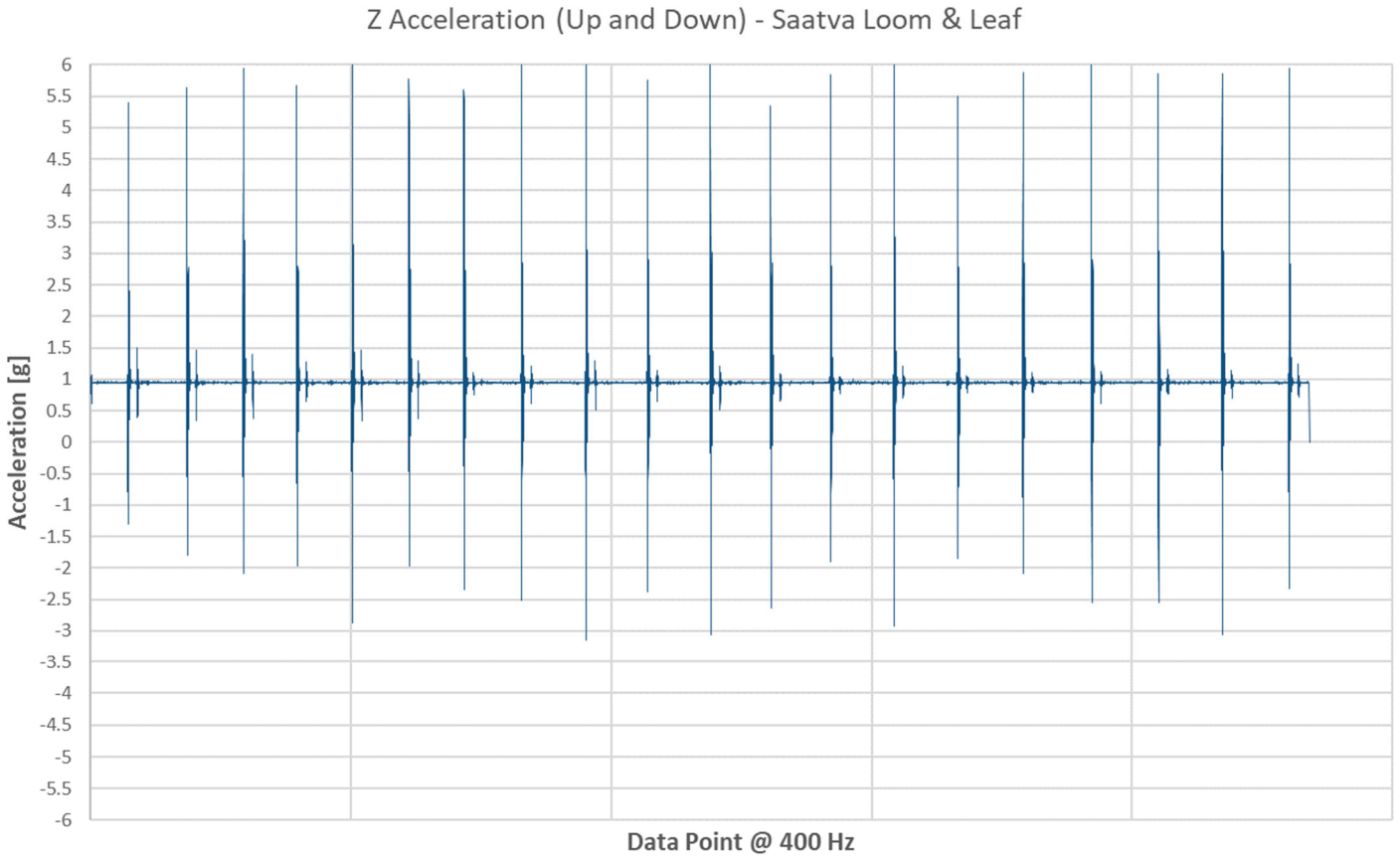

Z Acceleration (Up and Down) - Purple (V2)
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 –SAATVA LOOM & LEAF

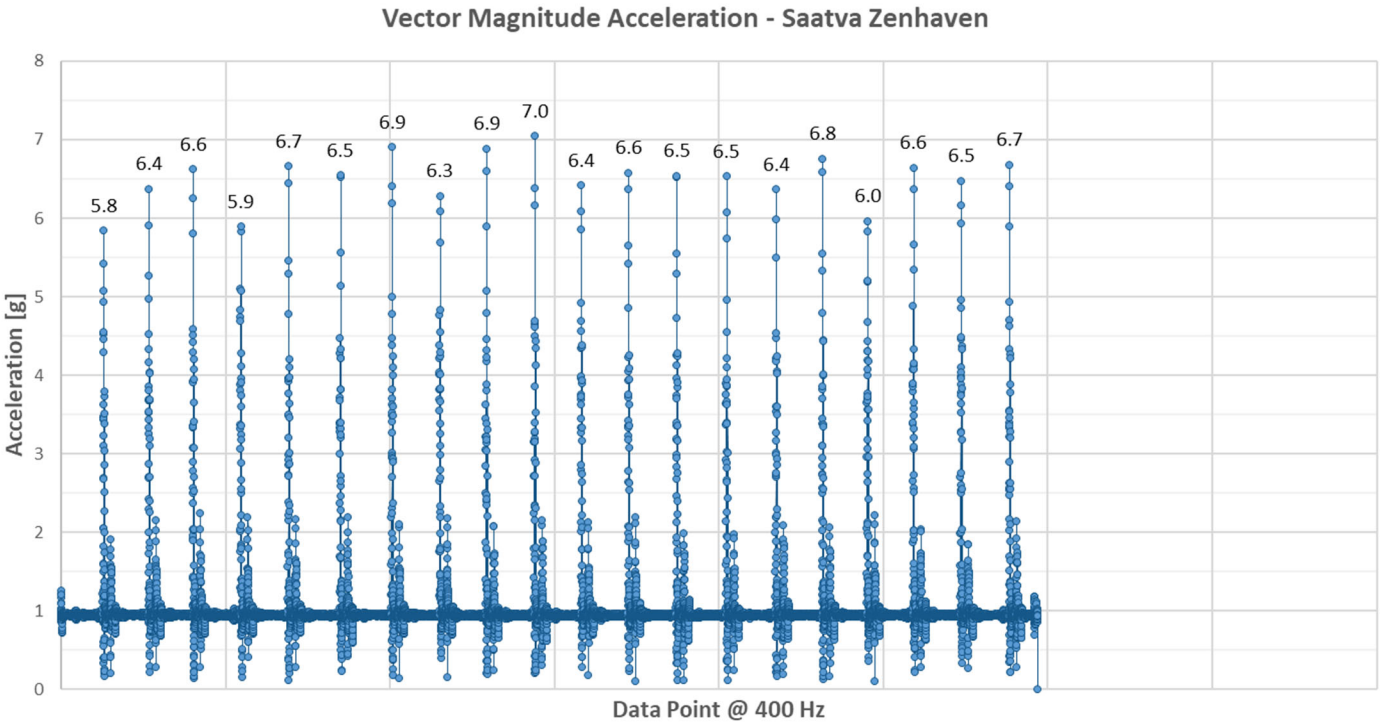


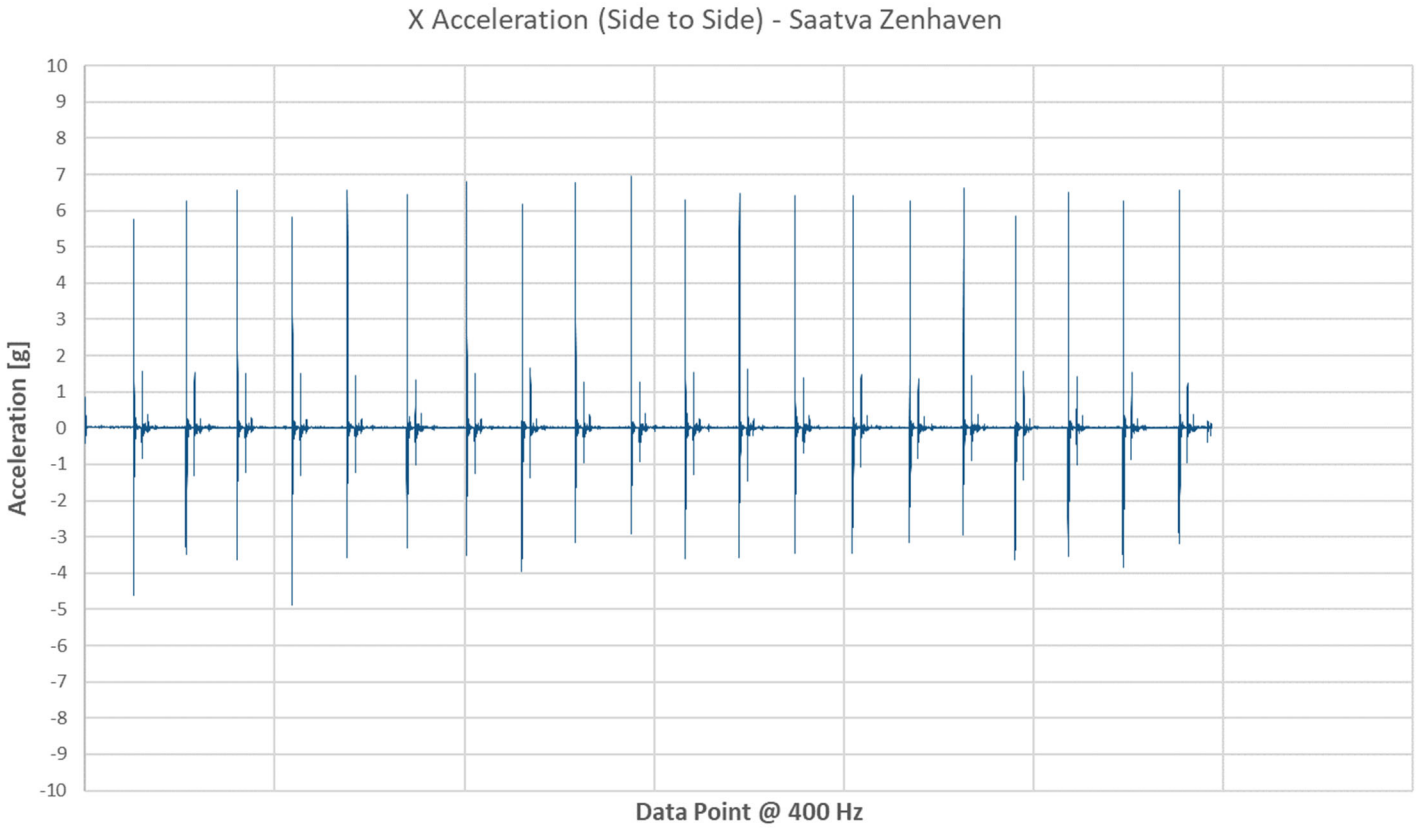


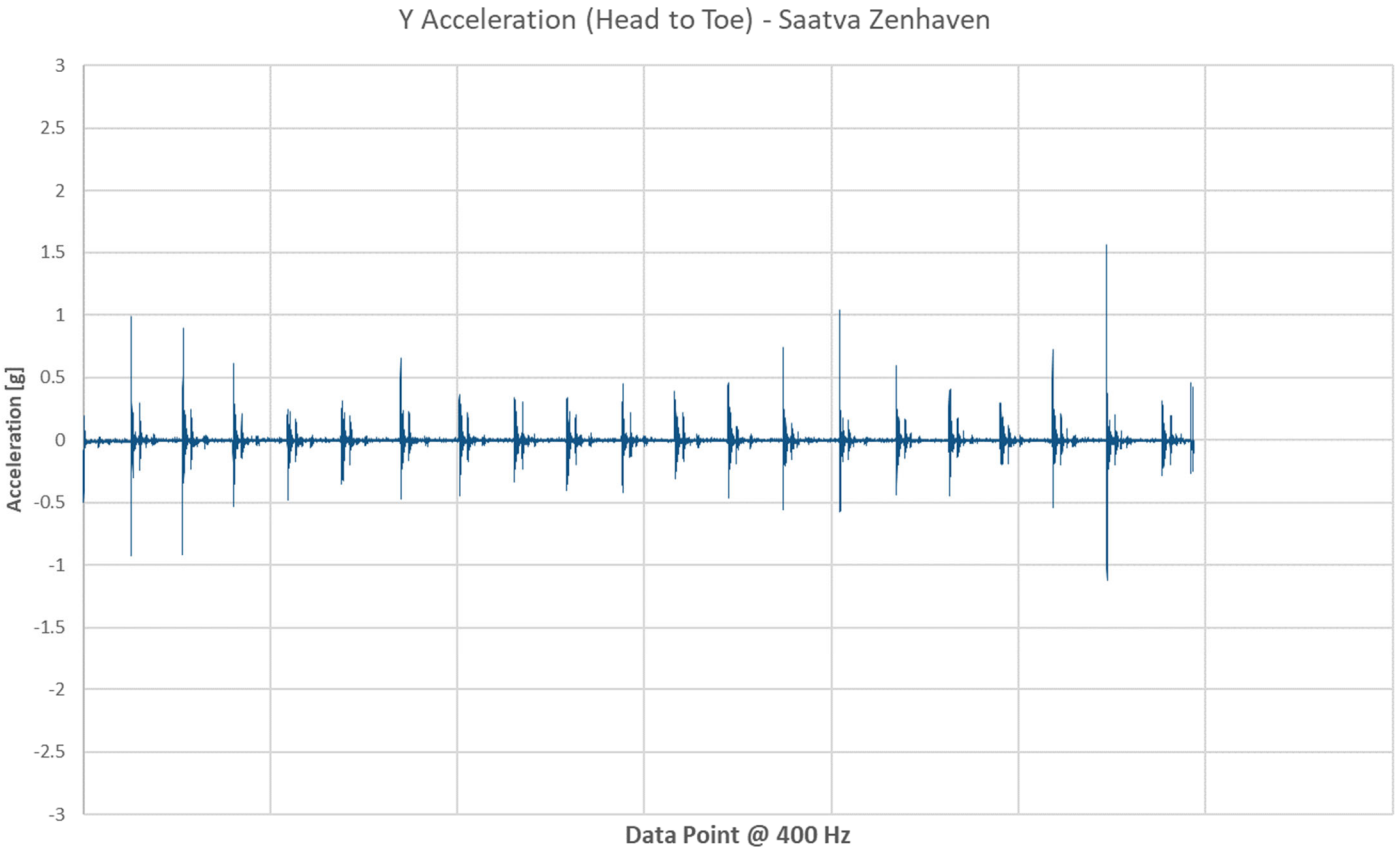

Y Acceleration (Head to Toe) - Saatva Loom & Leaf
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

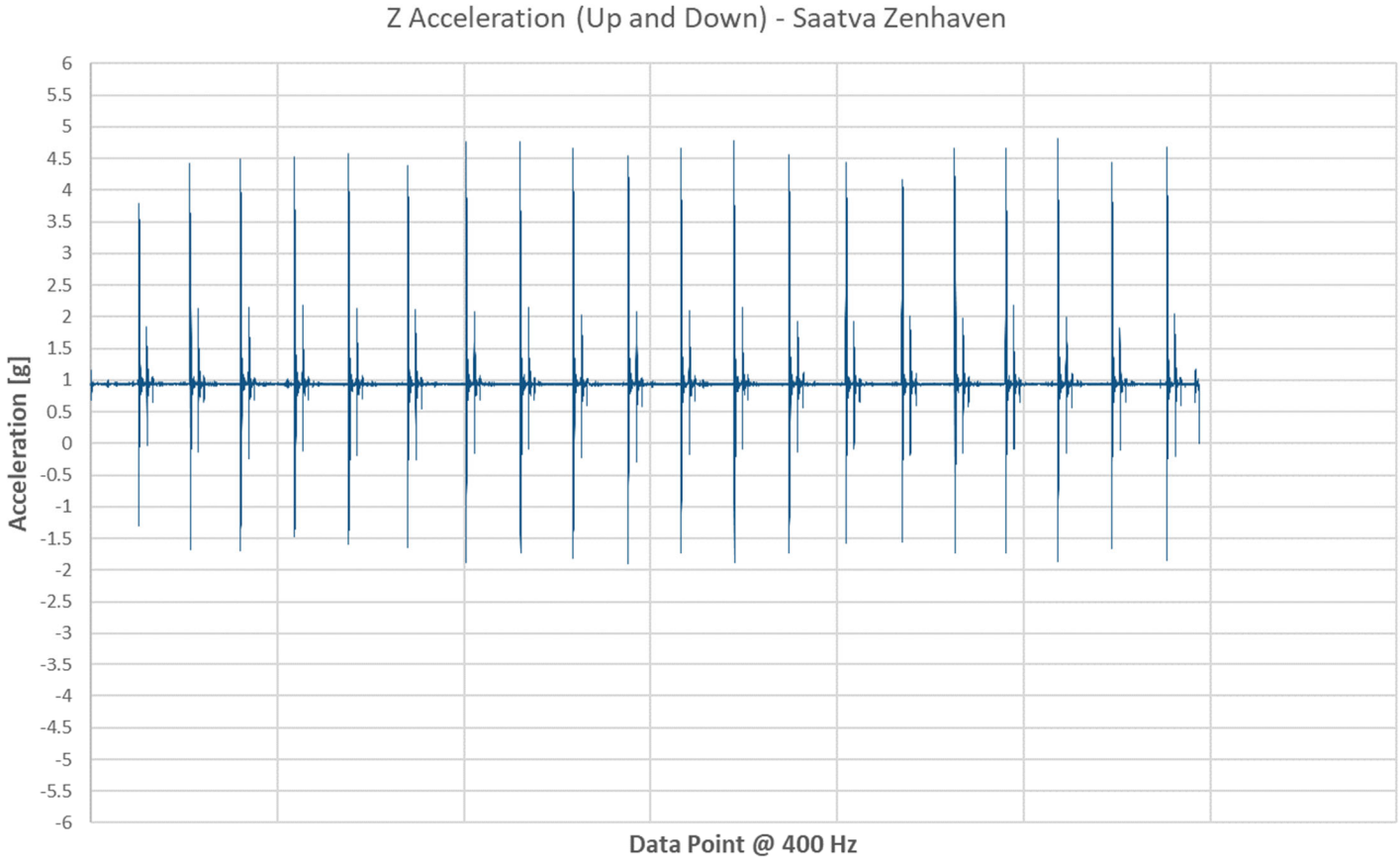

Z Acceleration (Up and Down) - Saatva Loom & Leaf
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 –SAATVA ZENHAVEN

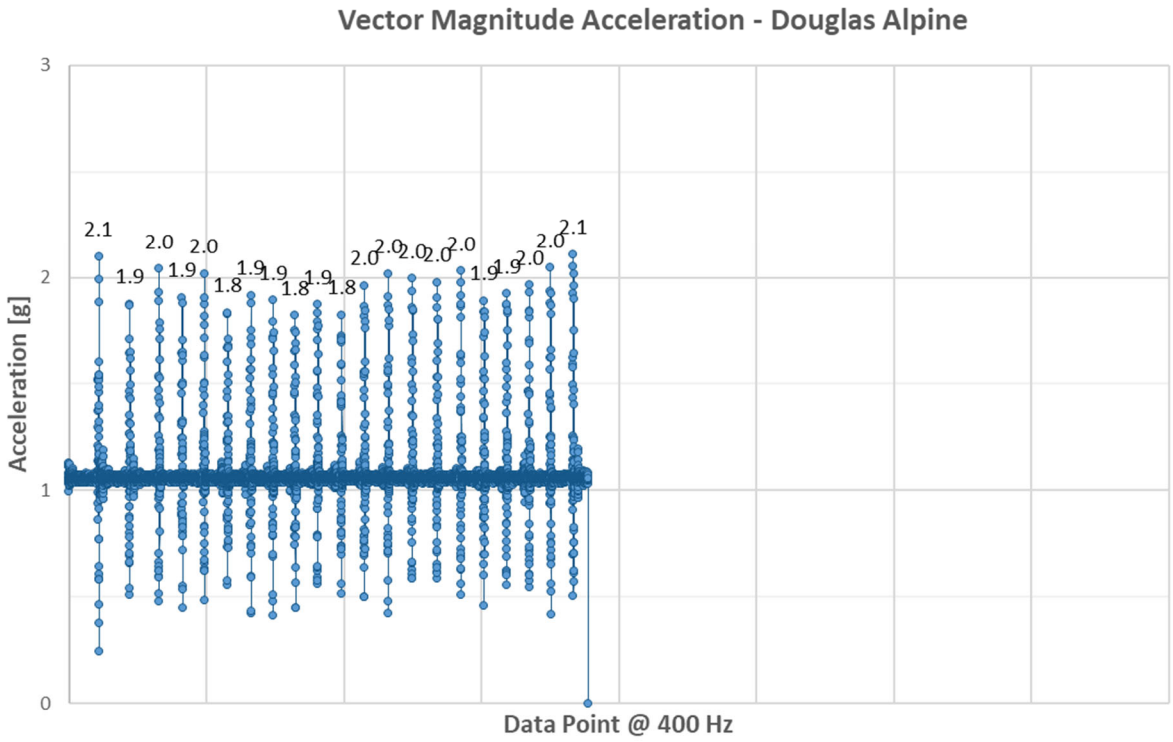


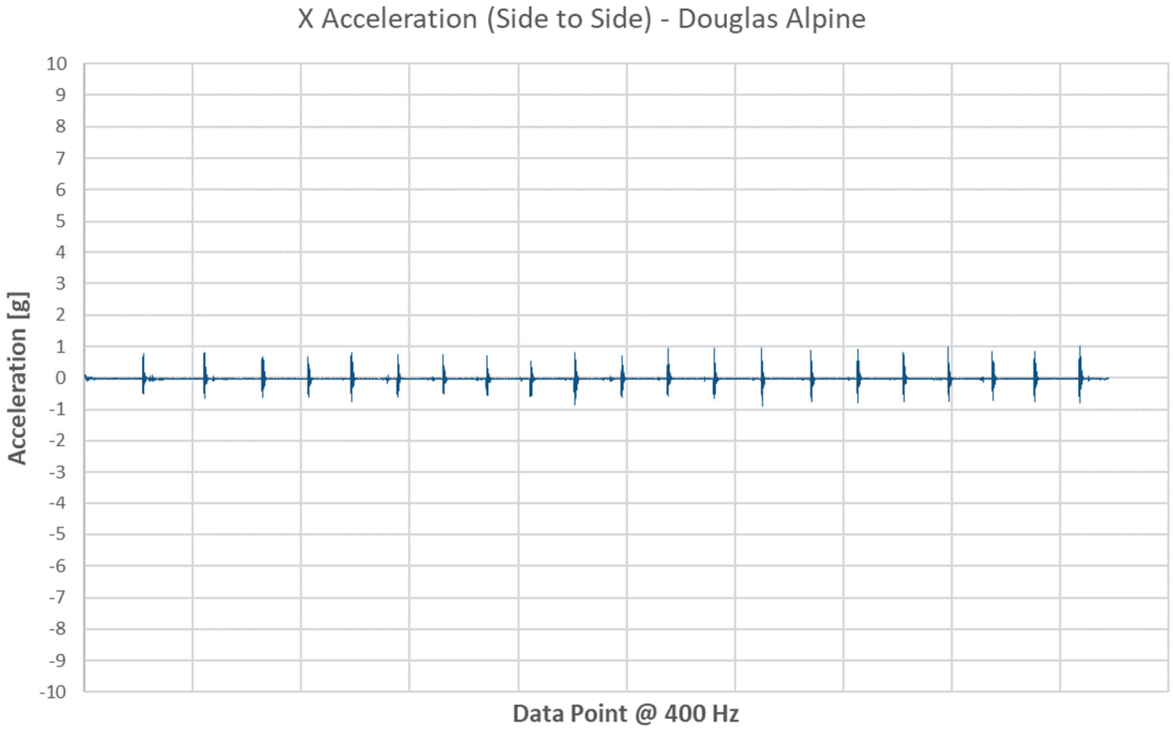


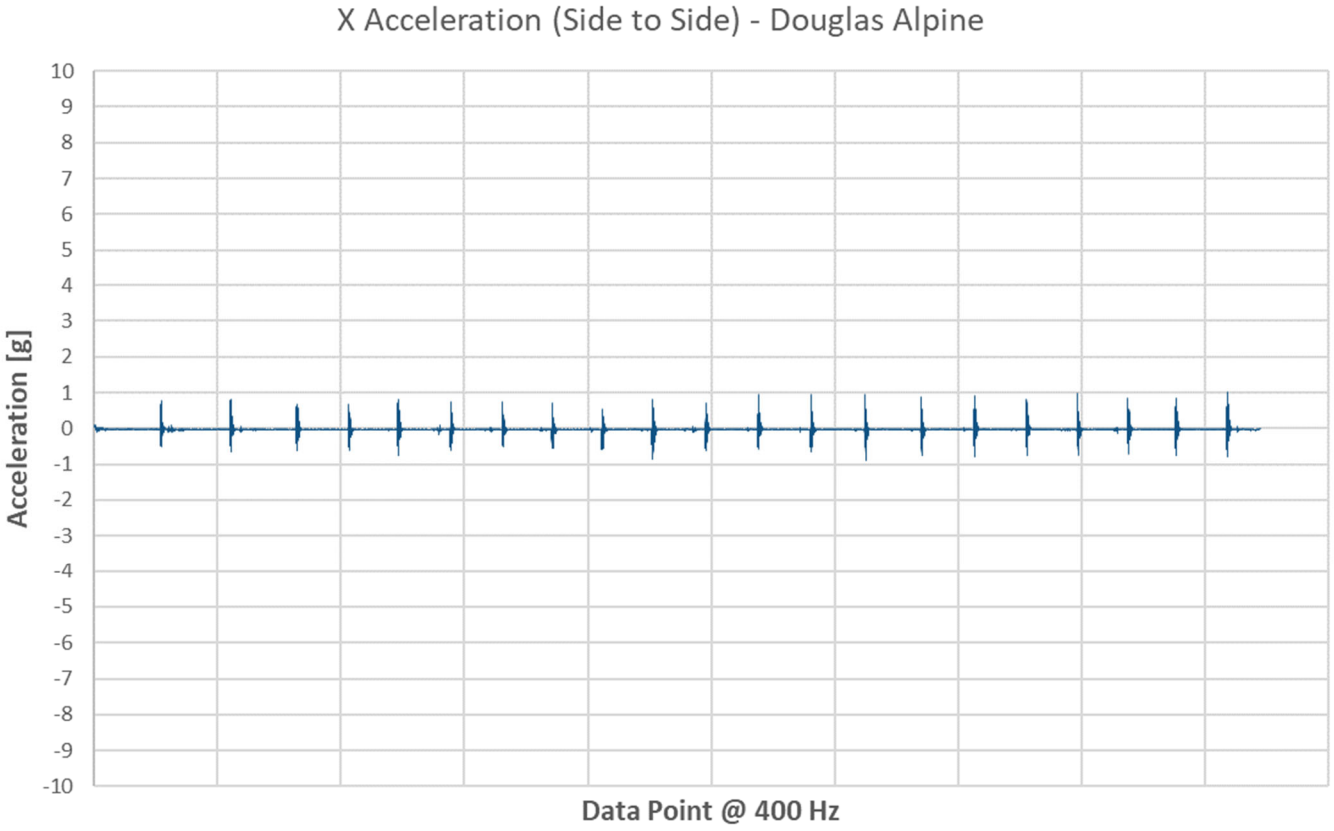

Y Acceleration (Head to Toe) - Saatva Zenhaven
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

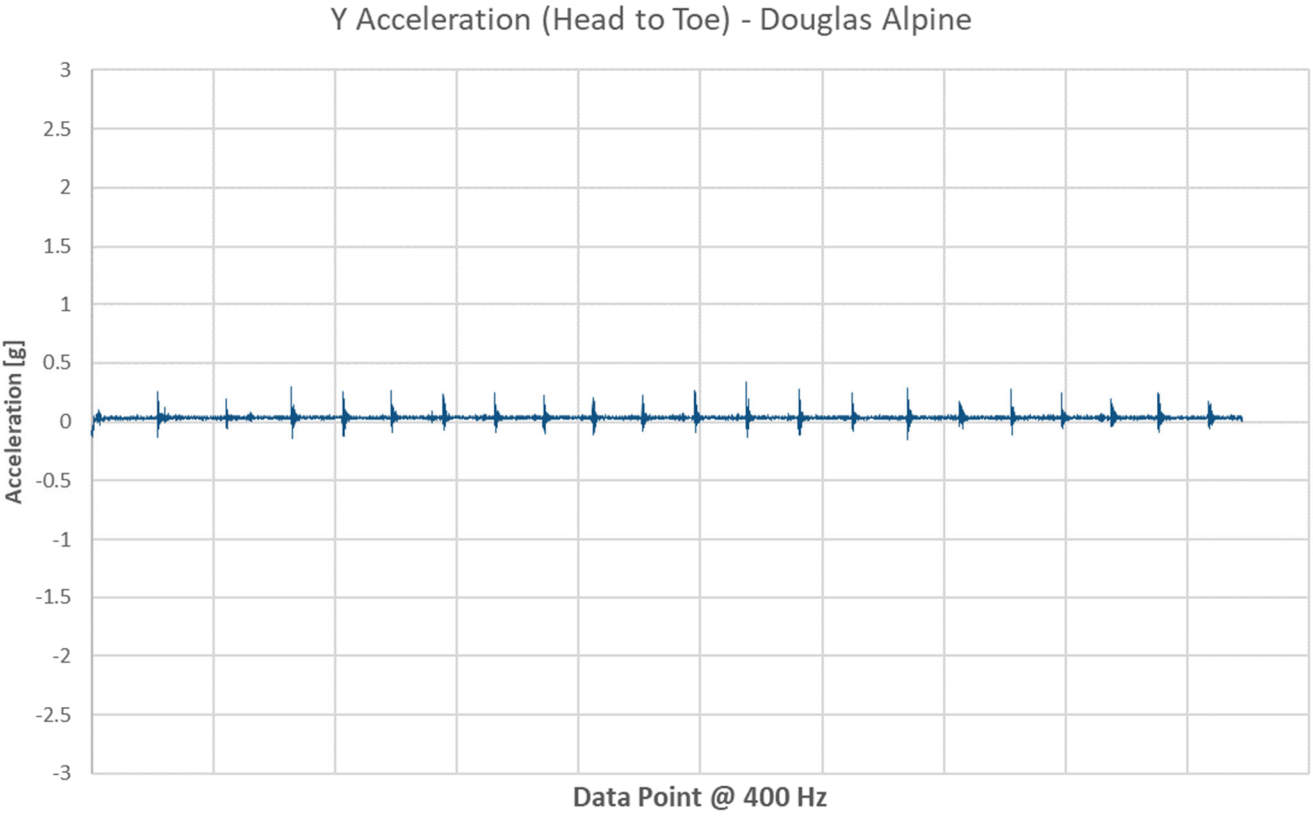

Z Acceleration (Up and Down) - Saatva Zenhaven
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 –DOUGLAS ALPINE

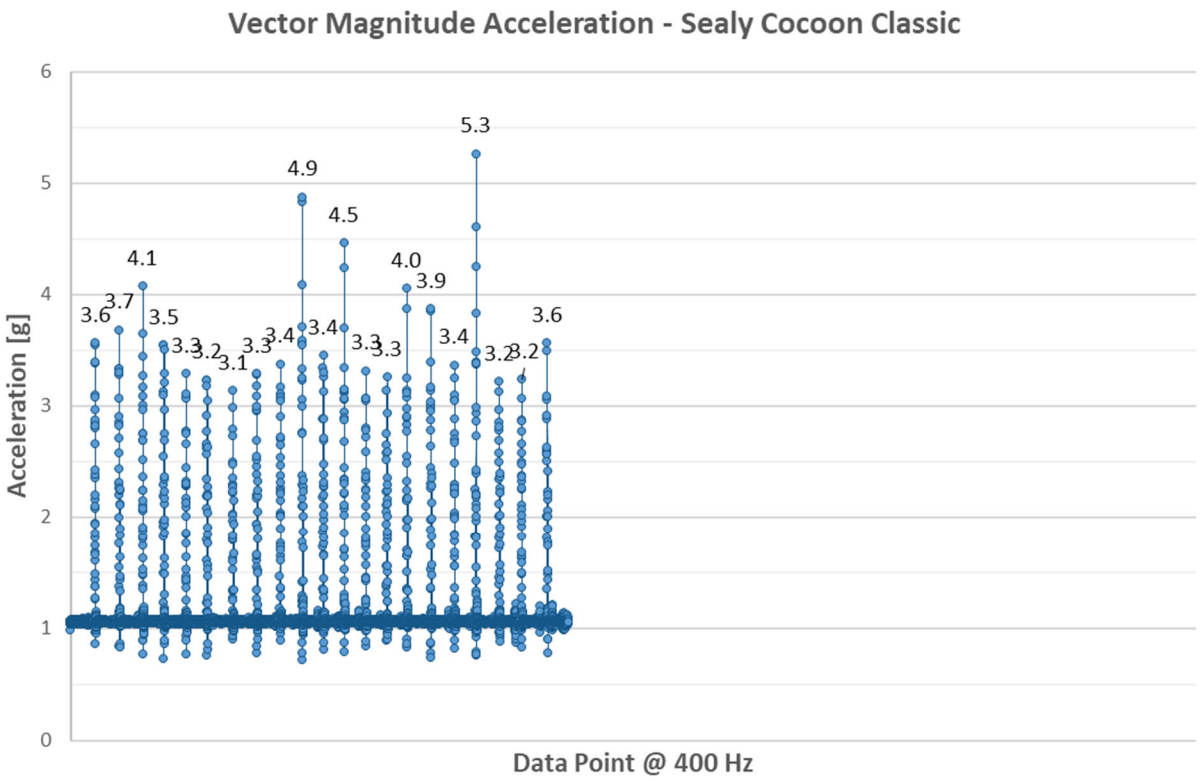


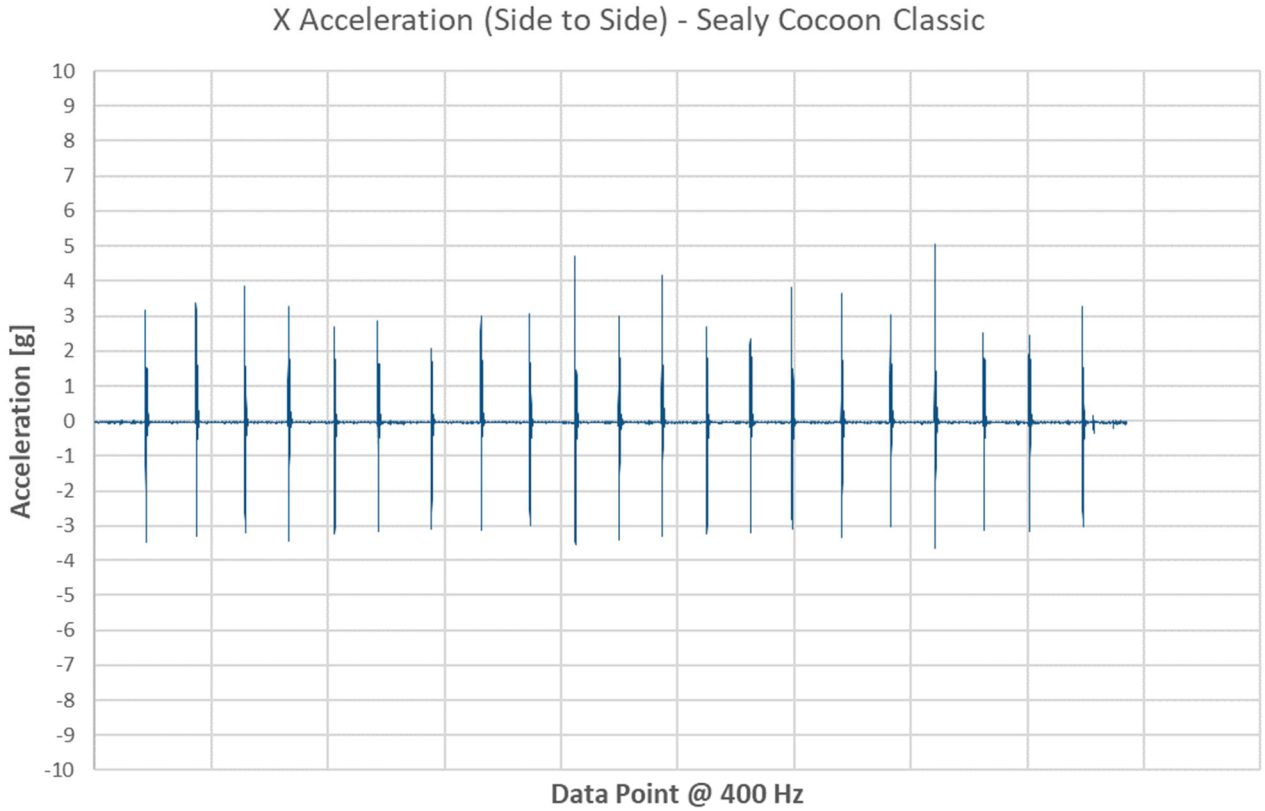


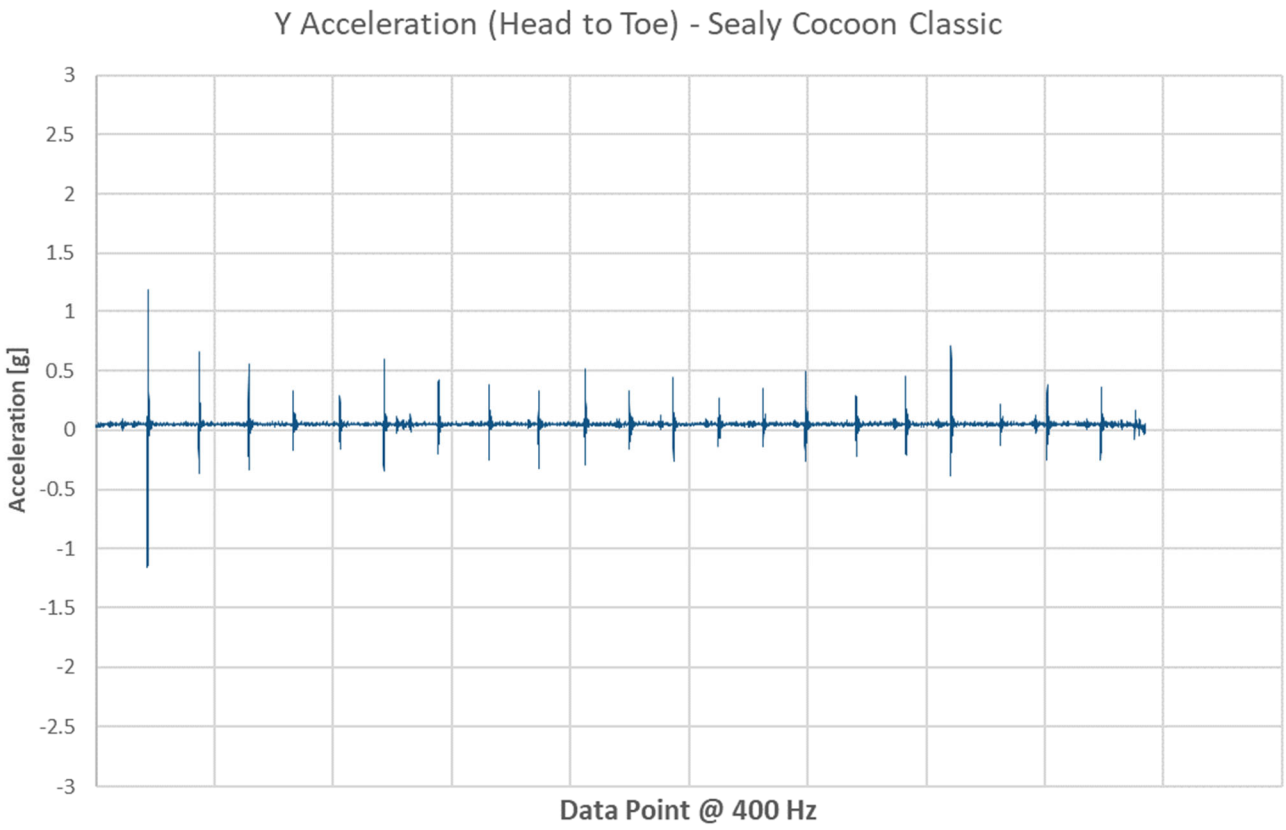

X Acceleration (Side to Side) - Douglas Alpine
Acceleration [g]
10
9
8
7
6
5
4
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
Data Point @ 400 Hz

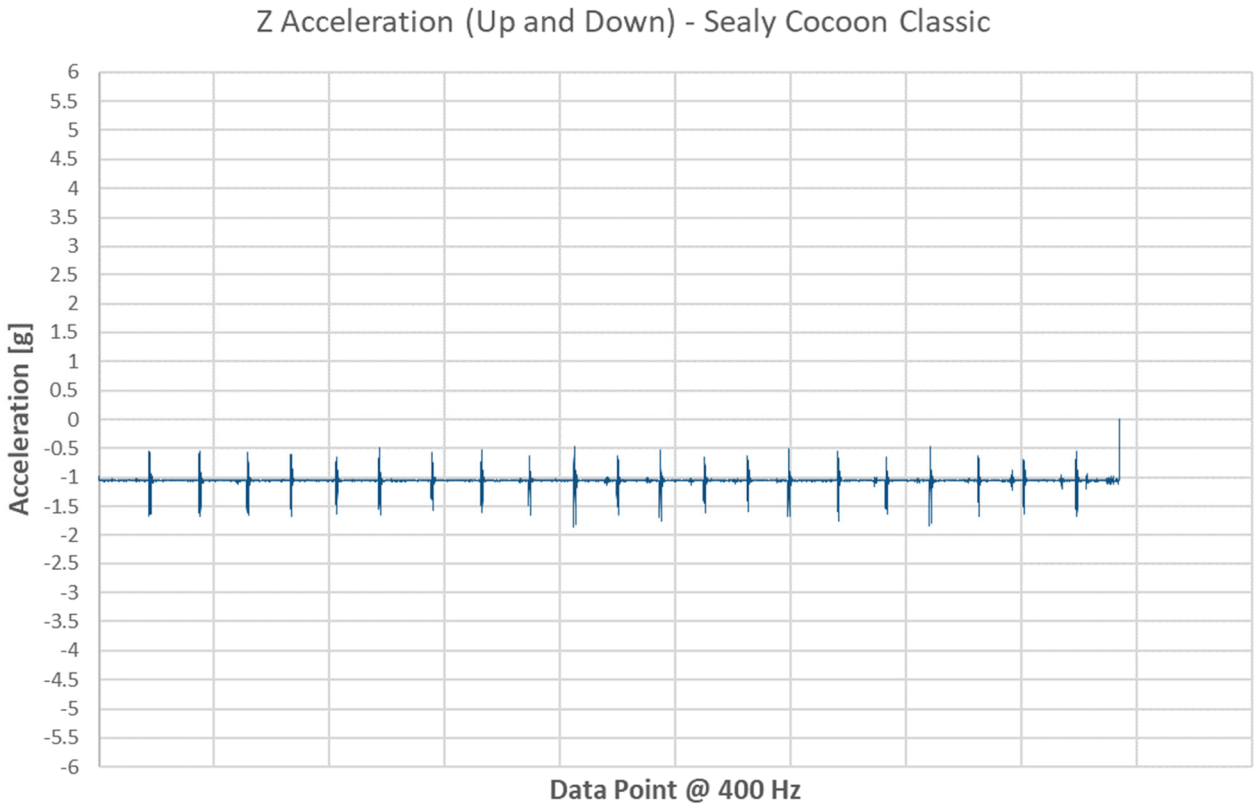

Y Acceleration (Head to Toe) - Douglas Alpine
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

TEST 3 –SEALY COCOON CLASSIC

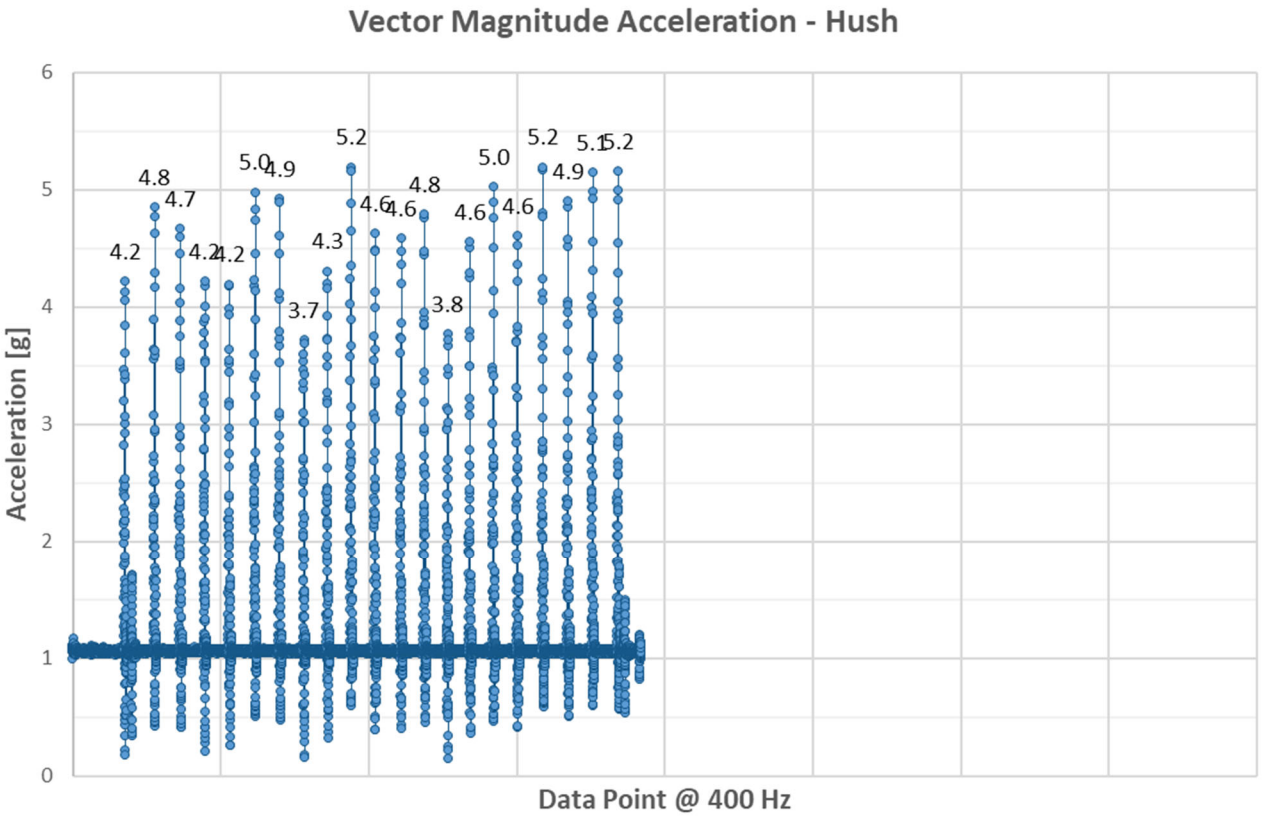


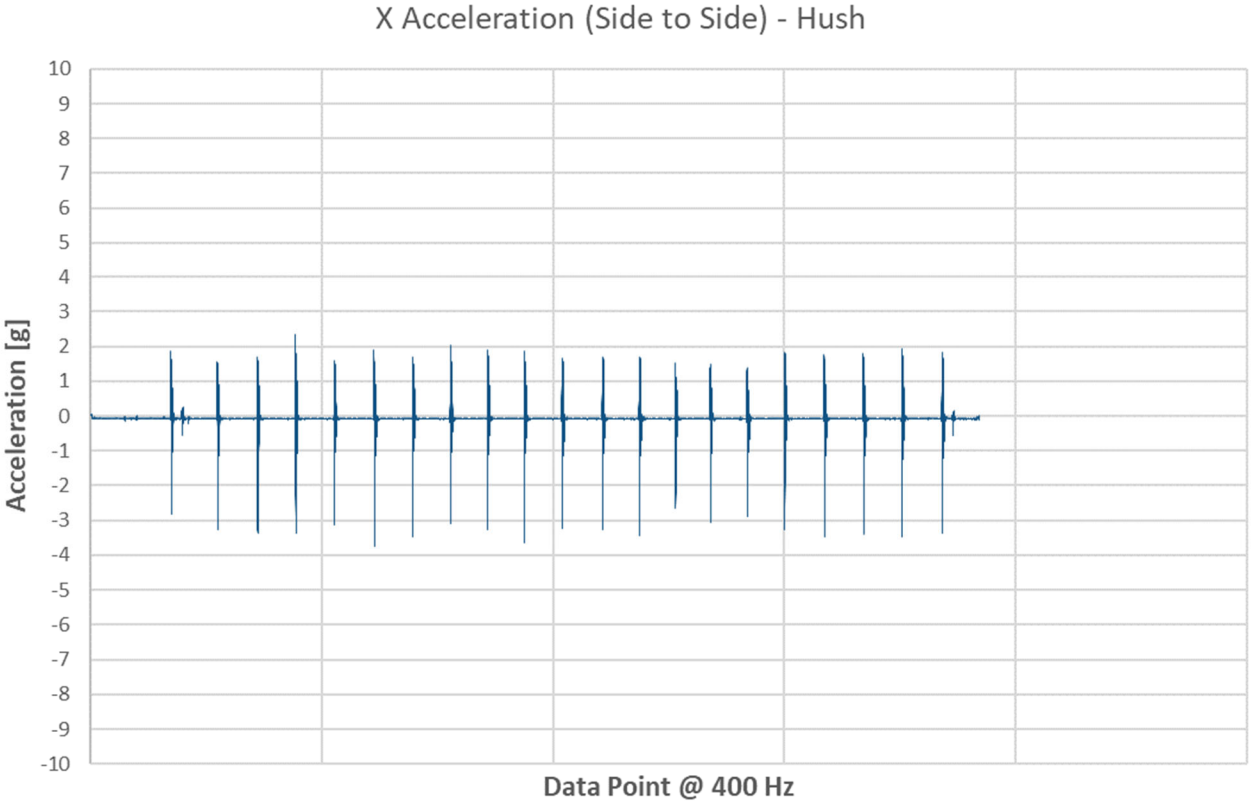


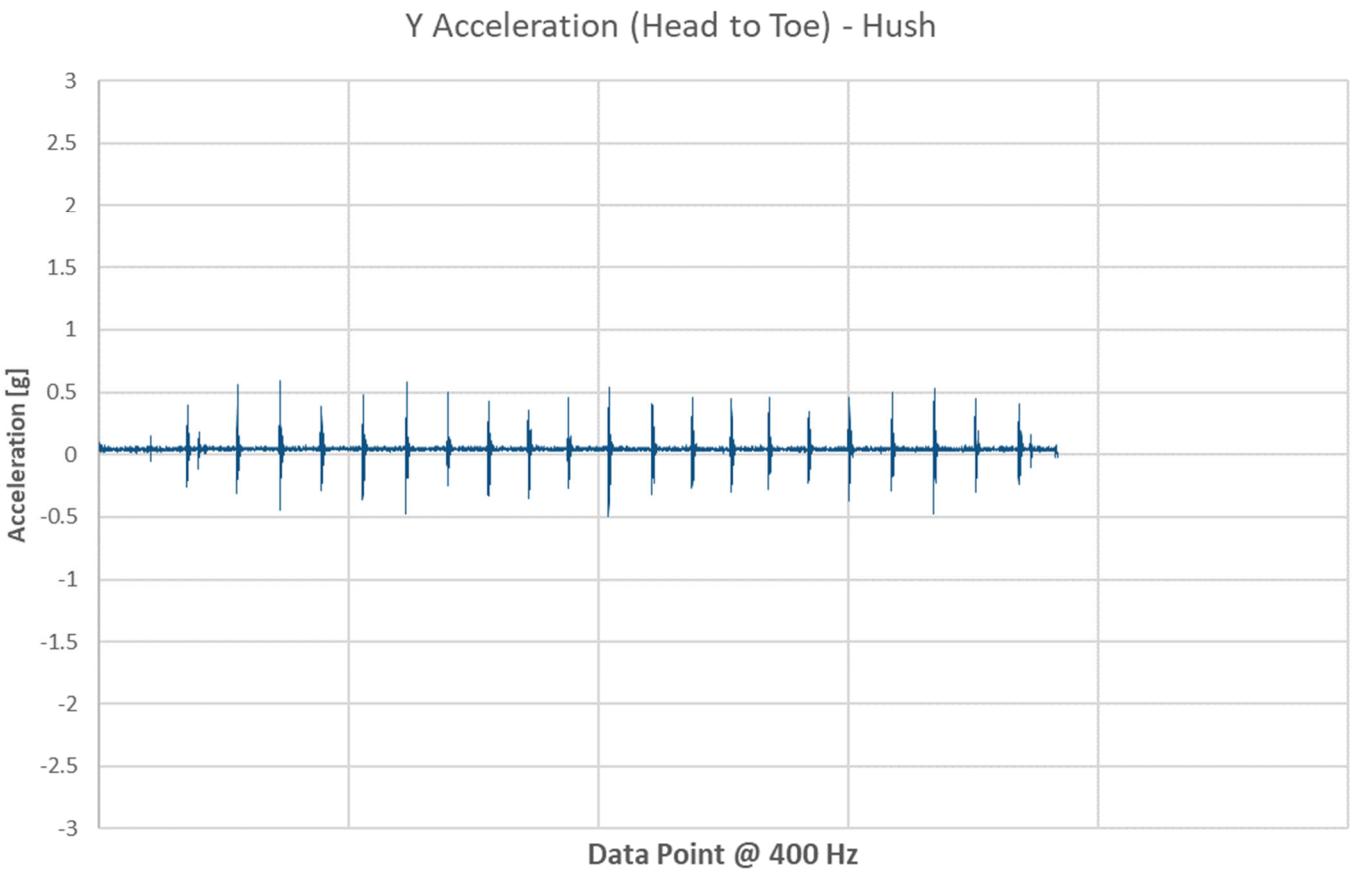

Y Acceleration (Head to Toe) - Sealy Cocoon Classic
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz

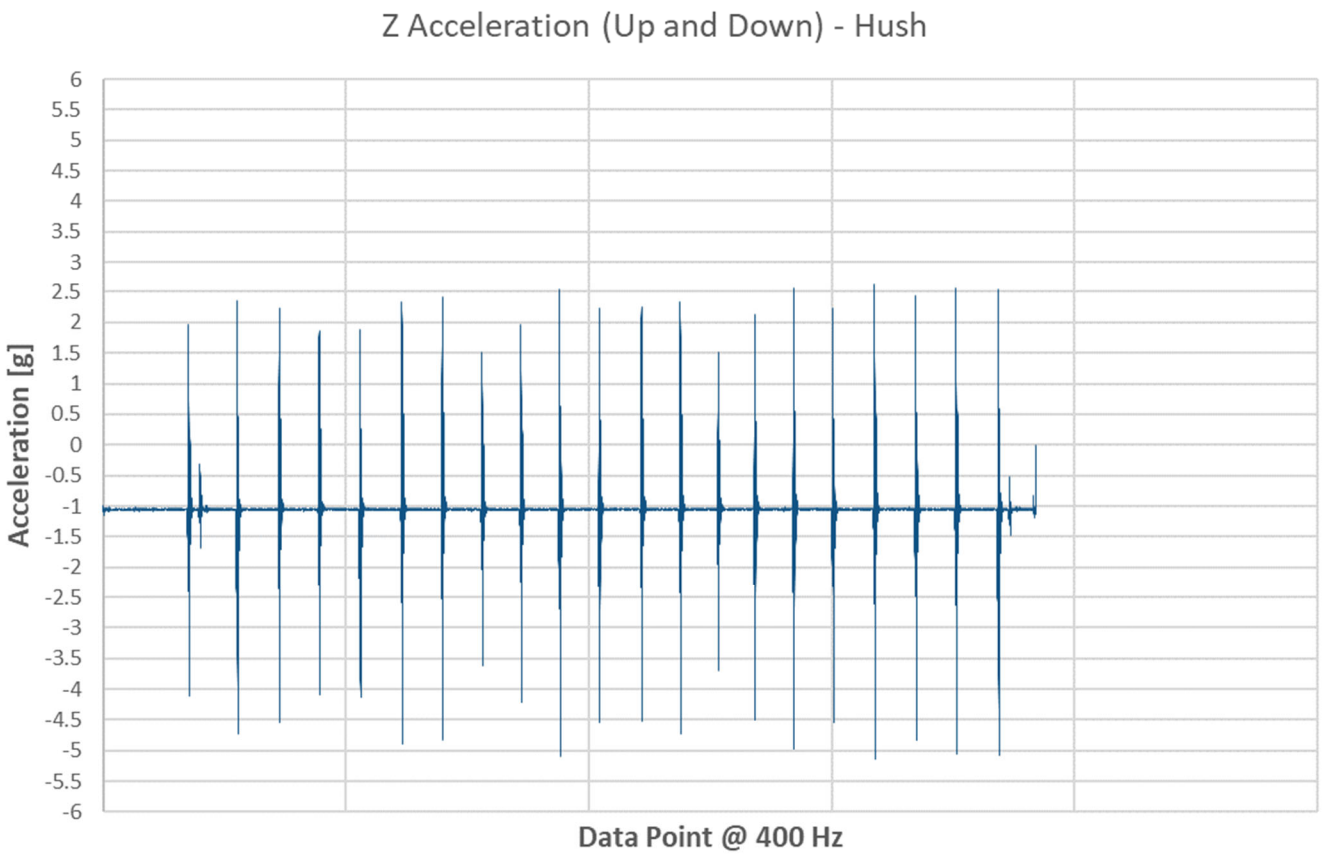

Z Acceleration (Up and Down) - Sealy Cocoon Classic
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

TEST 3 –HUSH

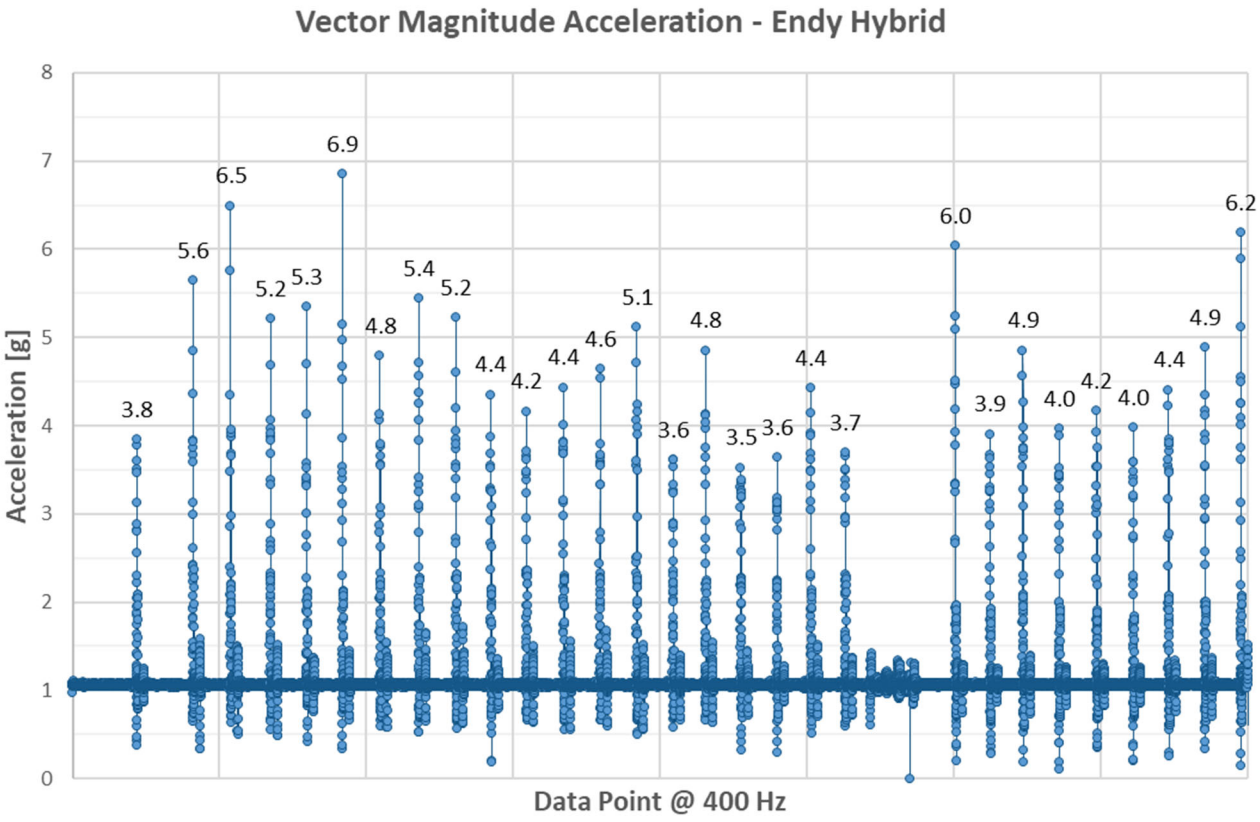

Vector Magnitude Acceleration - Hush
Acceleration [g]
Data Point @ 400 Hz
0
1
2
3
4
5
6
4.2
4.8
4.7
4.2
4.2
5.0
4.9
3.7
4.3
5.2
4.6
4.6
4.8
3.8
4.6
5.0
4.6
5.2
4.9
5.1
5.2

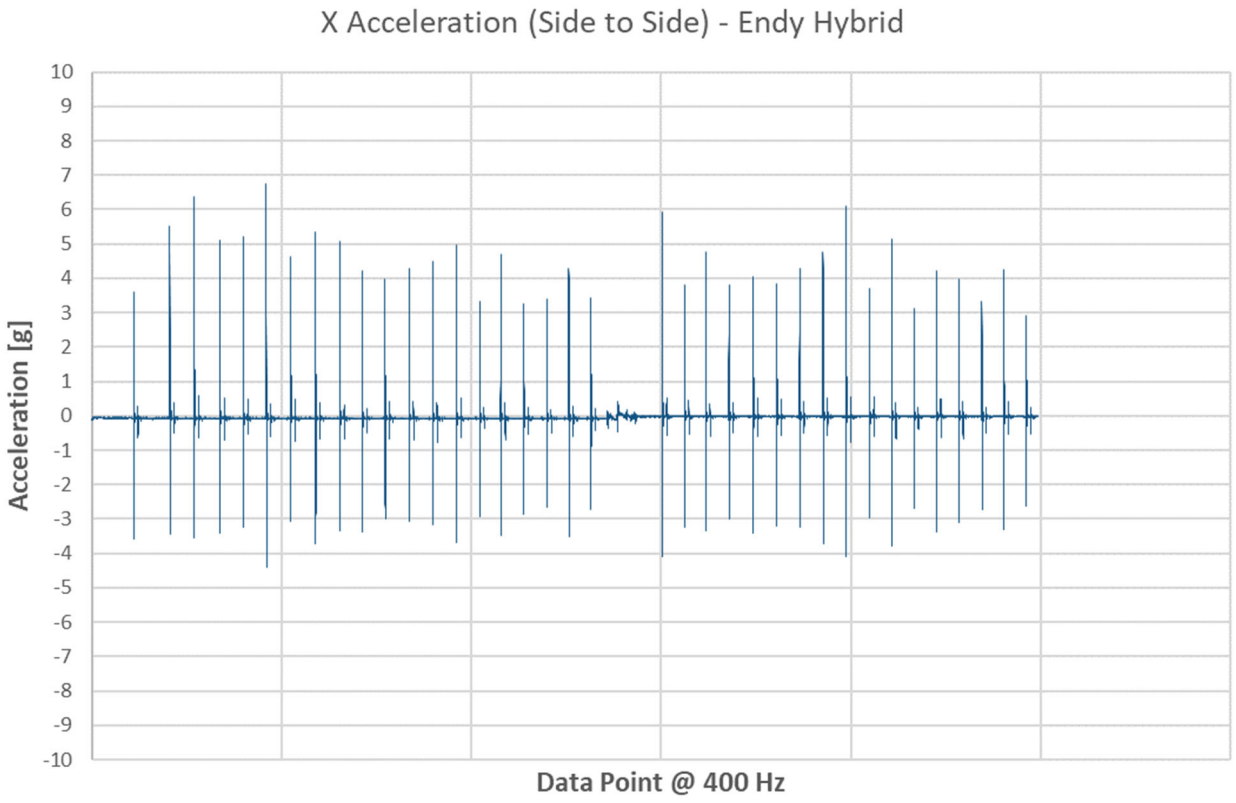

X Acceleration (Side to Side) - Hush
Acceleration [g]
Data Point @ 400 Hz
10
9
8
7
6
5
4
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10

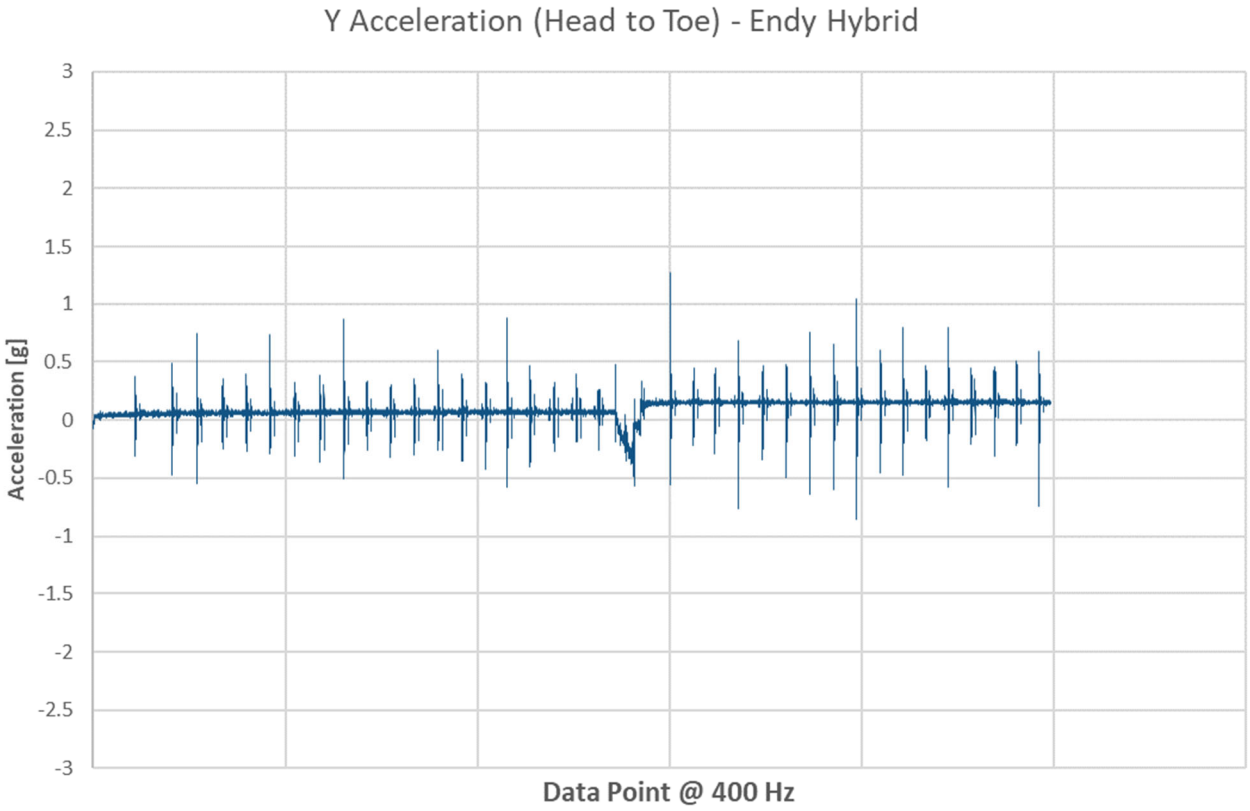

Y Acceleration (Head to Toe) - Hush
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Acceleration [g]
Data Point @ 400 Hz

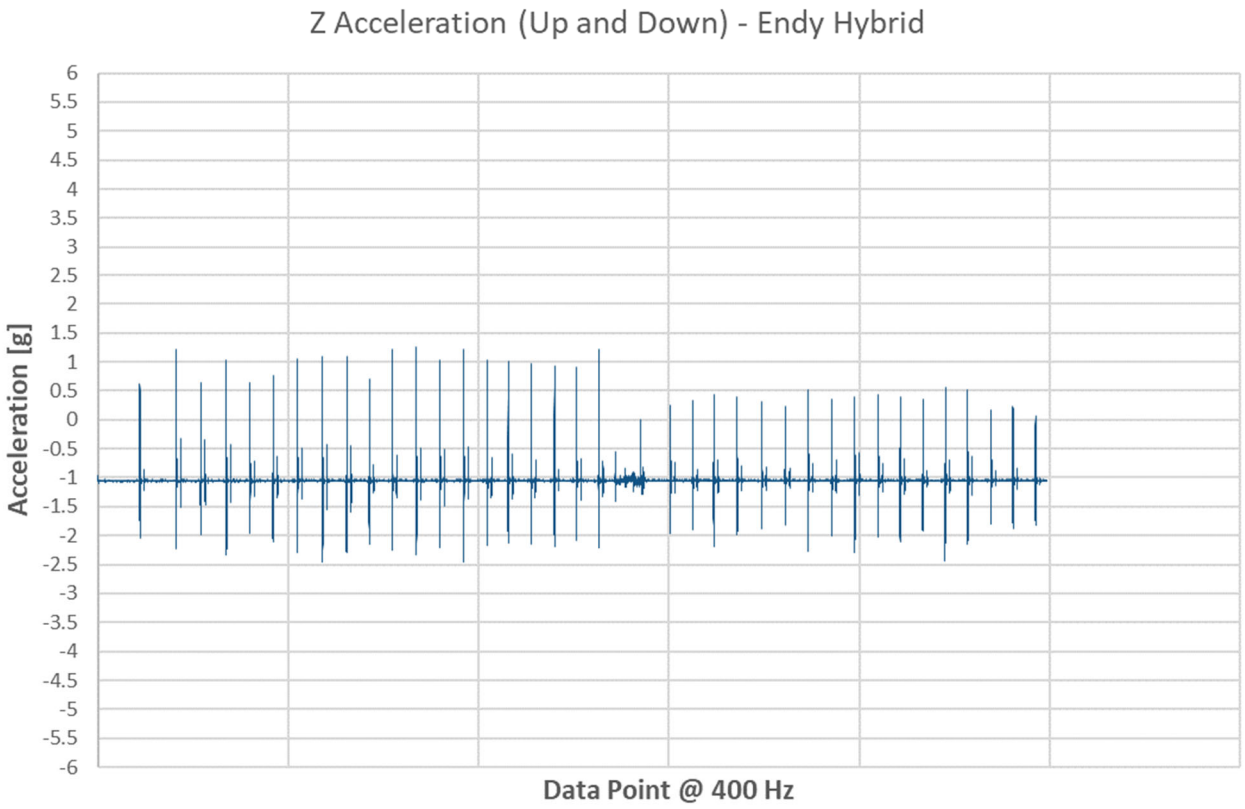


TEST 3 –ENDY HYBRID




X Acceleration (Side to Side) - Endy Hybrid
Acceleration [g]
10
9
8
7
6
5
4
3
2
1
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
Data Point @ 400 Hz


Y Acceleration (Head to Toe) - Endy Hybrid
Acceleration [g]
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
Data Point @ 400 Hz


Z Acceleration (Up and Down) - Endy Hybrid
Acceleration [g]
6
5.5
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-3.5
-4
-4.5
-5
-5.5
-6
Data Point @ 400 Hz

APPENDIX B

MATTRESS REVIEWS
by GoodMorning.com

Mattress-Reviews.com Testing Methodology

Goal:
To gather relative performance data from two or more different queen-sized mattresses to provide basis for comparison, grading, and discussion.

Equipment:

- Reference Load 1: plastic 5 gallon water cooler bottle – size: ~ 10.75” diameter X ~ 19.5” height; weight 42.3 lbs.
- Reference Load 2: spherical medicine ball - size: ~ 9” diameter; weight 10 lbs.
- Tape measure.
- Masking tape.
- Metal ruler.
- 4-foot piece of aluminium, ¼ inch thick.
- Calibrated accelerometer.
- A DSLR video camera.

General Test Conditions:

- Measure temperature and humidity in a room and verify it falls within the range of a normal house (18°C - 24°C / 25% - 50%). Measure and record temperature and humidity before each test.
- Lay the test mattress on a flat concrete floor such that the top and sides are unobstructed.

Test #1: Mattress Firmness (or "sinkage"):

Overview and Objective: Apply Reference Load 1 to the center of each subject mattress and measure the vertical displacement of each to establish their respective positions on a firmness (or "sinkage") scale. A low relative vertical displacement shall indicate a firmer mattress, while a high relative vertical displacement shall indicate a softer mattress.

Procedure:

1. Find the "approximate centre" of a given mattress sample:
    a. Place 2 straight lines (tensioned string-lines or straight measuring tape), each from one corner of the mattress to the diametrically opposite corner (e.g. top right to bottom left and top left to bottom right).
    b. Mark the intersection point of each straight line reference with masking tape - this is the "approximate center" of the mattress.
2. Place Reference Load 1 on the mattress, such that a point halfway between the top and bottom extremes of the water bottle lies on the marked approximate center of the mattress; and that the spout of the water bottom faces the foot of the bed, such that the sides of the water bottle are parallel to the sides of the mattress.
3. Wait 30 seconds for the water cooler bottle to entirely stop moving to allow the system to settle to a static state.
4. Place a 4-foot piece of ¼ inch thick aluminium across the surface of the mattress. The long side of the aluminium piece shall run parallel to the foot of the mattress. The metal shall rest beneath the spout of the bottle without touching the bottle.
5. Using a tape measure or metal ruler, measure and record the distance between the bottom of the spout and the metal level immediately below it, without noticeably distorting the shape of the mattress at the measurement point.

Test #2 Edge Supportiveness:

Overview and Objective: Apply Reference Load 1 to the edge each subject mattress and to measure the resultant vertical displacement of each to establish their respective positions on an “edge supportiveness” scale. A low relative vertical displacement shall indicate a mattress with more edge support, while a high relative vertical displacement shall indicate a mattress with less edge support.

Procedure:

1. Find the “approximate middle” of the foot of a given mattress sample:
    a. Measure the length of the top-facing edge of the foot of the subject mattress.
    b. Divide the measurement by 2 and mark this point with masking tape - this is the “approximate middle” of the foot of the mattress.
    c. Measure the height of the mattress at this point.
2. Place Reference Load 1 on the mattress such that a predetermined point of the water bottle lies on the marked “approximate middle” of the mattress edge, and that the sides of the water bottle are parallel to the sides of the mattress. The long edge of the water bottle shall be parallel to the long side of the mattress.
    a. This predetermined point of the water bottle is where the spout of the water bottle begins. That is, there shall be 16 inches of the 19-inch water bottle lying ‘behind’ the edge of the mattress (i.e. on the mattress). The 3-inch spout shall extend off the edge of the mattress.
3. Wait 30 seconds for the water cooler bottle to entirely stop moving to allow the system to settle to a static state.
4. Measure the distance between the bottom of the spout and the floor (***variable X***).
5. Add the height of the mattress (see step 1c) to 4.25 inches (***variable Y***).
6. Y ***minus*** X = vertical displacement.

Test #3 Motion Isolation:

Overview and Objective: Apply a reference impulse to the top side of each subject mattress, representative of human movement on the mattress, and measure the resultant peak acceleration of a calibrated accelerometer placed on the mattress a fixed distance away from the epicenter of the impulse to establish their respective positions on a "motion isolation" scale. A high resultant peak acceleration shall indicate less motion isolation, while a low resultant peak acceleration shall indicate more motion isolation.

Procedure:

1. Find two "Sleep Points" on a given mattress sample:
    a. Measure the width of the mattress and divide by 3 (the "Edge Distance").
    b. Measure the length of the mattress and divide by 2 (the "Center Distance").
    c. Find the first point lying Center Distance from the foot of the bed and Edge Distance from one the side of the bed and mark this point with masking tape - this is the first Sleep Point.
    d. Repeat the above step for the other side of the bed - this is the second Sleep Point.
2. Center a calibrated accelerometer on the mattress.
3. Drop a 10 lbs sphere (9" diameter) on the second Sleep Point on the mattress from a height of 39" above the mattress surface.
4. Wait 5 seconds and record the peak acceleration experienced by the accelerometer.
5. Repeat 20 times and take an average.

Test #4 Bounciness:

Overview and Objective: Drop a 10lb sphere (9” diameter) from a fixed distance on to the top side of each subject mattress and measure the resultant peak rebound height on its first bounce. A high resultant peak rebound height shall indicate more bounciness, while a low resultant peak height shall indicate less bounciness.

Procedure:

1. Find the “Approximate Centre” of a given mattress sample:
    a. Place 2 straight lines (tensioned string-lines or straight measuring tape), each from one corner of the mattress to the diametrically opposite corner (e.g. top right to bottom left and top left to bottom right).
    b. Mark the intersection point of each straight line reference with masking tape - this is the “approximate center” of the mattress.
2. Suspend a 10lb sphere (9” diameter) such that it is centered 39” directly above the Approximate Center.
3. Suspend a measurement scale, such as a measuring tape, vertically above the mattress such that it touches the mattress at a point 9” away from the Approximate Center towards the foot of the bed.
4. Wait 1 minute for the system to reach relative static equilibrium.
5. Release the sphere such that it lands on the Approximate center of the mattress.
6. Place the DSLR video camera, mounted on a static tripod located 6” from the mid-point of the foot of the bed such that its line of sight is parallel to the top surface of the mattress, and that it is focussed on the vertically suspended measurement scale.
7. Wait 1 minute for the system to reach static equilibrium.
8. Begin recording on the video camera.
9. Release the sphere and wait 5 seconds.
10. Review the video and determine the maximum rebound point - that is, the point on the scale reached by the bottom of the weight on its first rebound (if it rebounds).
11. Repeat 3 times and take an average.