Review and Comparison of Vibration Qualification Testing Methods
Extended Appendix

Abstract

This document contains response and force PSD plots for the various control cases from the paper. For each response figure, the actual environment is in black, and the lab result is in blue. The forces are shown in red. Shaker cases 1 through 4 use the Stool Plate or Stool Plate Interface Plate Systems, so the shaker and accelerometer numbers reference those corresponding to these systems. Shaker cases 5 and 6 use the wedding cake system and its corresponding shaker and accelerometer numbers. The shaker and accelerometer locations are reproduced in Figs. 1 and 2, and the tables from the paper are reproduced here as well for convenience.

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Table 1: Shaker Locations and Next Assembly for Simulated Tests, where "SP" means "Stool and Plate", "IFP" means "Interface Plate", and "WC" means "Wedding Cake"

Case Number	Support Structure Included (Constrained DOF)	Shaker Numbers
1	Plate (X,Y,RX,RY,RZ)	SP 1
2	Plate (RX,RY,RZ)	SP 1,5,6
3	Plate	SP 1:6
4	Plate + IFP	SP 1:6
5	Full WC	WC 1:10
6	Full WC	WC 1:13

Table 2: Accelerometer Locations for Simulated Tests

Case Number	Accelerometer Numbers SP / SP-IFP	Accelerometer Numbers WC
1	Launch 1	1
2	1	1
3	1-3	1-3
4	1-5	1, 6-8
5	1-7	1, 6-8, 10, 11

Table 3: RMS dB errors across all reference channels and the three reference launch (z) channels for simulated SDOF tests.

NA (No. Const)	**No. of Shakers**	**Shaker Case**	**DUT Error (dB) w/ No Noise in Environment**				
Plate (5)	1	1	95.2	95.2	94.3	92.7	92.8
Plate (5)-Z	1	1	11.7	11.7	25.8	16.1	19.1
		Accel Case	1	2	3	4	5
		No. Chans (Locs)	1 (Plate)	3 (Plate)	9 (Plate)	15 (Plate)	15 (Plate) + 6 (DUT)

Table 4: RMS dB Errors for Simulated Tests with Noise-free Environment

NA (No. Const)	**No. of Shakers**	**Shaker Case**	**DUT Error (dB) w/ No Noise in Environment**				
Plate (3)	3	2	111.7	28.6	37.8	33.1	30.8
Plate (0)	6	3	46.1	26.9	10.5	11.6	9.9
Plate and IFP (0)	6	4	44.1	29.9	9.5	11.7	9.2
Full WC (0)	10	5	38.9	30.2	8.1	8.2	6.8
Full WC (0)	13	6	41.3	23	18.9	7.1	0
		Accel Case	1	2	3	4	5
		No. Chans (Locs)	1 (Plate)	3 (Plate)	9 (Plate)	15 (Plate) or 12 (WC)	12-15 (Plate / WC) + 6 (DUT)

Table 5: Simulated Test Results for Noisy Environment

NA (No. Const)	No. of Shakers	Shaker Case	DUT Error w/ Noise in the Environment				
Plate (3)	3	2	111.7	28.3	33.5	30.4	27.4
Plate (0)	6	3	46.1	23.8	11.7	9.6	7.1
Plate and IFP (0)	6	4	44.1	27	11.5	9.7	7.1
Full WC (0)	10	5	38.9	25.9	23.6	11.7	8.3
Full WC (0)	13	6	41.3	21.7	59.6	81.9	7.5
		Accel Case	1	2	3	4	5
		No. Chans (Locs)	1 (Plate)	3 (Plate)	9 (Plate)	15 (Plate) or 12 (WC)	12-15 (Plate / WC) + 6 (DUT)

Table 6: Control FRF RMS Condition Numbers for Noisy Environment

NA (No. Const)	No. of Shakers	Shaker Case	Control FRF Condition Number				
Plate (3)	3	2	1	7.8	7.8	7.8	6.5
Plate (0)	6	3	1	12	78.1	40	23.5
Plate and IFP (0)	6	4	1	7.8	26.8	21.6	13.1
Full WC (0)	10	5	1	9.4	1.03E+05	2496	2383
Full WC (0)	13	6	1	9.9	8.90E+04	1.30E+06	2791
		Accel Case	1	2	3	4	5
		No. Chans (Locs)	1 (Plate)	3 (Plate)	9 (Plate)	15 (Plate) or 12 (WC)	12-15 (Plate / WC) + 6 (DUT)

Table 7: Maximum RMS Required Shaker Forces in Noisy Environment Simulation

NA (No. Const)	No. of Shakers	Shaker Case	Max RMS Forces w/ Noise in the Environment				
Plate (3)	3	2	63.9	183.9	118.5	88.3	65.3
Plate (0)	6	3	7.4	19.8	73.8	66	66.8
Plate and IFP (0)	6	4	23.3	31.7	130	129.3	134.6
Full WC (0)	10	5	5.6	16.1	1.85E+05	3917	3661
Full WC (0)	13	6	4.6	9.1	1.20E+05	3.70E+05	3997
		Accel Case	1	2	3	4	5
		No. Chans (Locs)	1 (Plate)	3 (Plate)	9 (Plate)	15 (Plate) or 12 (WC)	12-15 (Plate / WC) + 6 (DUT)

Table 8: Simulated Test Errors for Noisy Environment with Condition Number Threshold on Control FRF of 0.01

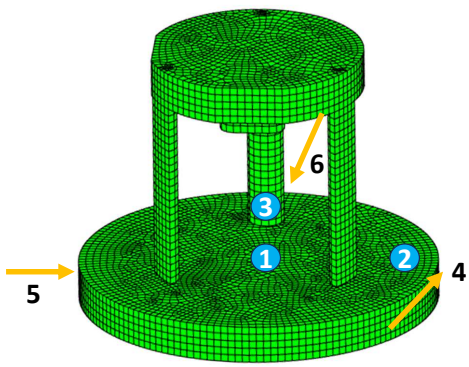
NA (No. Const)	No. of Shakers	Shaker Case	DUT Error w/ Noise and CN = 0.01				
Plate (3)	3	2	111.7	28.3	33.5	30.4	27.4
Plate (0)	6	3	46.1	23.8	11.1	9.2	7.3
Plate and IFP (0)	6	4	44.1	27	11.2	9.4	7.1
Full WC (0)	10	5	38.9	25.9	10.7	11.4	8.5
Full WC (0)	13	6	41.3	21.7	17.9	24.3	8.1
		Accel Case	1	2	3	4	5
		No. Chans (Locs)	1 (Plate)	3 (Plate)	9 (Plate)	15 (Plate) or 12 (WC)	12-15 (Plate / WC) + 6 (DUT)

Table 9: Forces for Noisy Simulation with CN = 0.01

NA (No. Const)	No. of Shakers	Shaker Case	Max RMS Forces w/ Noise and CN = 0.01				
Plate (3)	3	2	63.9	183.9	118.5	88.3	65.3
Plate (0)	6	3	7.4	19.8	62.9	64.3	66.8
Plate and IFP (0)	6	4	23.3	31.7	125.5	128.1	134.6
Full WC (0)	10	5	5.6	16.1	30.8	73	73.2
Full WC (0)	13	6	4.6	9.1	28.2	56.2	69.4
		Accel Case	1	2	3	4	5
		No. Chans (Locs)	1 (Plate)	3 (Plate)	9 (Plate)	15 (Plate) or 12 (WC)	12-15 (Plate / WC) + 6 (DUT)

Figure 1: Stool-Plate, Stool-Plate-IFP, and Full System candidate shaker locations, where a circle represents a shaker in the launch direction.

(a) Stool-Plate and Stool-Plate-IFP Shaker Locations



(b) Wedding Cake Shaker Locations

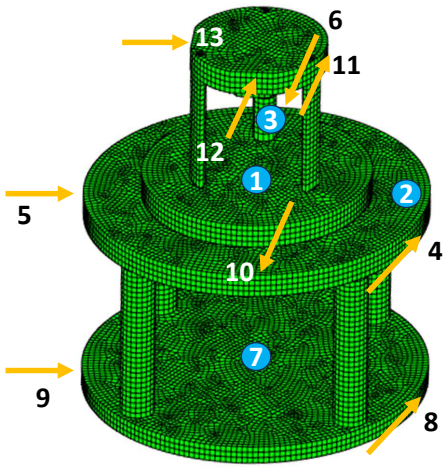
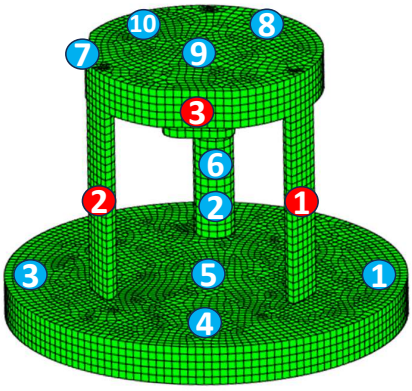
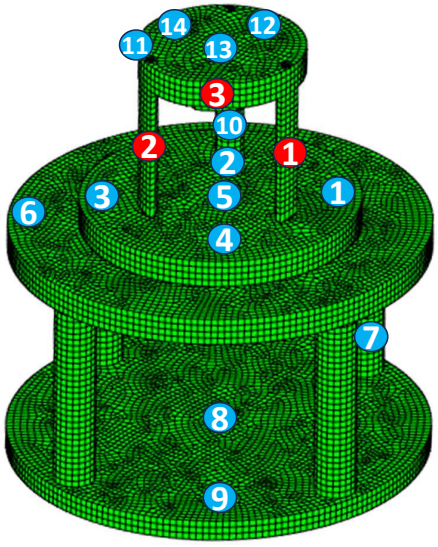


Figure 2: Stool-Plate, Stool-Plate-IFP, and Full System candidate triaxial accelerometer locations, with control accelerometers in blue and reference accelerometers in red.

(a) Stool-Plate and Stool-Plate-IFP Accelerometer Locations



(b) Wedding Cake Accelerometer Locations



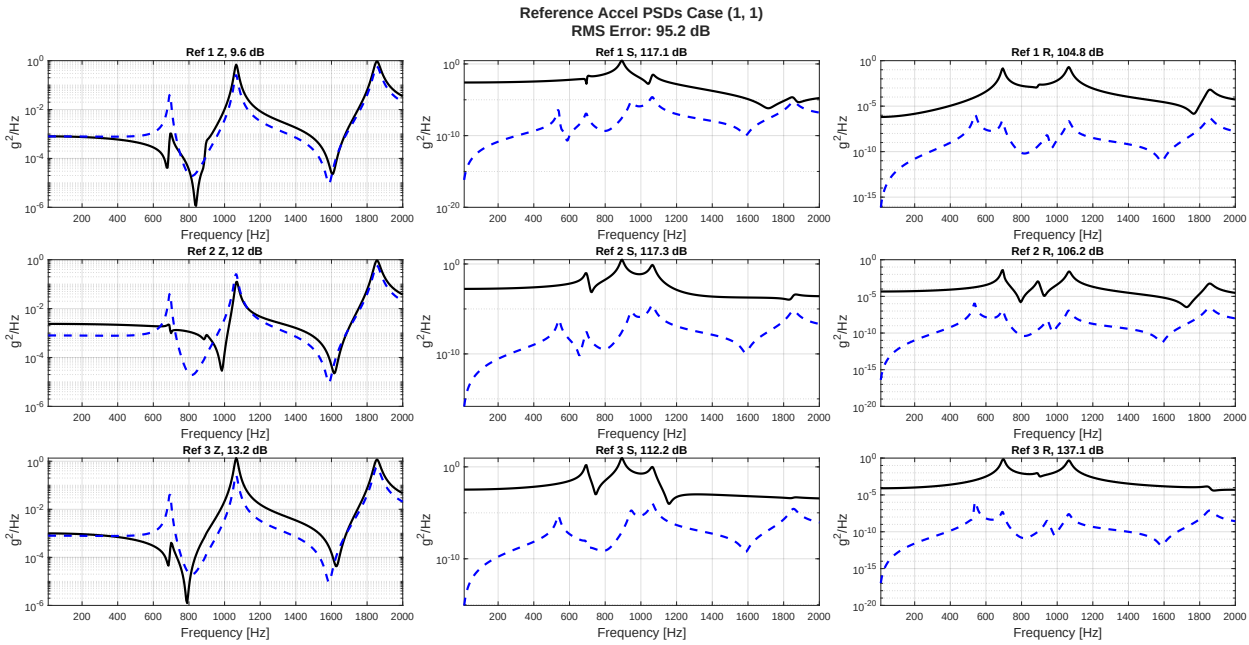


Figure 3: Reference Accels, No Noise, Case (1,1)

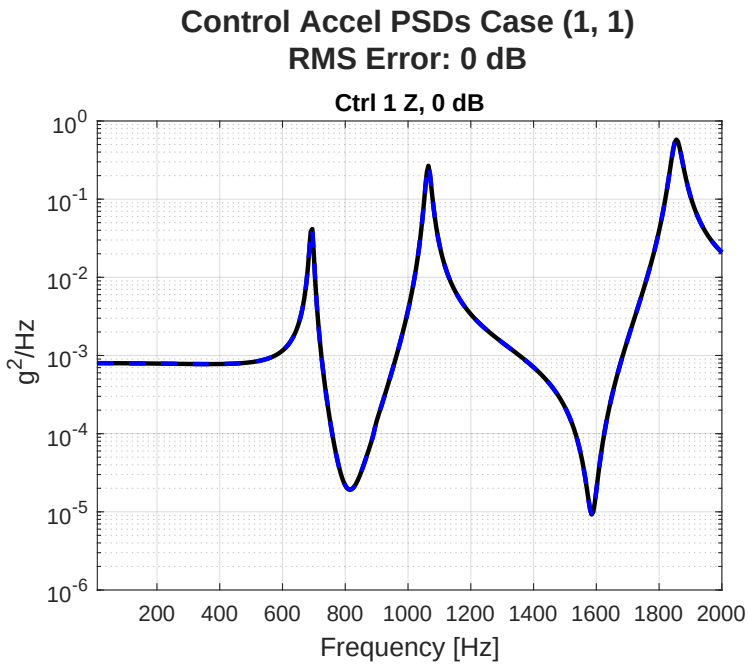


Figure 4: Control Accels, No Noise, Case (1,1)

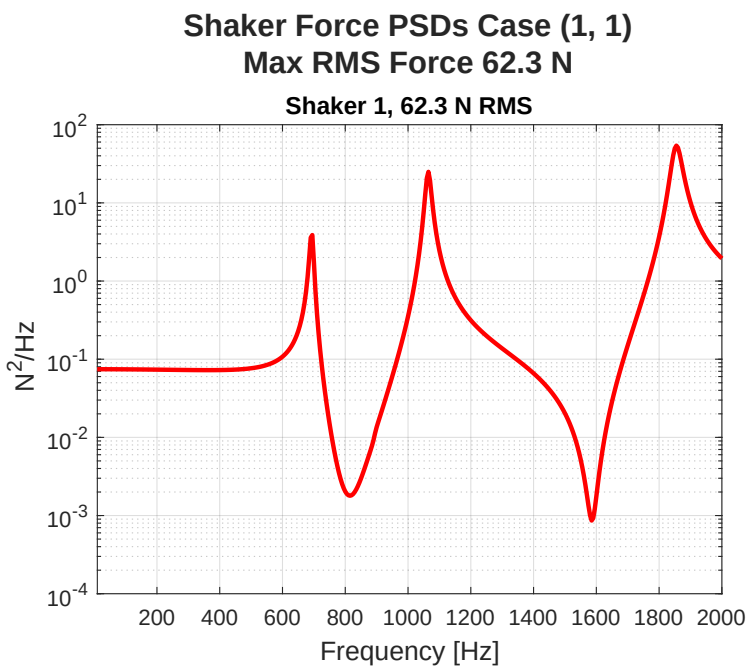


Figure 5: Shaker Forces, No Noise, Case (1,1)

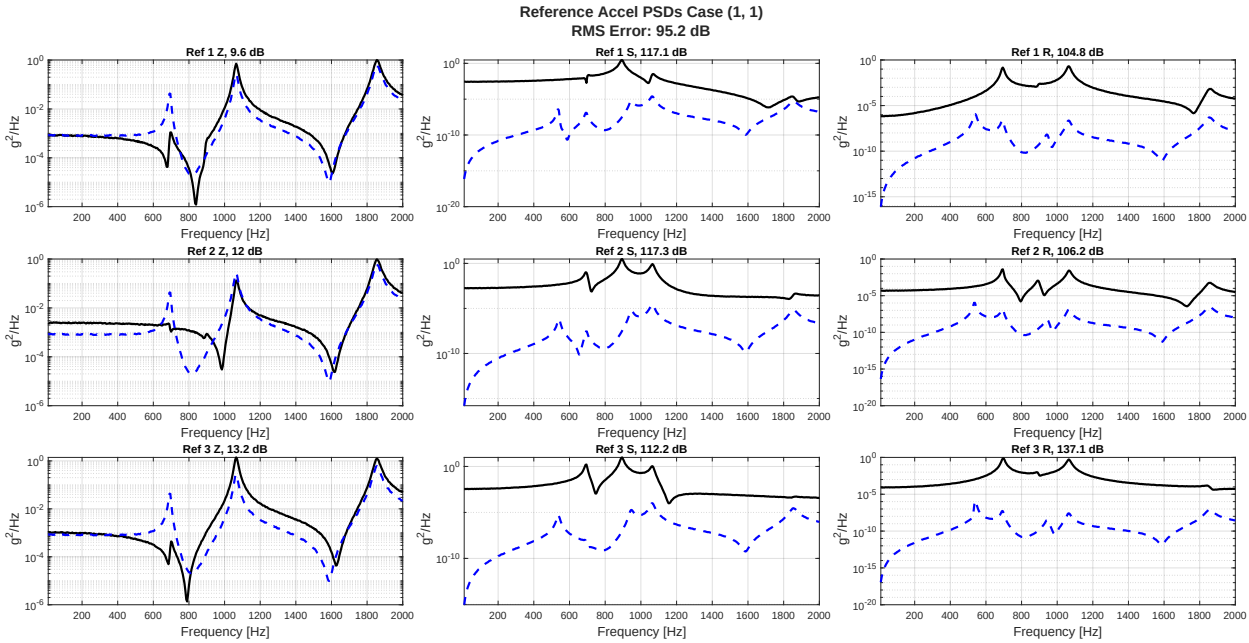


Figure 6: Reference Accels, Noise, No CN, Case (1,1)

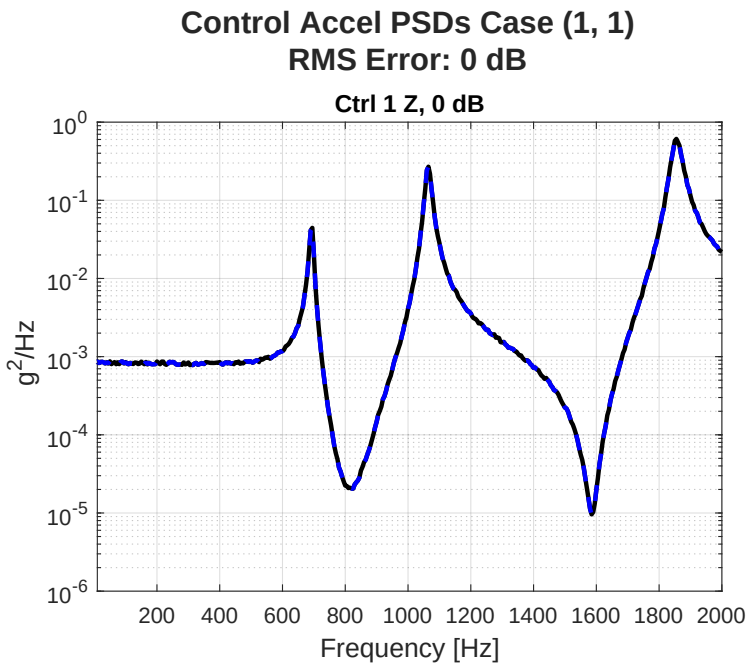


Figure 7: Control Accels, Noise, No CN, Case (1,1)

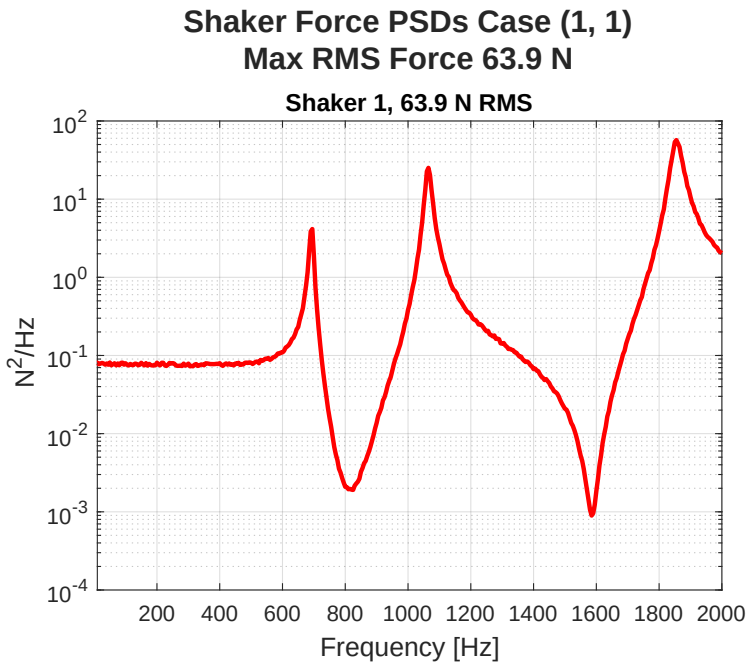


Figure 8: Shaker Forces, Noise, No CN, Case (1,1)

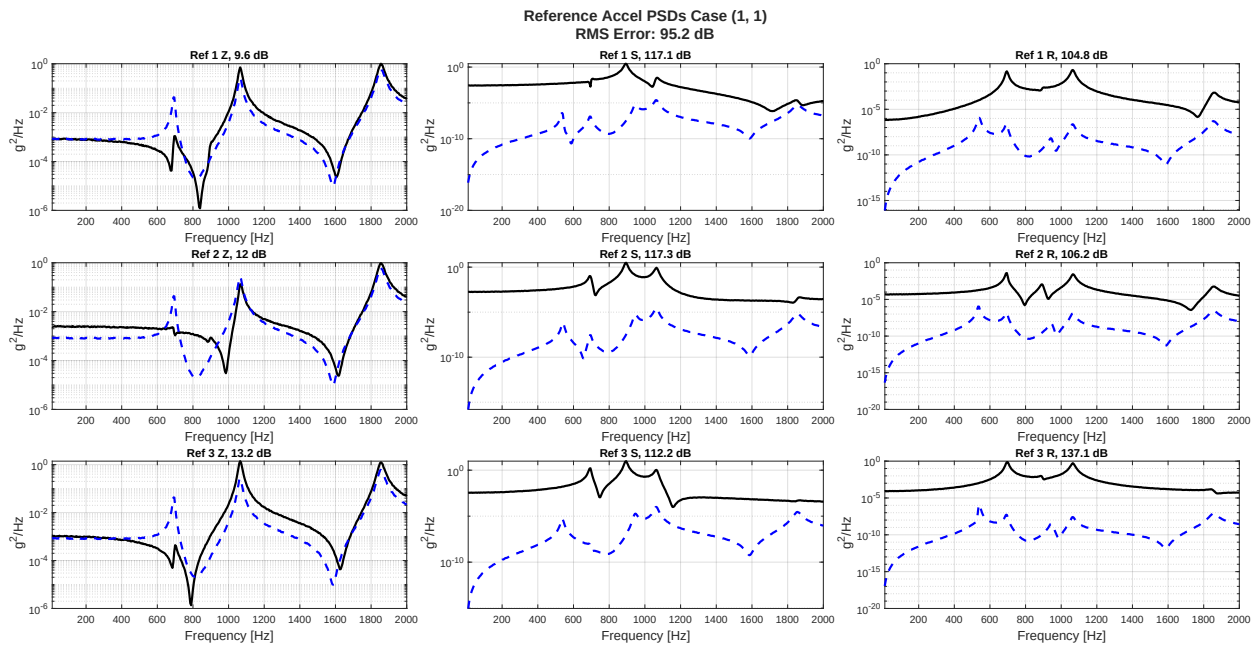


Figure 9: Reference Accels, Noise, with CN, Case (1,1)

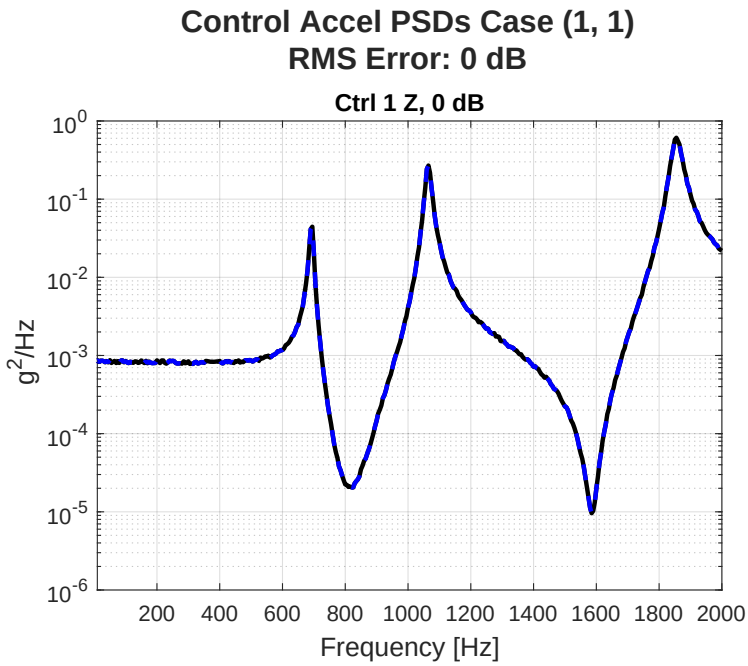


Figure 10: Control Accels, Noise, with CN, Case (1,1)

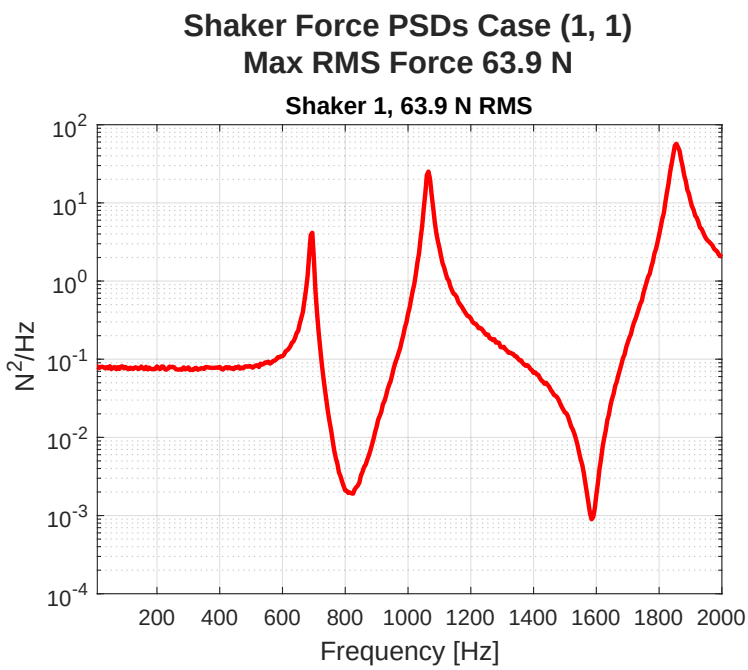


Figure 11: Shaker Forces, Noise, with CN, Case (1,1)

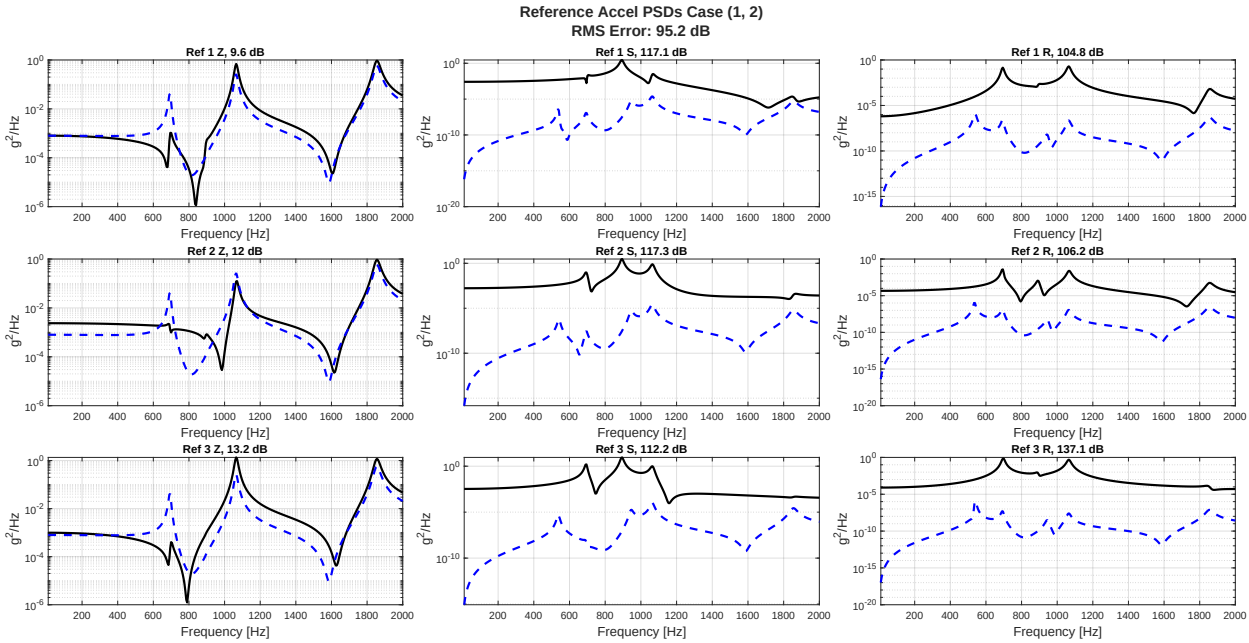


Figure 12: Reference Accels, No Noise, Case (1,2)

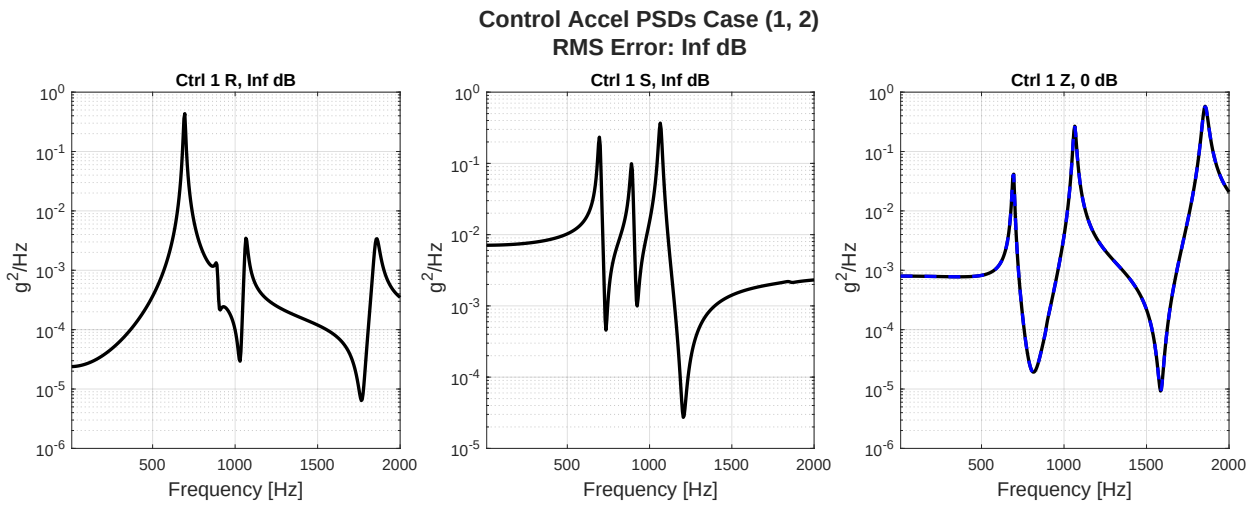


Figure 13: Control Accels, No Noise, Case (1,2)

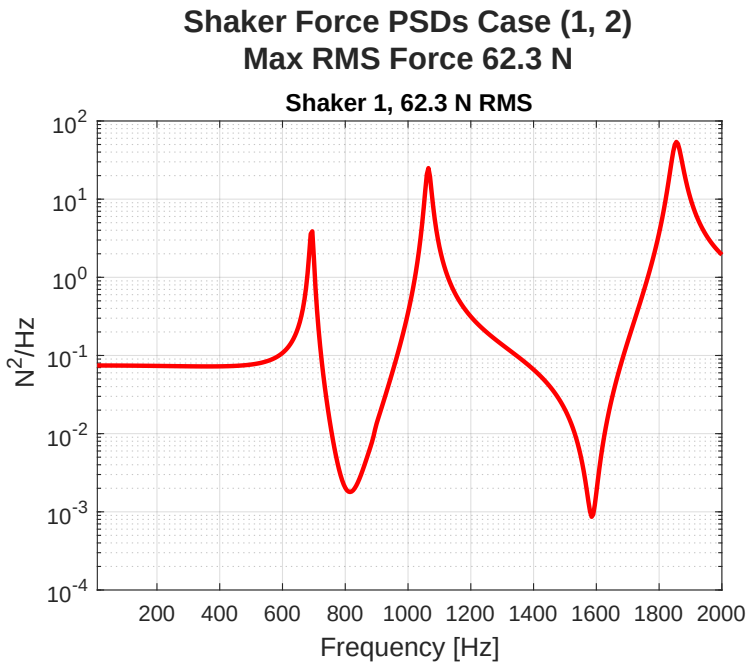


Figure 14: Shaker Forces, No Noise, Case (1,2)

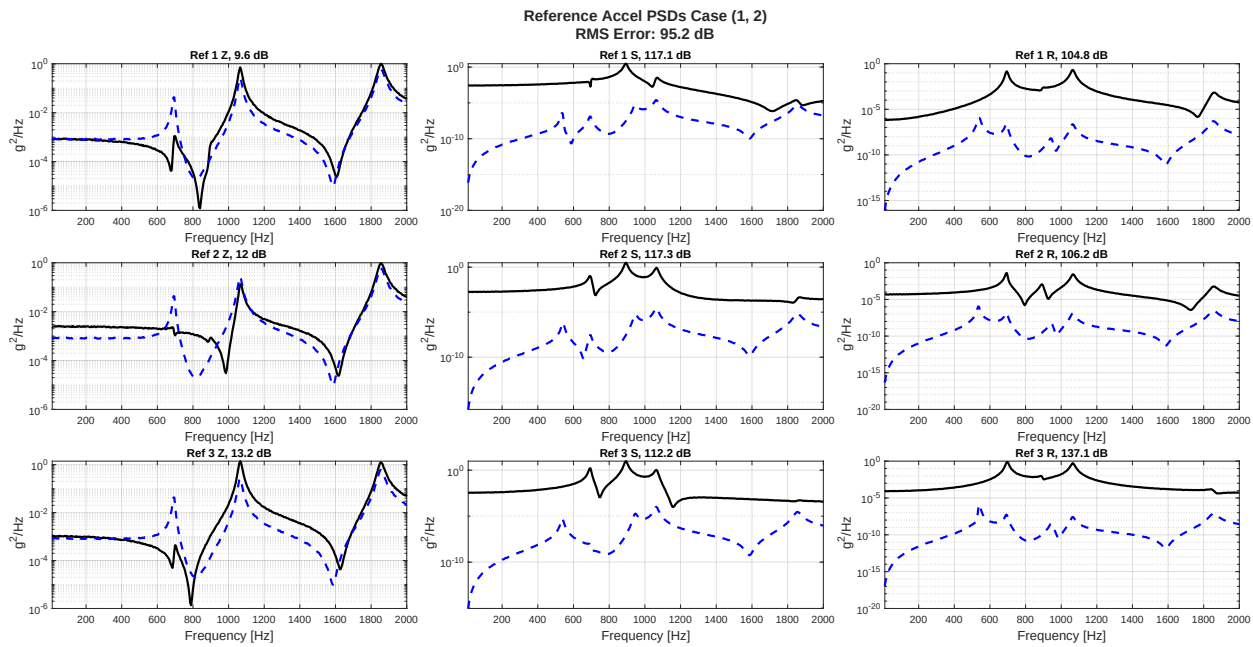


Figure 15: Reference Accels, Noise, No CN, Case (1,2)

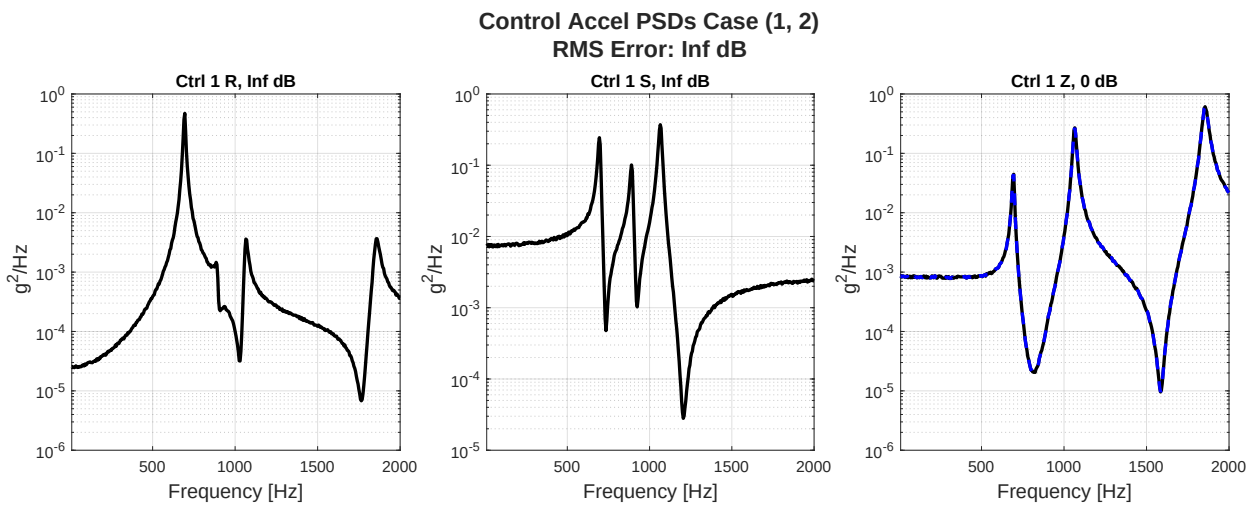


Figure 16: Control Accels, Noise, No CN, Case (1,2)

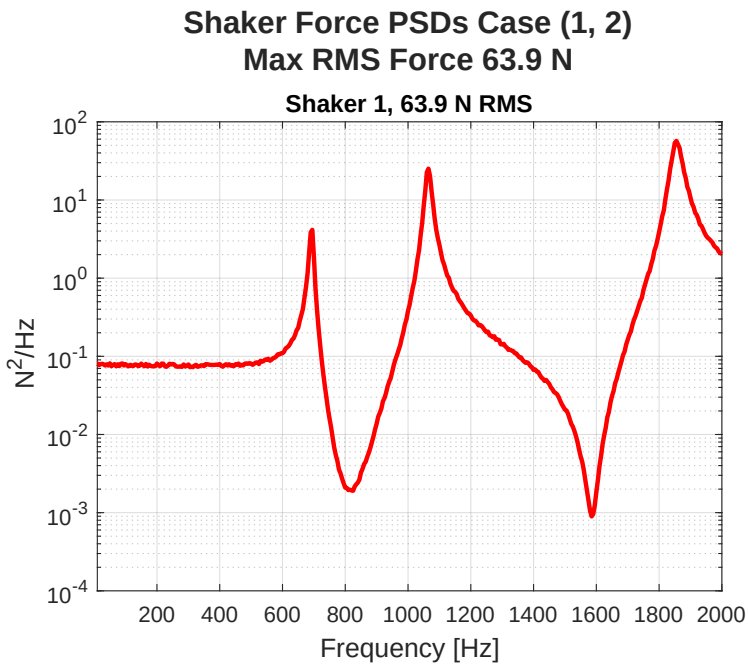


Figure 17: Shaker Forces, Noise, No CN, Case (1,2)

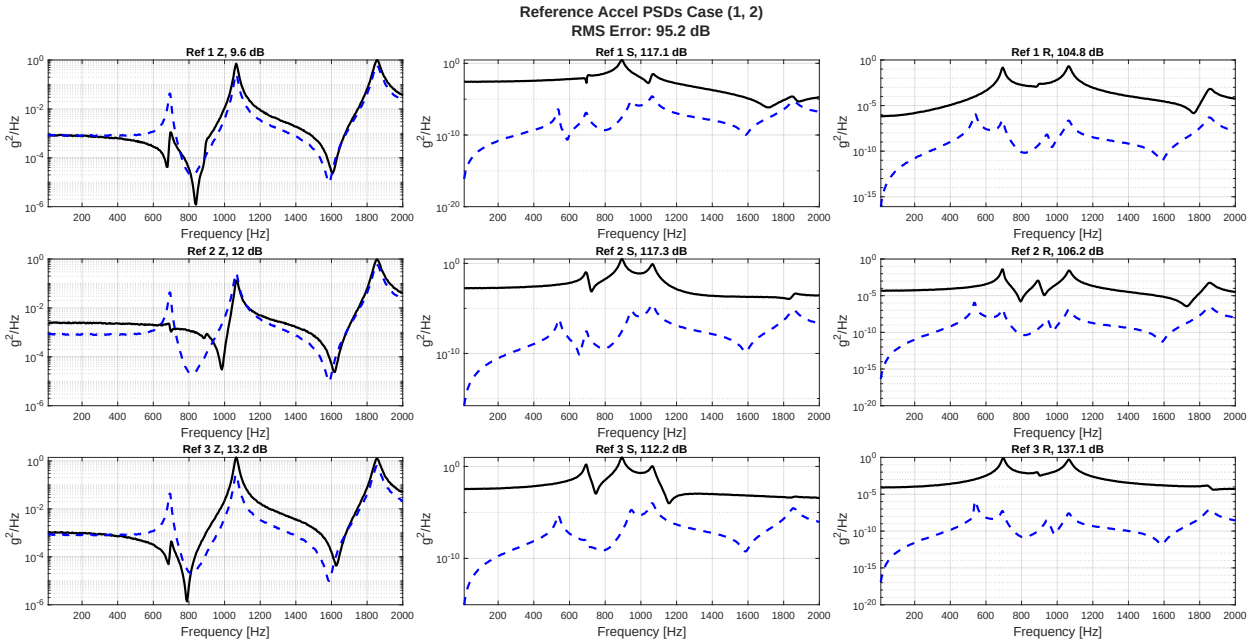


Figure 18: Reference Accels, Noise, with CN, Case (1,2)

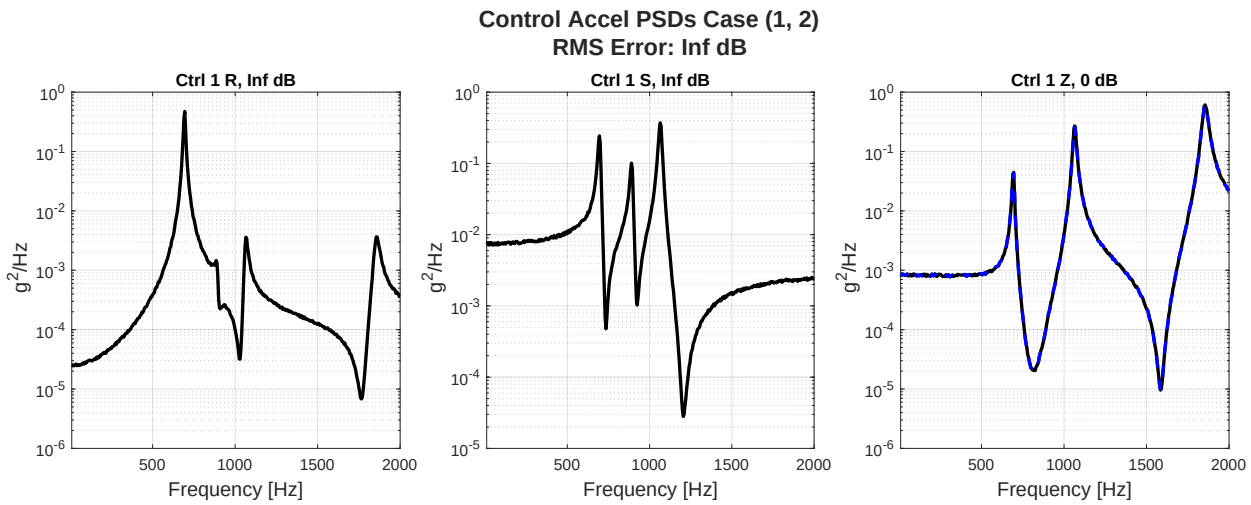


Figure 19: Control Accels, Noise, with CN, Case (1,2)

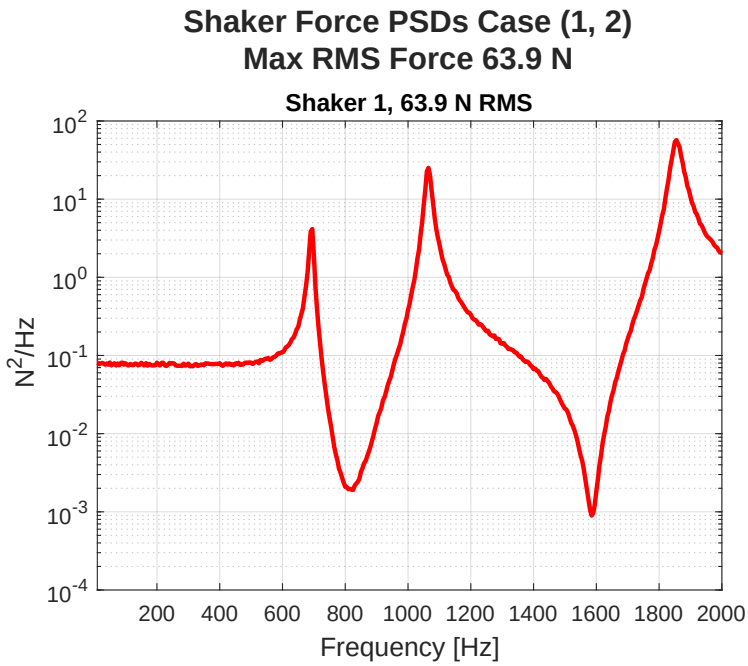


Figure 20: Shaker Forces, Noise, with CN, Case (1,2)

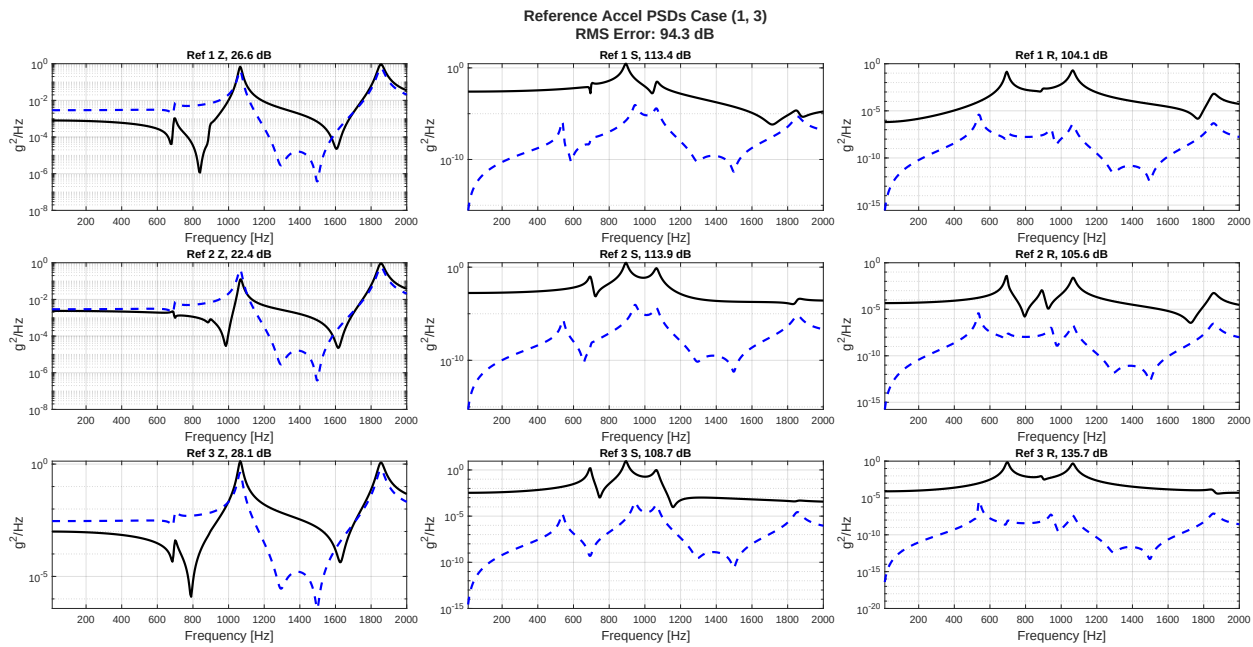


Figure 21: Reference Accels, No Noise, Case (1,3)

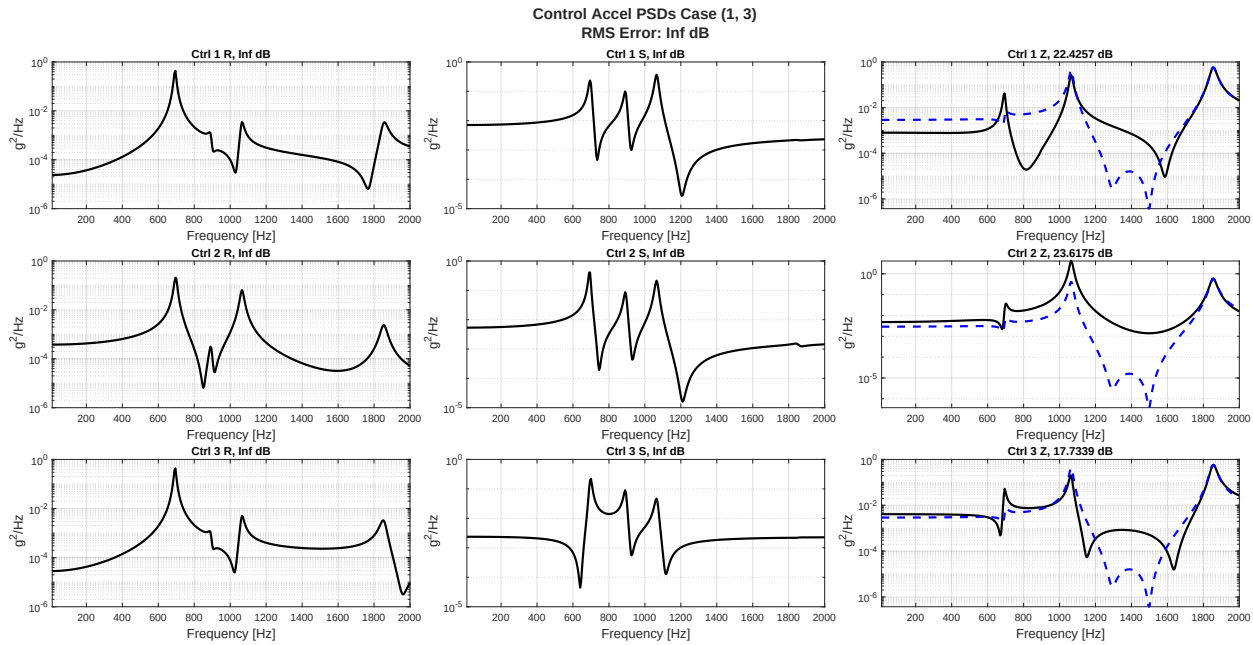


Figure 22: Control Accels, No Noise, Case (1,3)

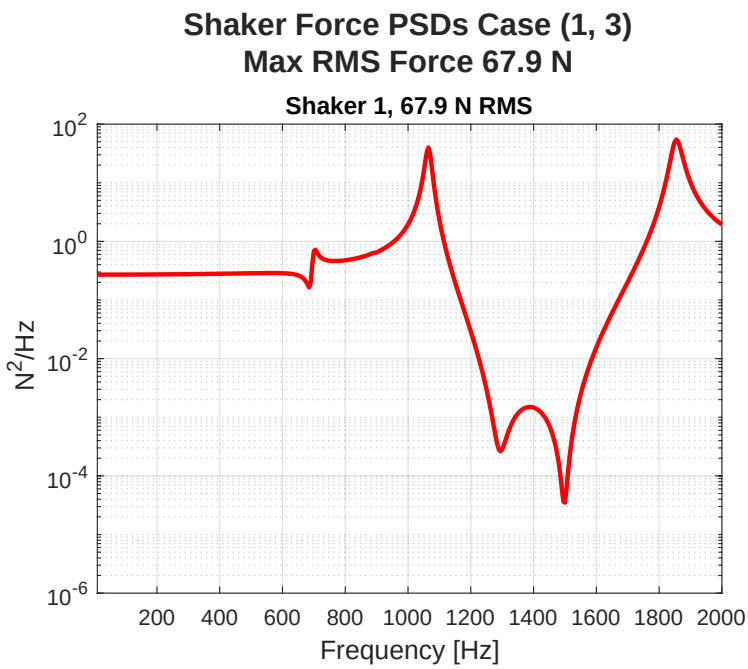


Figure 23: Shaker Forces, No Noise, Case (1,3)

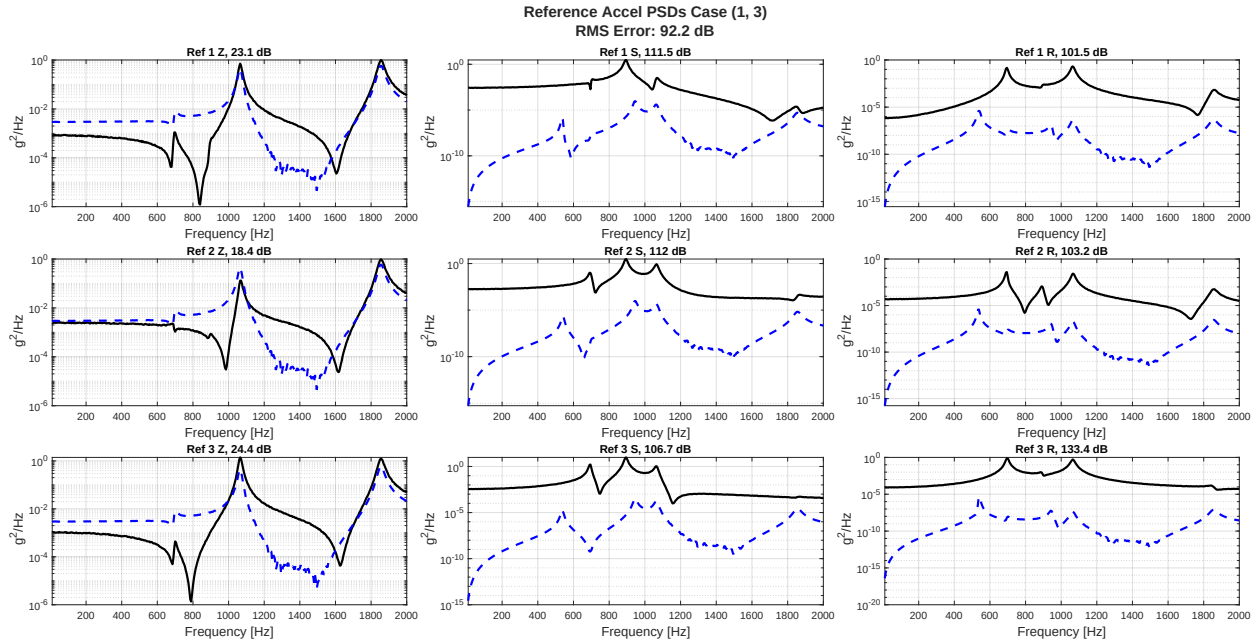


Figure 24: Reference Accels, Noise, No CN, Case (1,3)

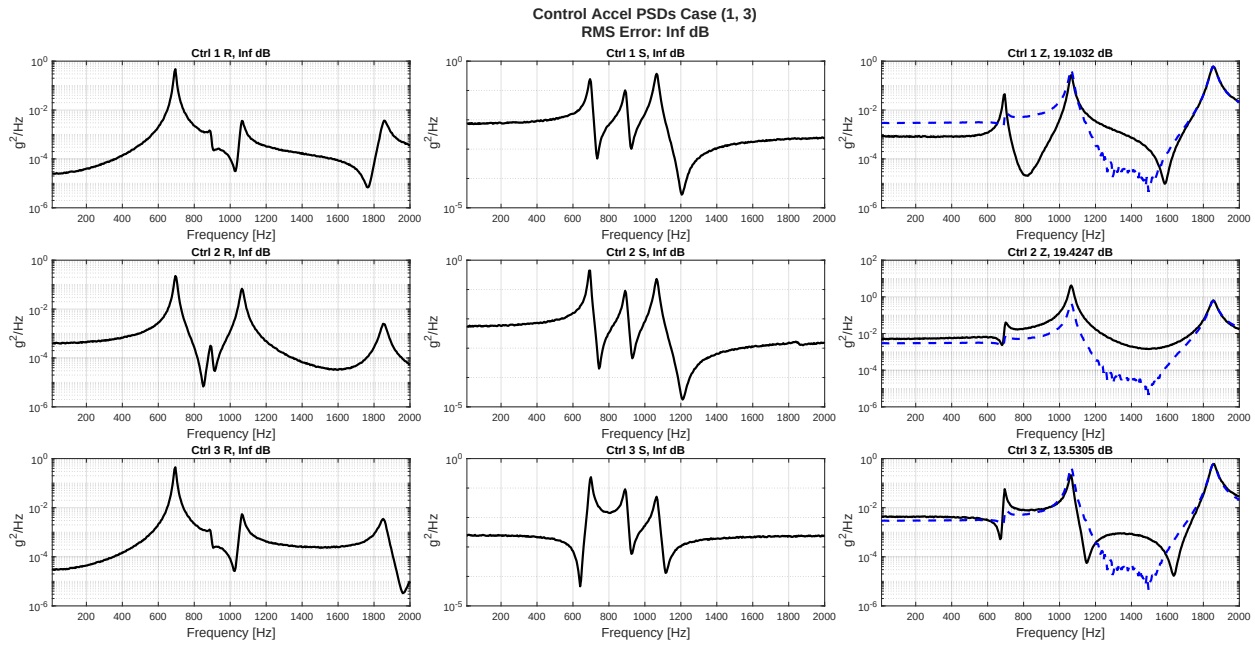


Figure 25: Control Accels, Noise, No CN, Case (1,3)

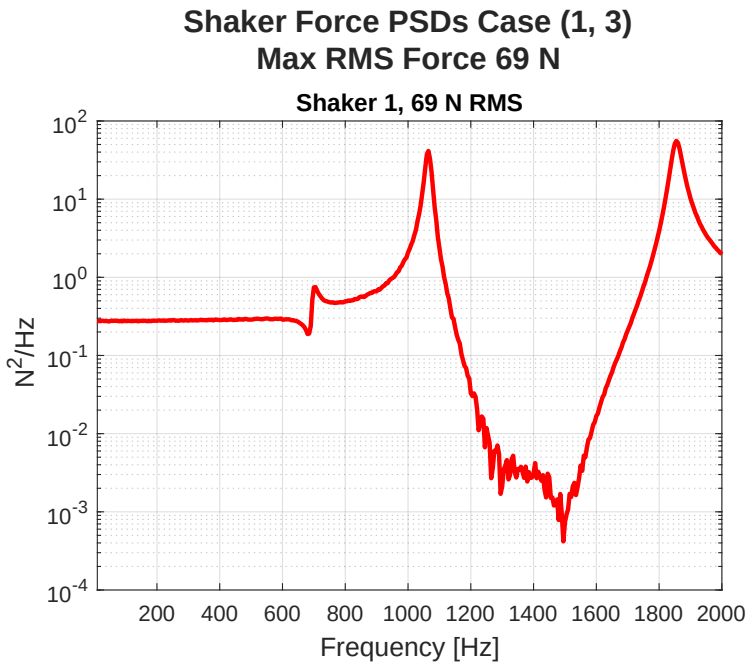


Figure 26: Shaker Forces, Noise, No CN, Case (1,3)

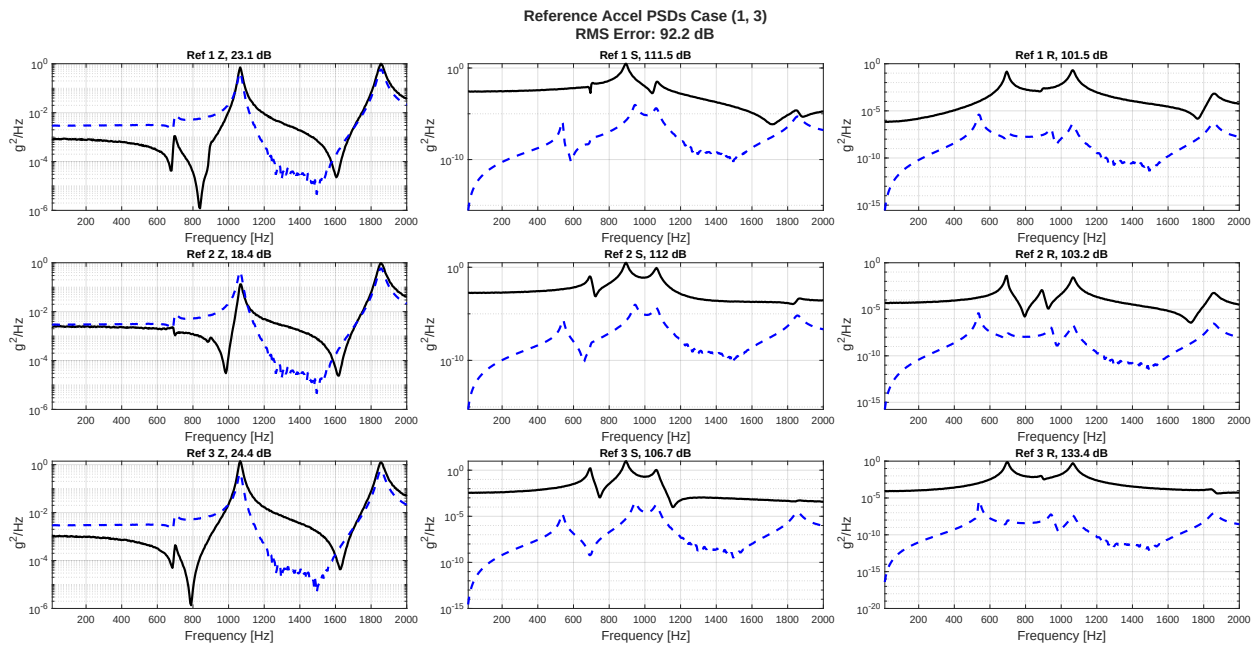


Figure 27: Reference Accels, Noise, with CN, Case (1,3)

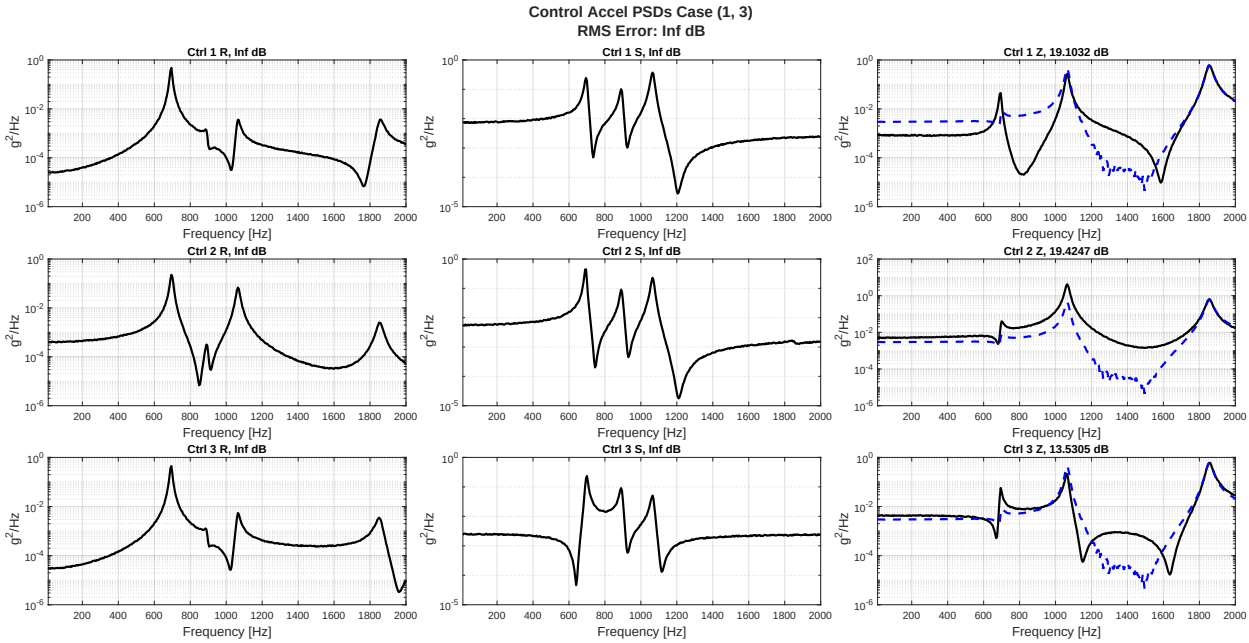


Figure 28: Control Accels, Noise, with CN, Case (1,3)

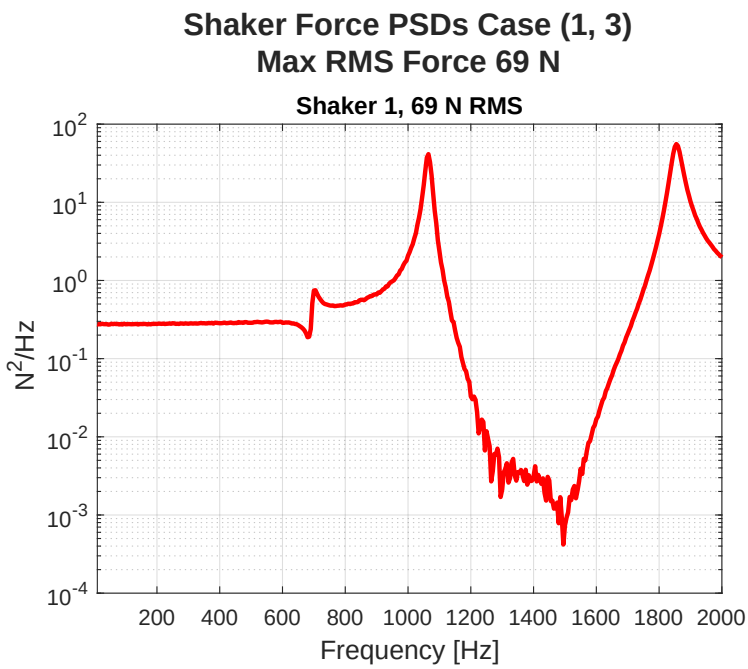


Figure 29: Shaker Forces, Noise, with CN, Case (1,3)

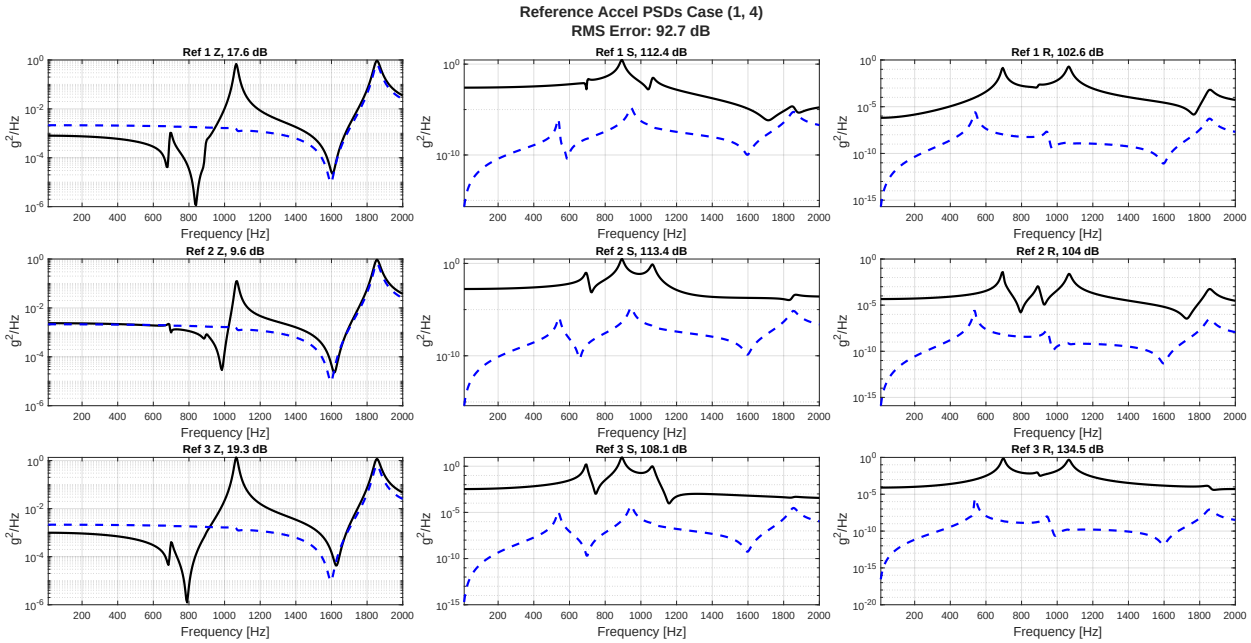


Figure 30: Reference Accels, No Noise, Case (1,4)

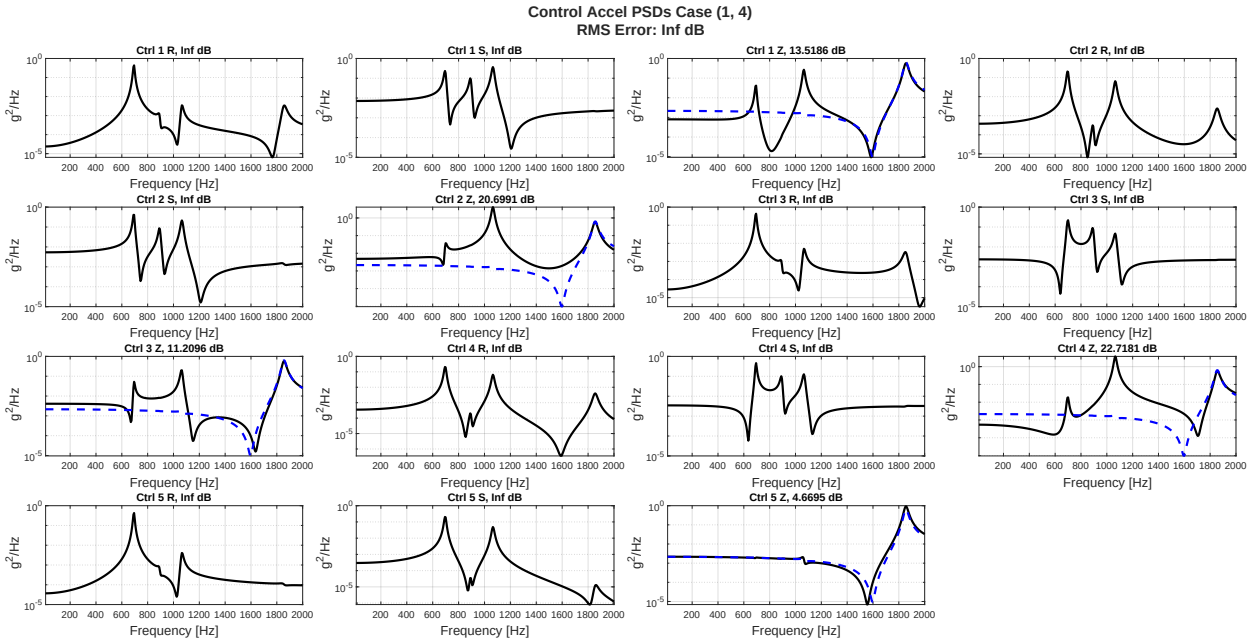


Figure 31: Control Accels, No Noise, Case (1,4)

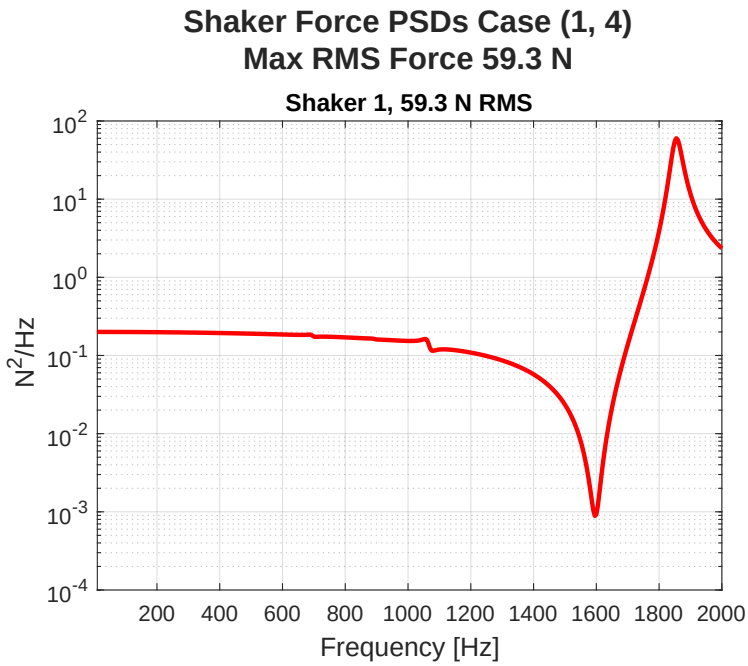


Figure 32: Shaker Forces, No Noise, Case (1,4)

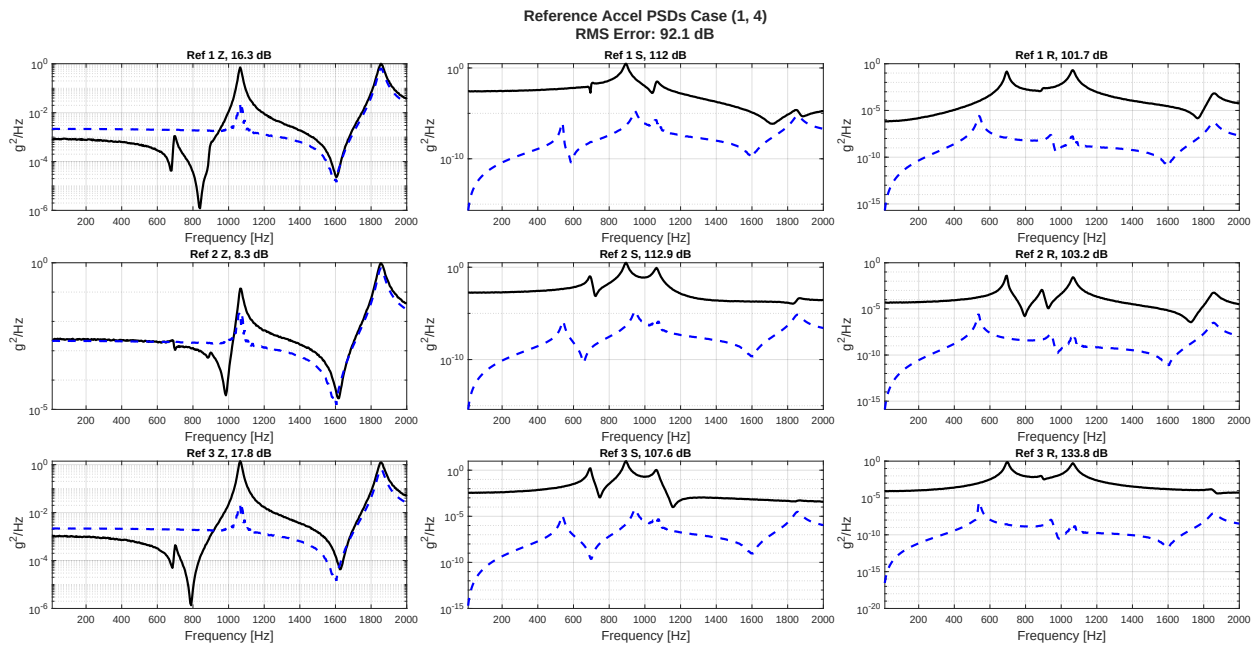


Figure 33: Reference Accels, Noise, No CN, Case (1,4)

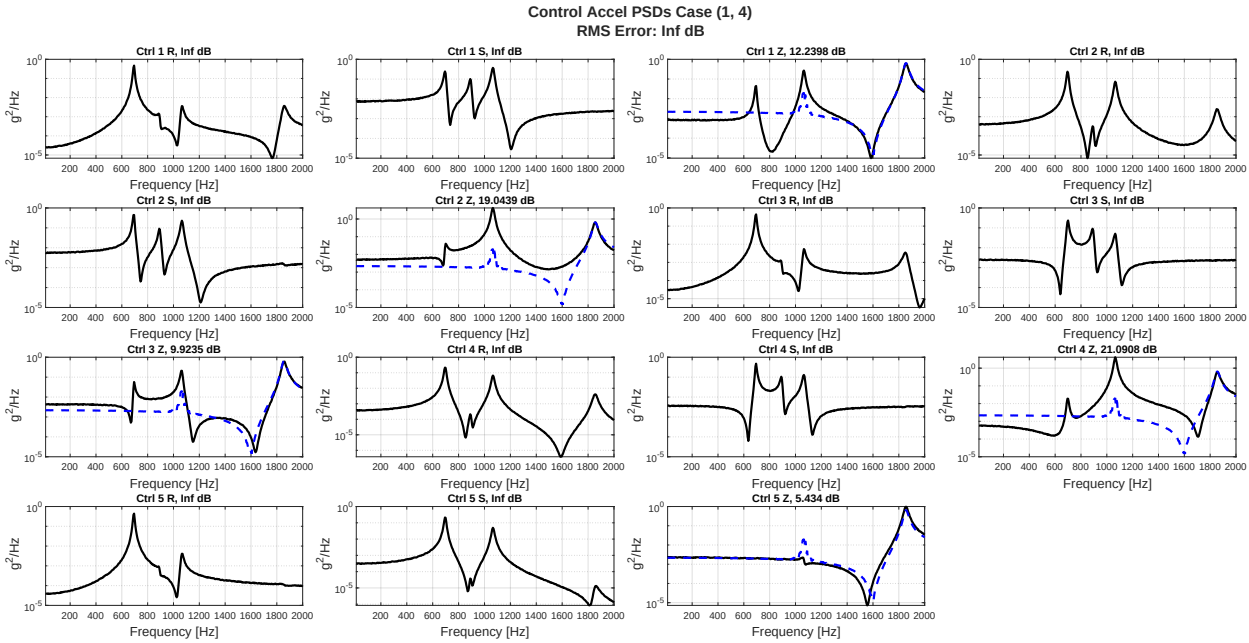


Figure 34: Control Accels, Noise, No CN, Case (1,4)

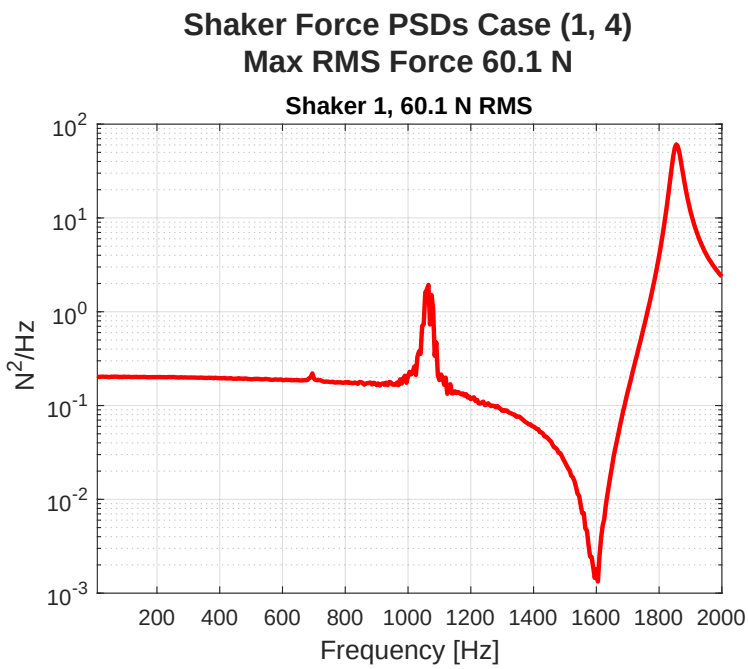


Figure 35: Shaker Forces, Noise, No CN, Case (1,4)

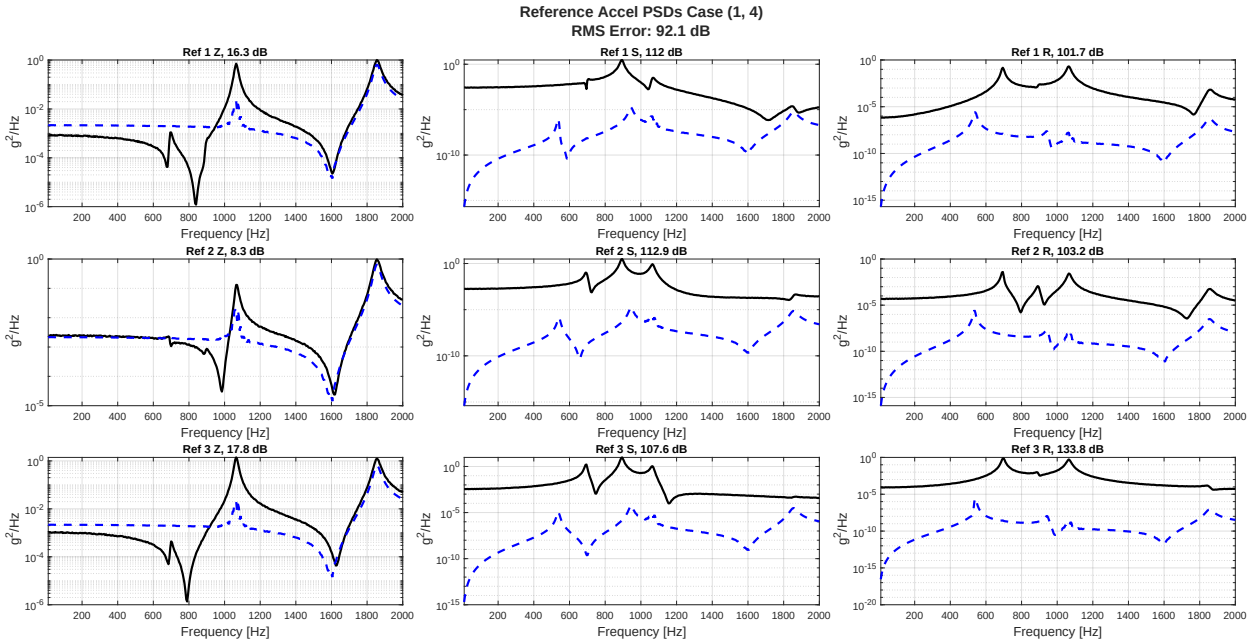


Figure 36: Reference Accels, Noise, with CN, Case (1,4)

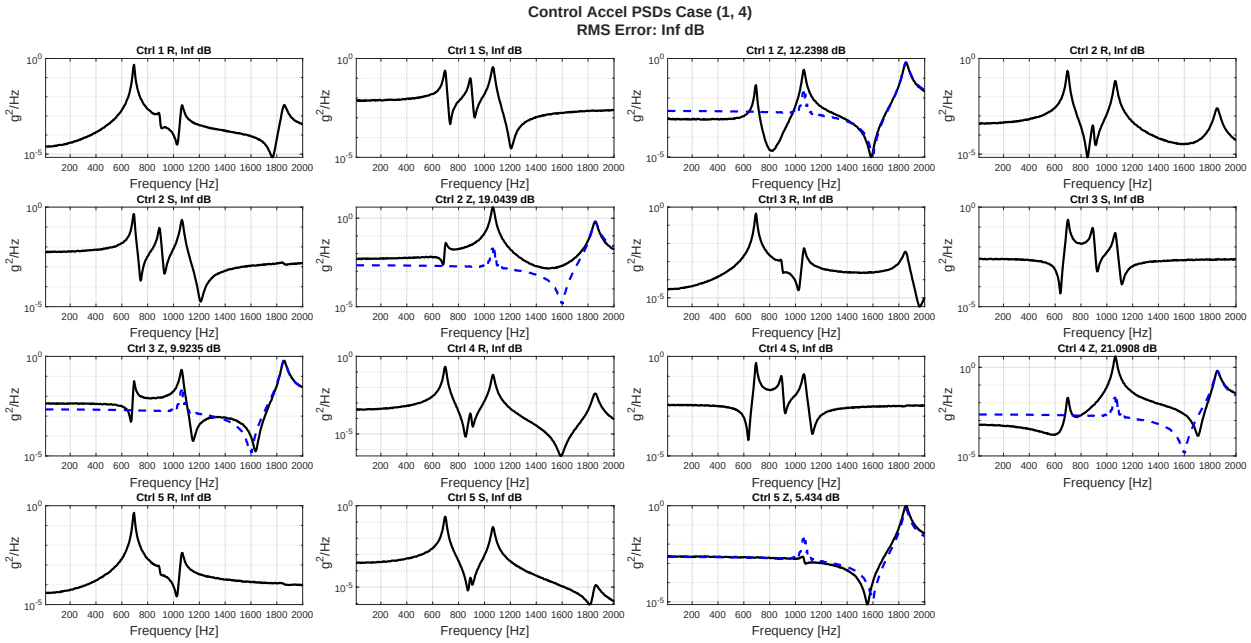


Figure 37: Control Accels, Noise, with CN, Case (1,4)

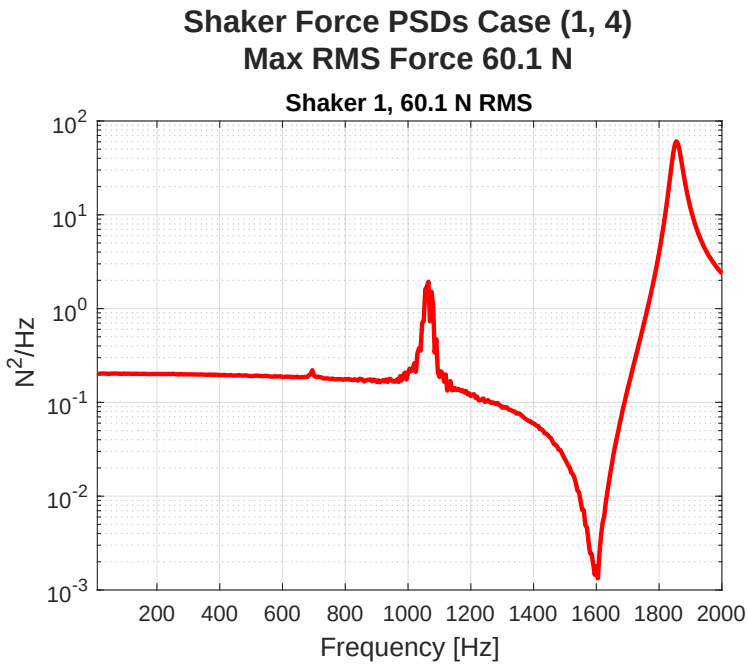


Figure 38: Shaker Forces, Noise, with CN, Case (1,4)

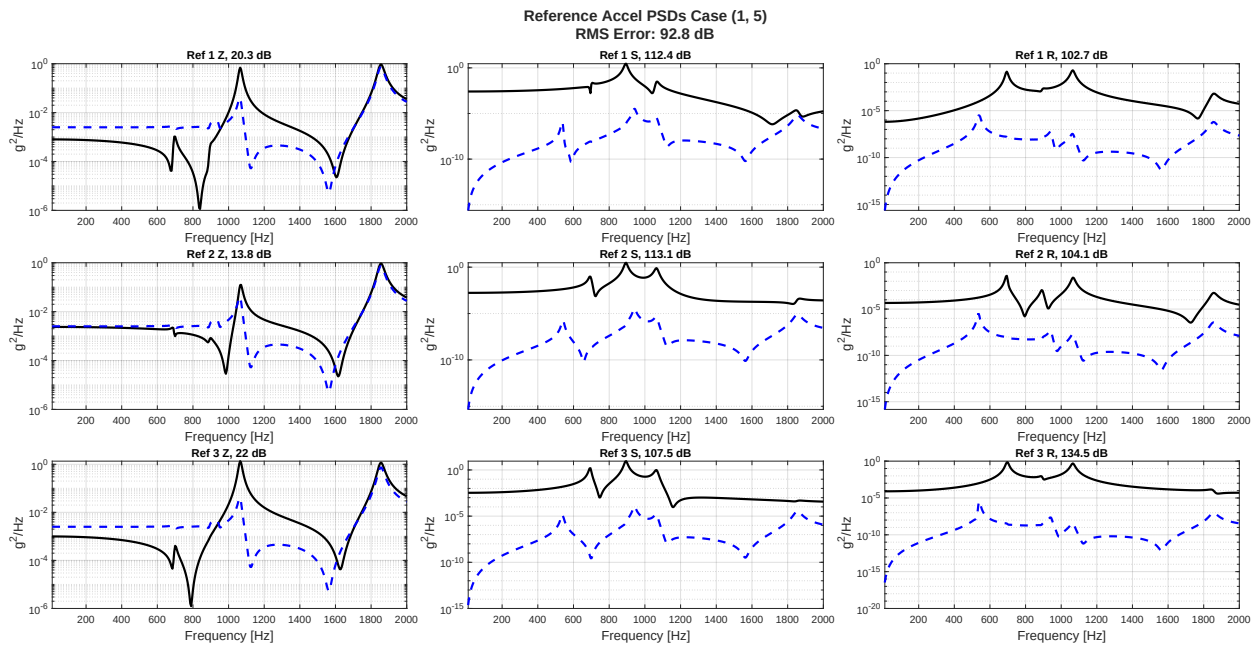


Figure 39: Reference Accels, No Noise, Case (1,5)

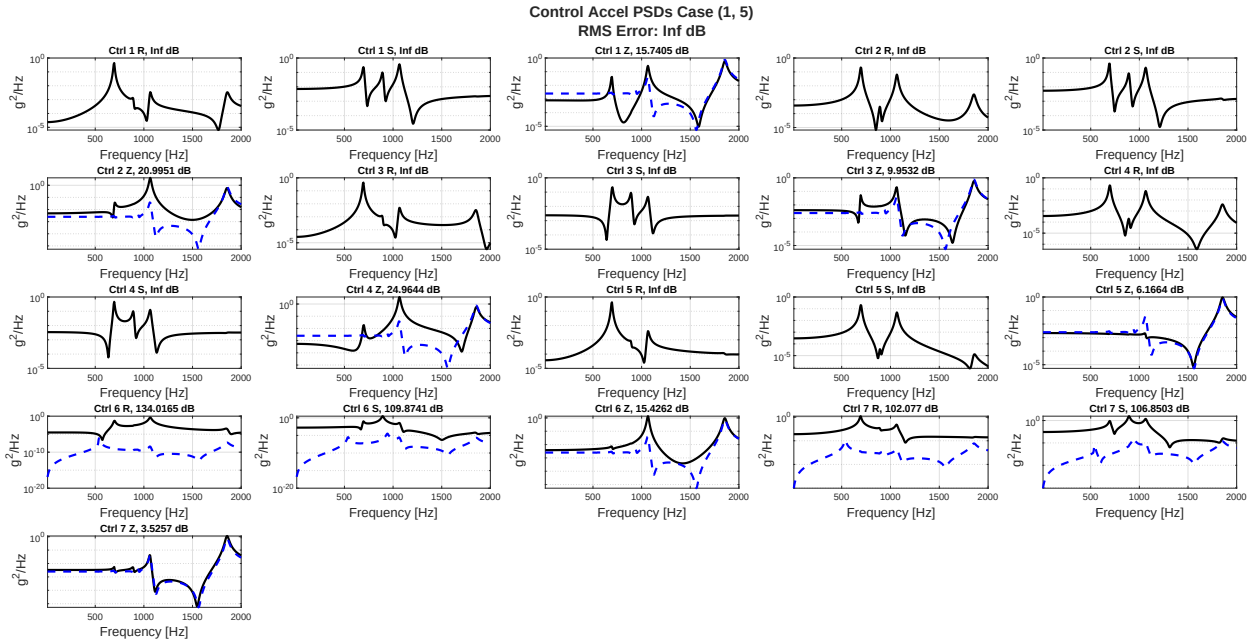


Figure 40: Control Accels, No Noise, Case (1,5)

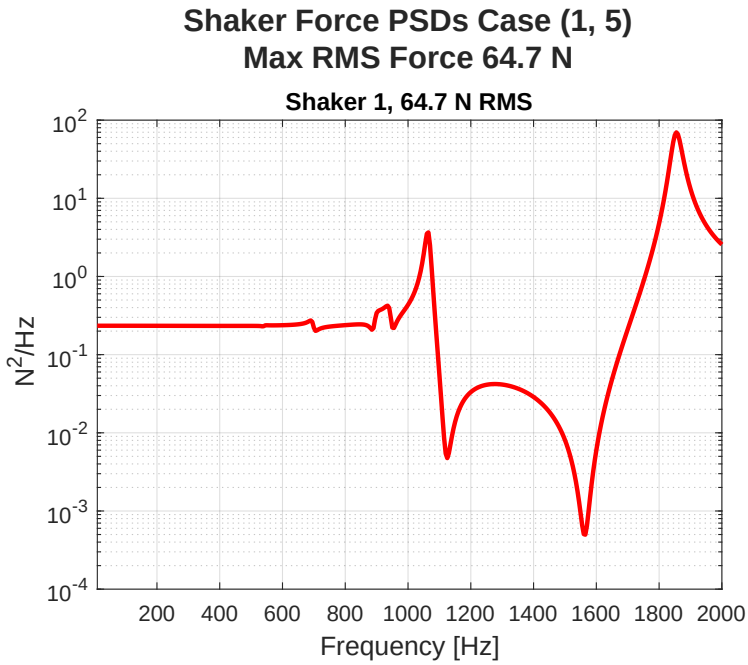


Figure 41: Shaker Forces, No Noise, Case (1,5)

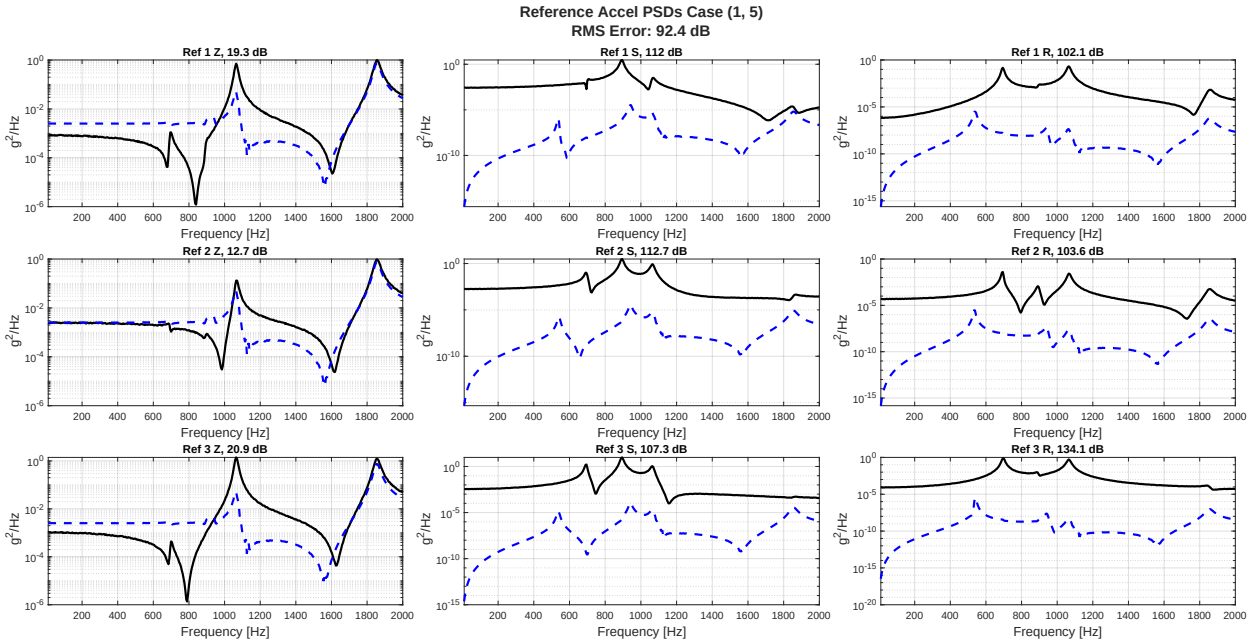


Figure 42: Reference Accels, Noise, No CN, Case (1,5)

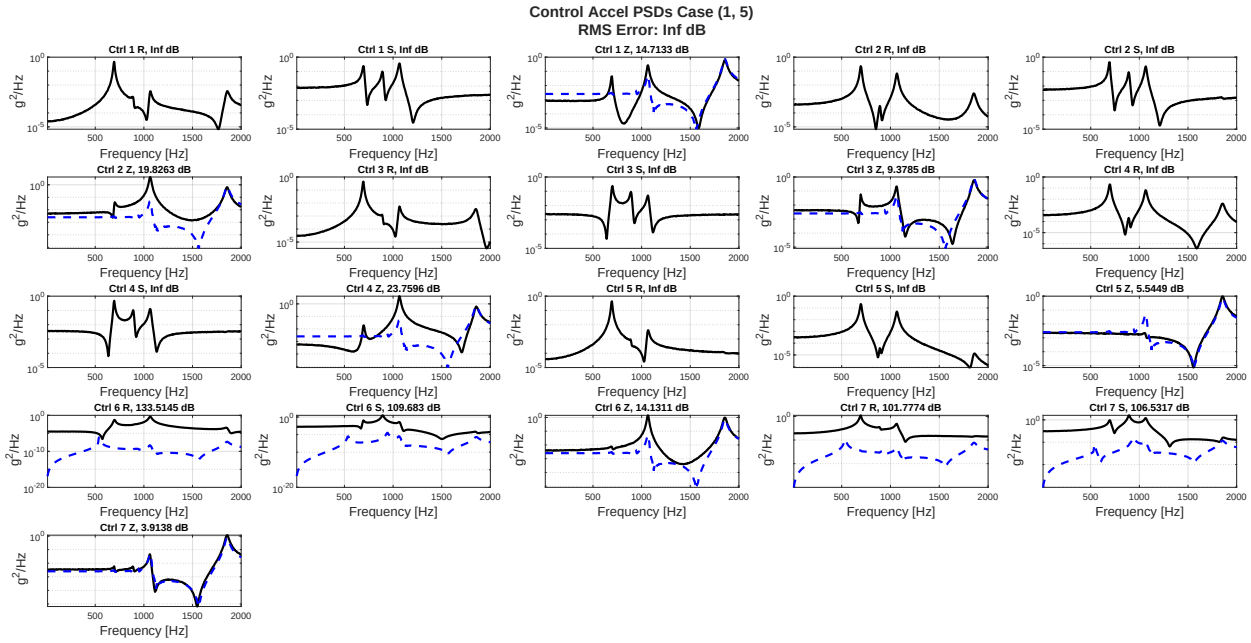


Figure 43: Control Accels, Noise, No CN, Case (1,5)

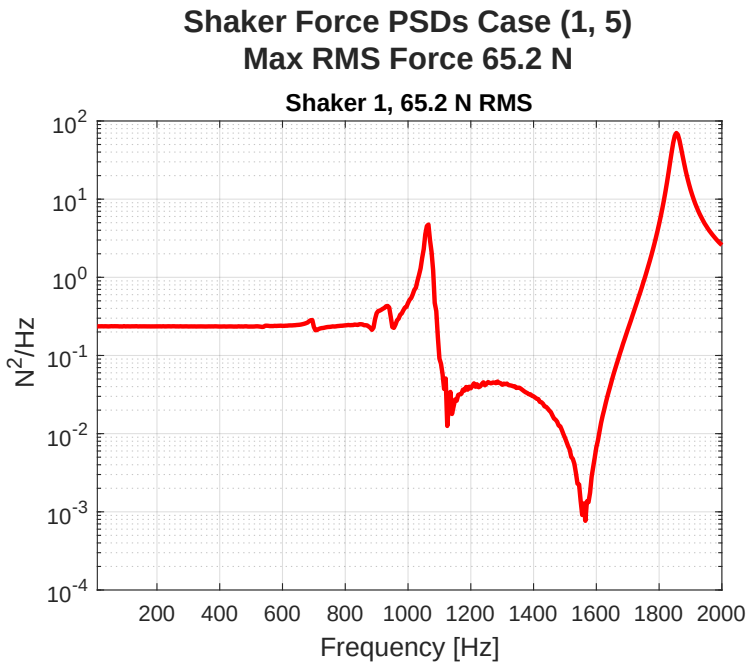


Figure 44: Shaker Forces, Noise, No CN, Case (1,5)

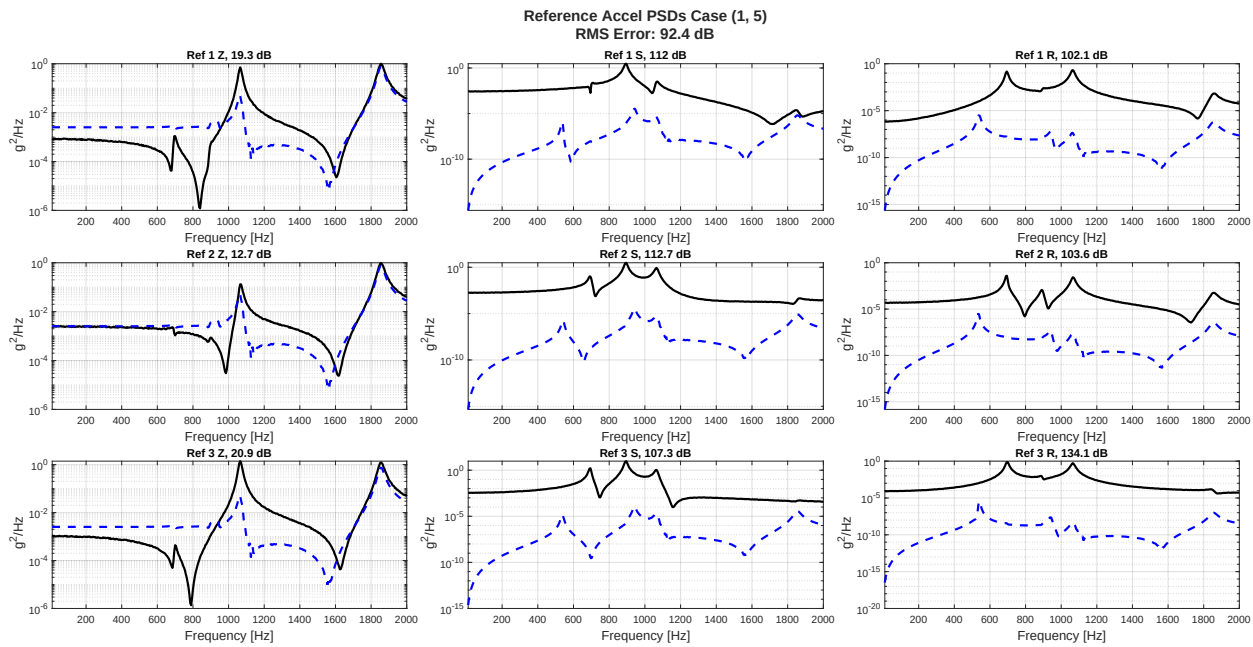


Figure 45: Reference Accels, Noise, with CN, Case (1,5)

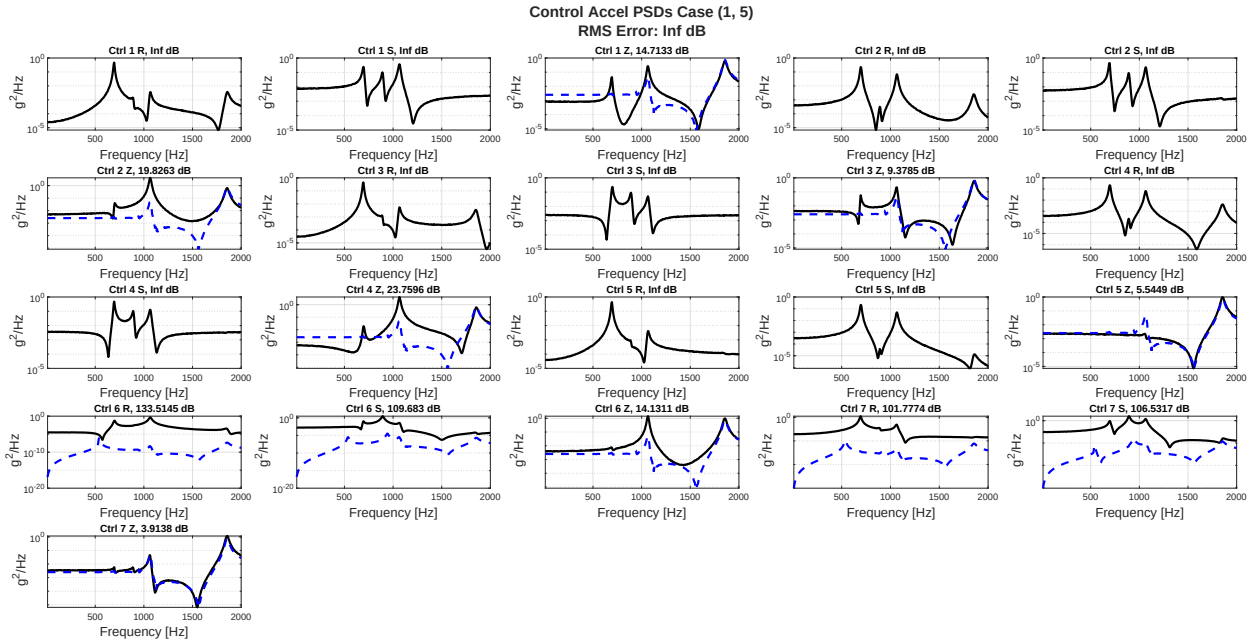


Figure 46: Control Accels, Noise, with CN, Case (1,5)

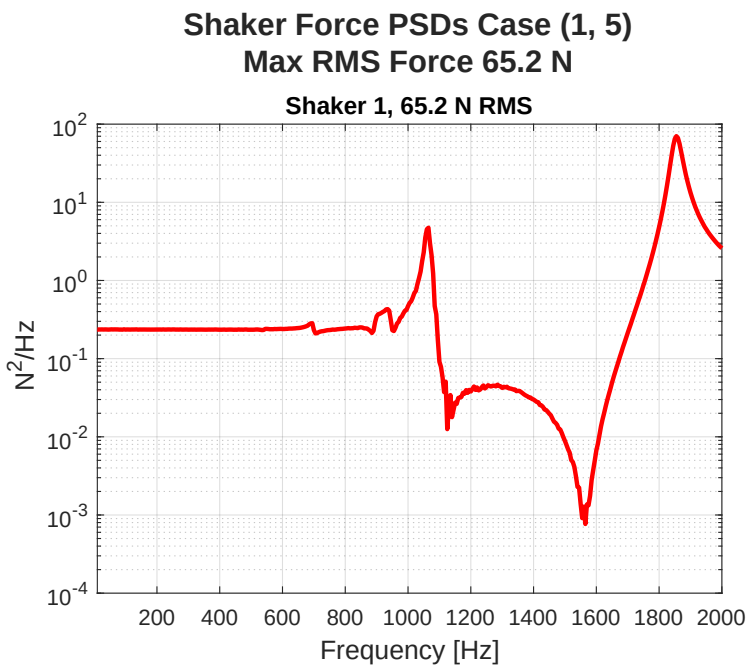


Figure 47: Shaker Forces, Noise, with CN, Case (1,5)

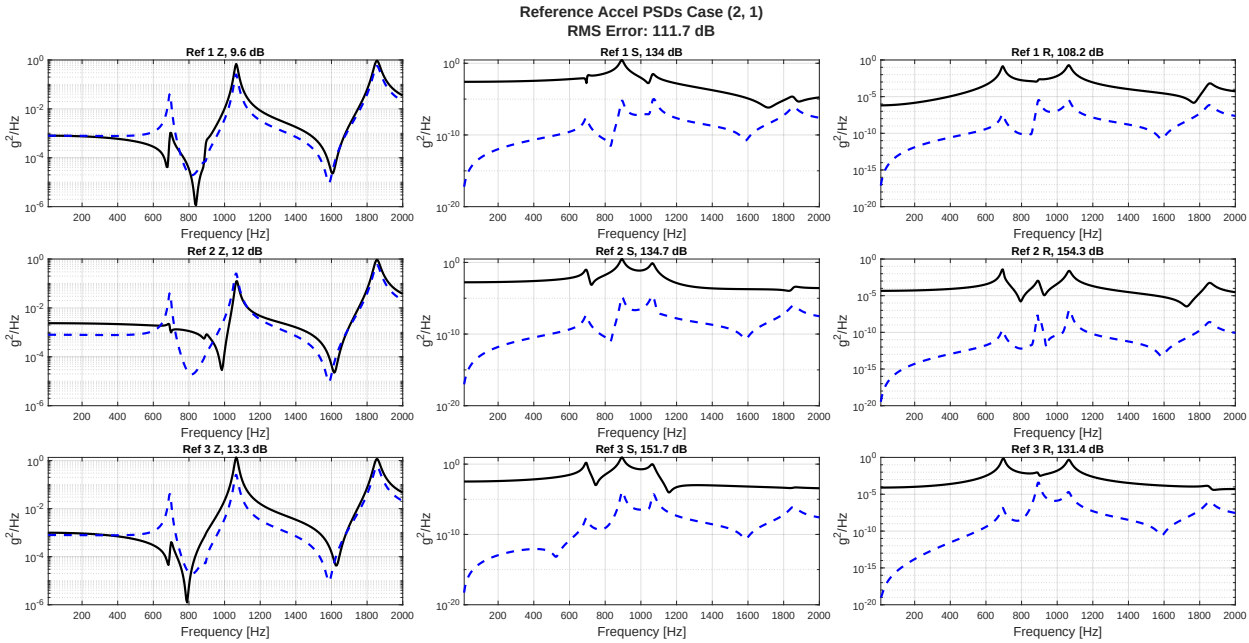


Figure 48: Reference Accels, No Noise, Case (2,1)

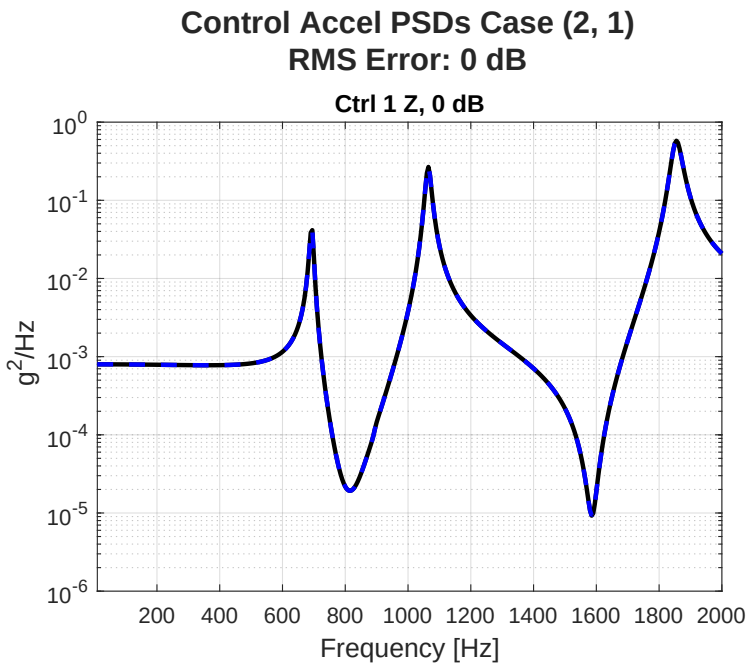


Figure 49: Control Accels, No Noise, Case (2,1)

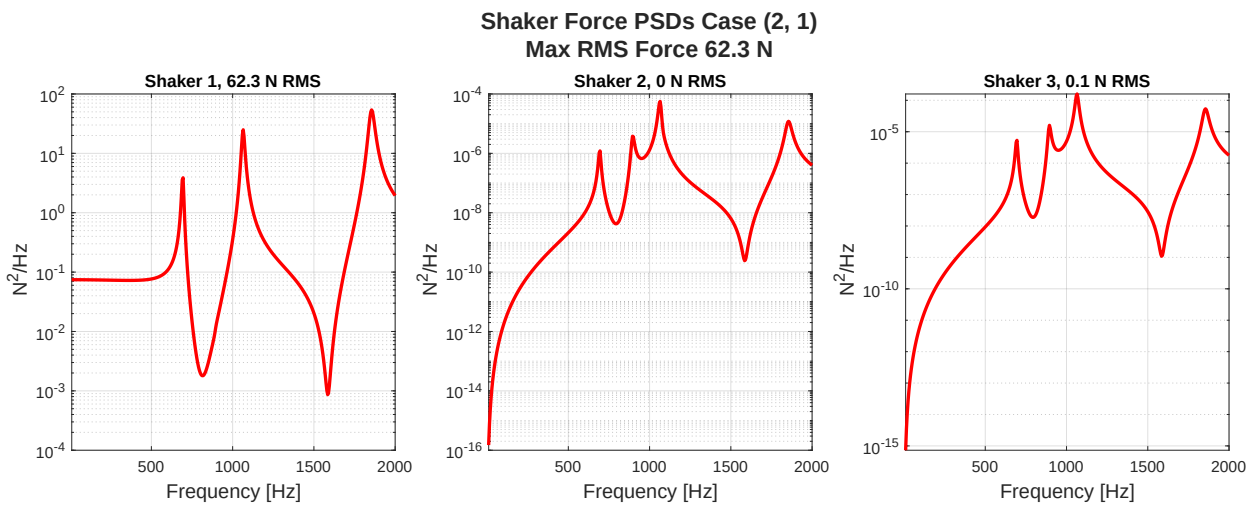


Figure 50: Shaker Forces, No Noise, Case (2,1)

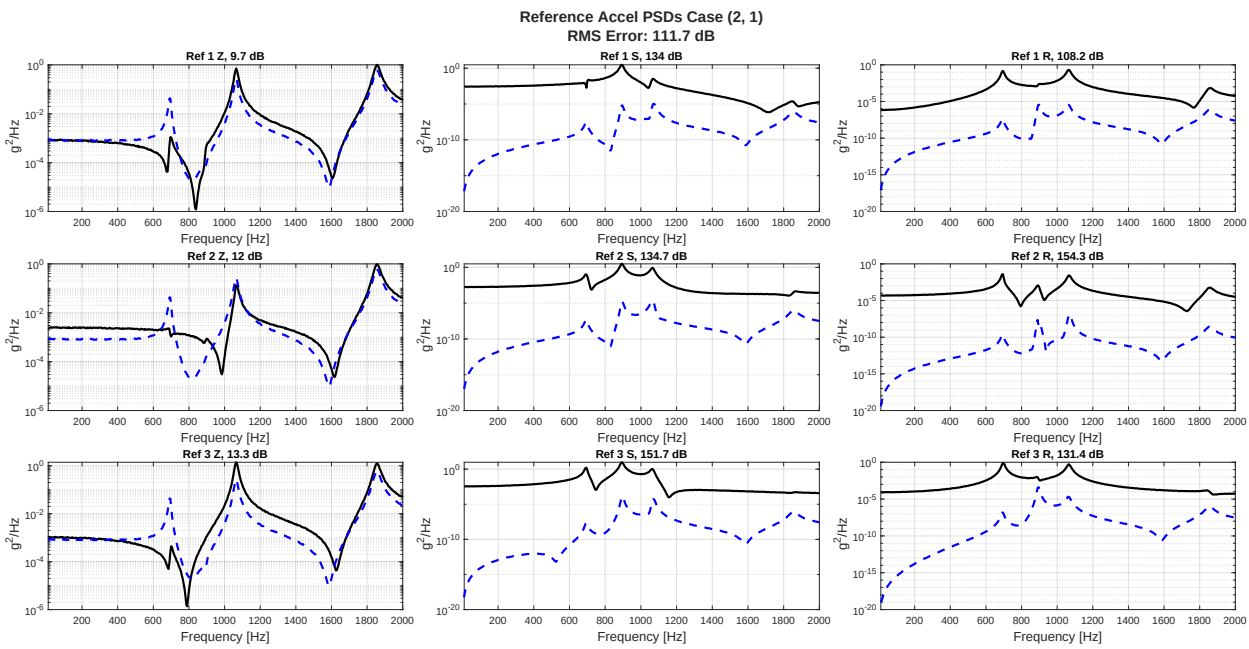


Figure 51: Reference Accels, Noise, No CN, Case (2,1)

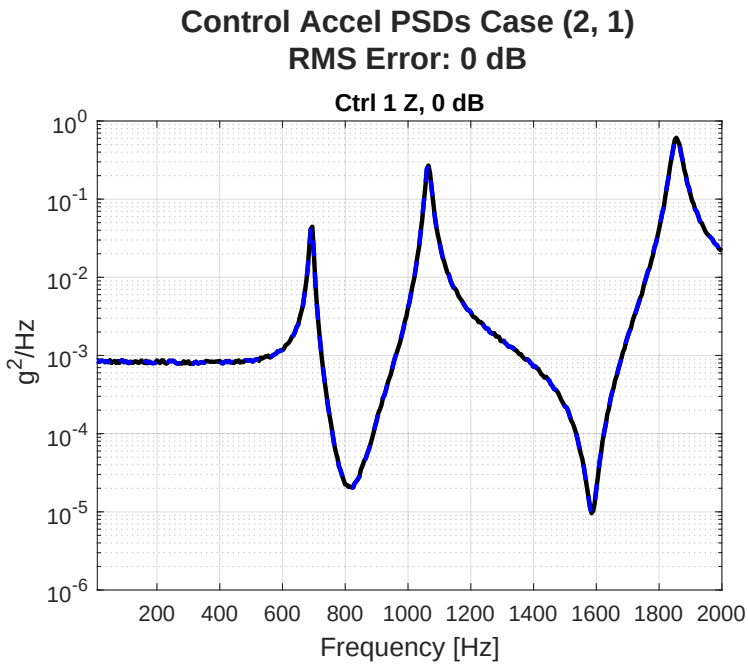


Figure 52: Control Accels, Noise, No CN, Case (2,1)

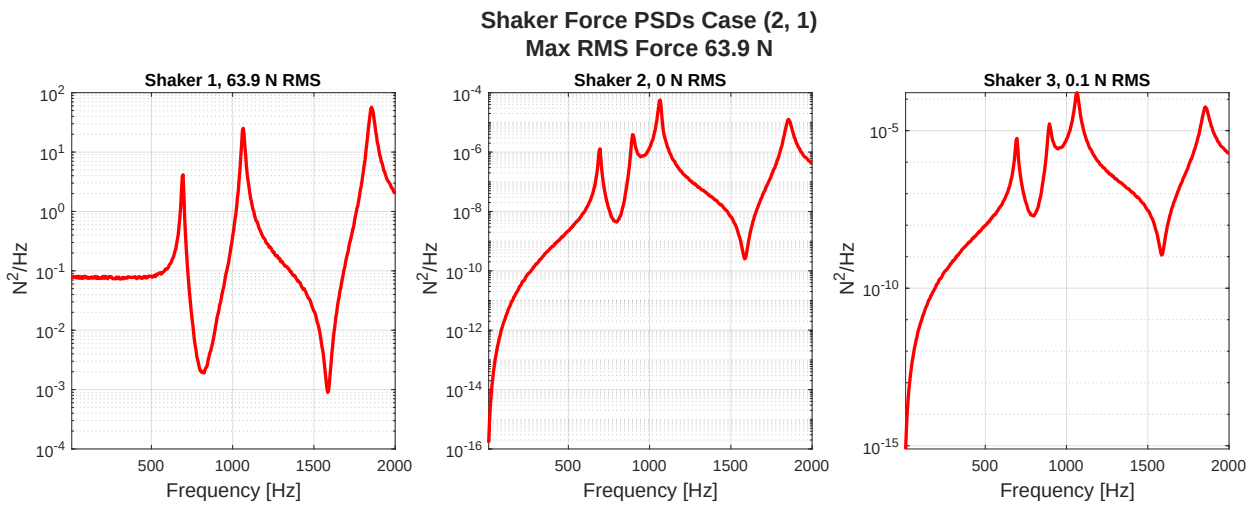


Figure 53: Shaker Forces, Noise, No CN, Case (2,1)

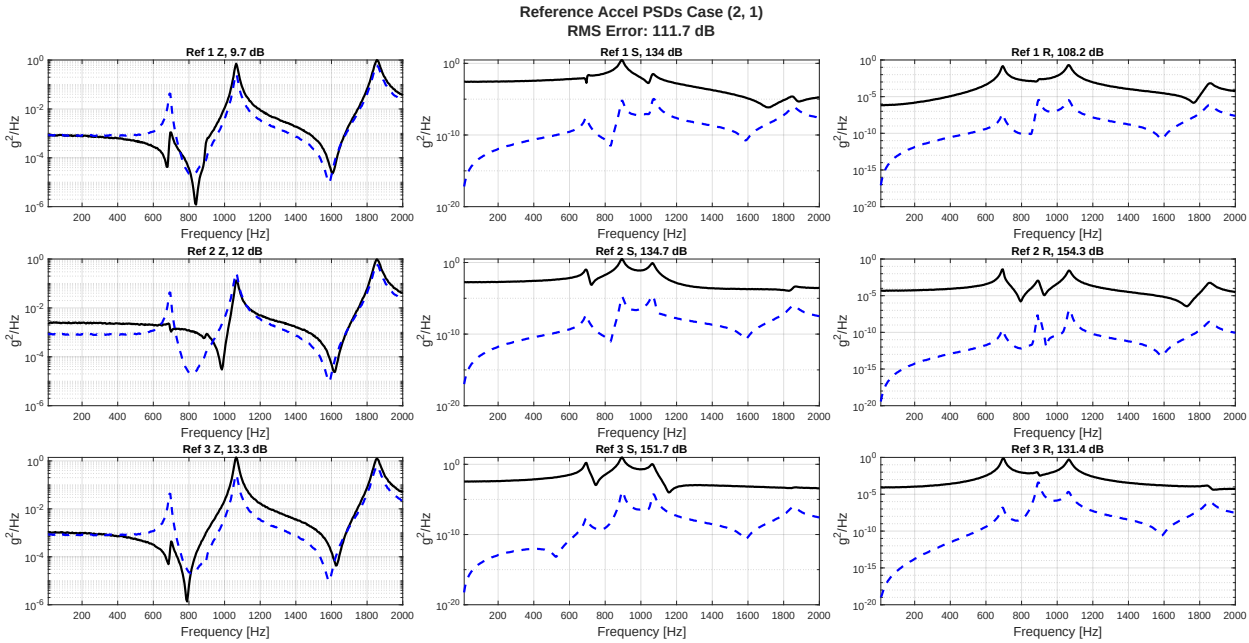


Figure 54: Reference Accels, Noise, with CN, Case (2,1)

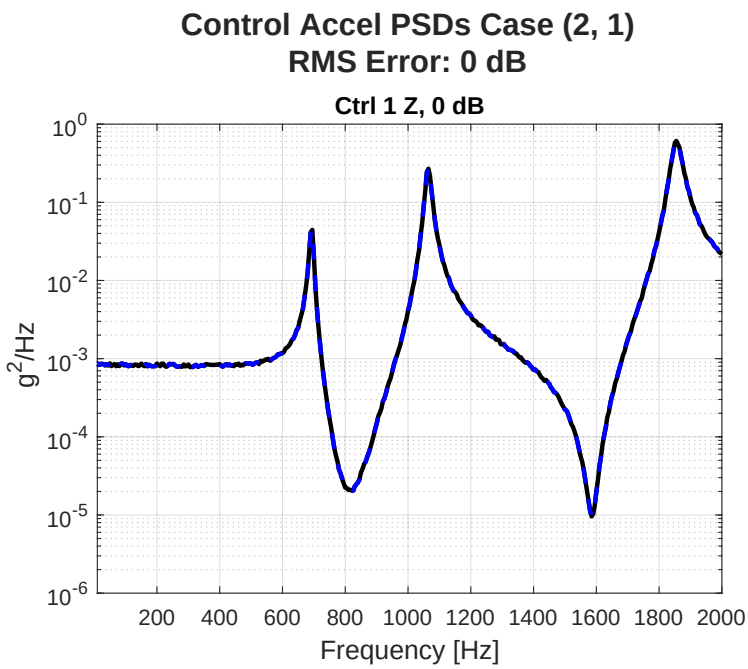


Figure 55: Control Accels, Noise, with CN, Case (2,1)

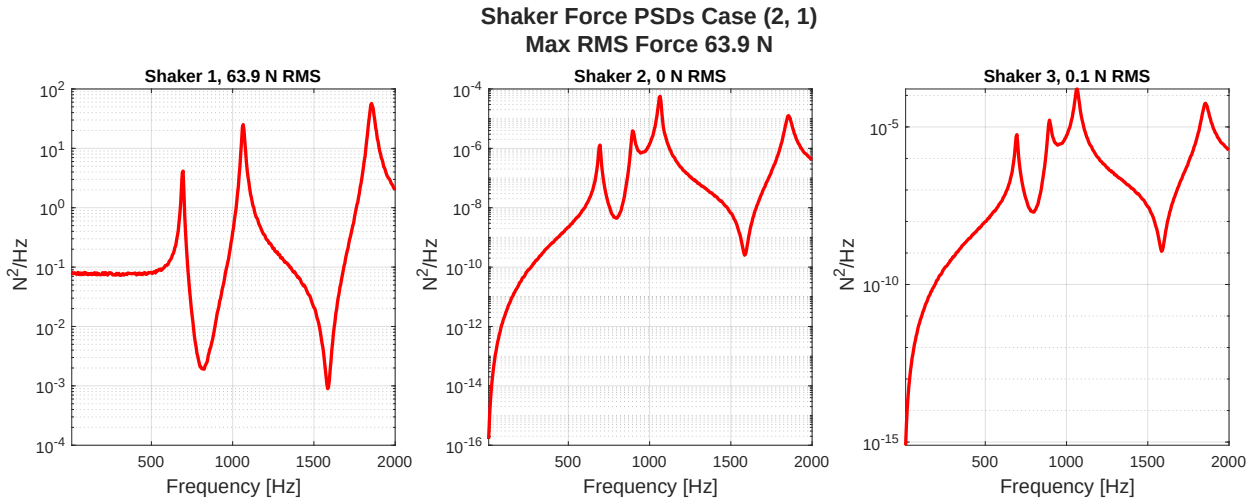


Figure 56: Shaker Forces, Noise, with CN, Case (2,1)

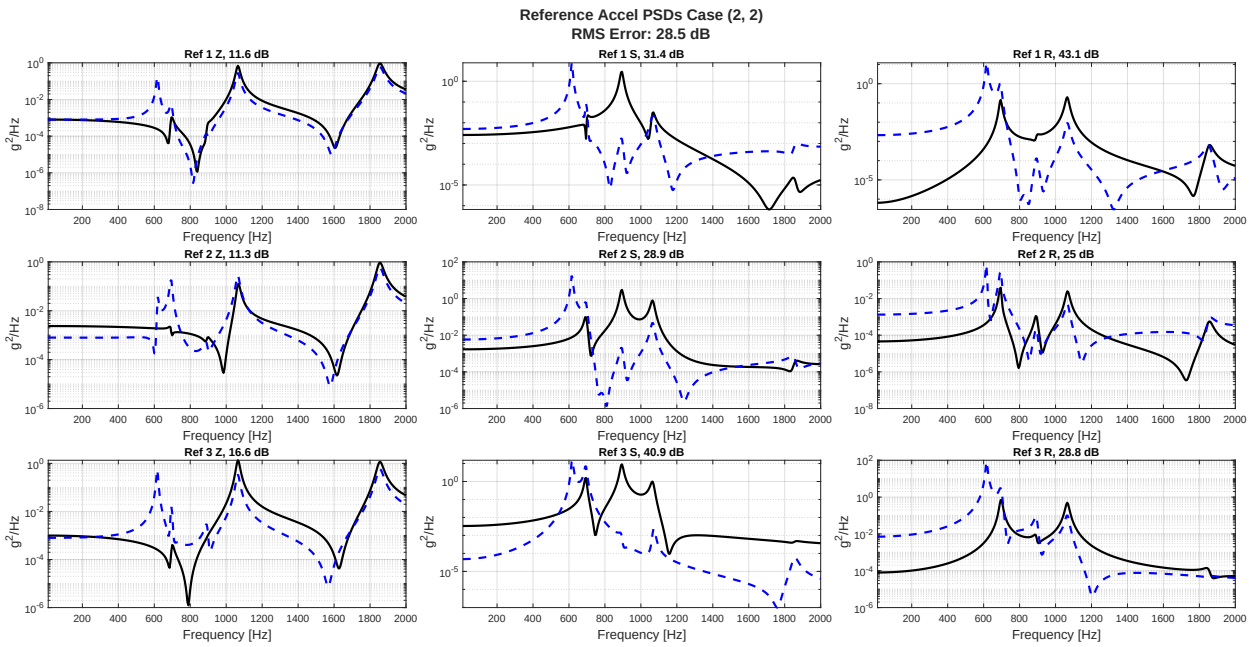


Figure 57: Reference Accels, No Noise, Case (2,2)

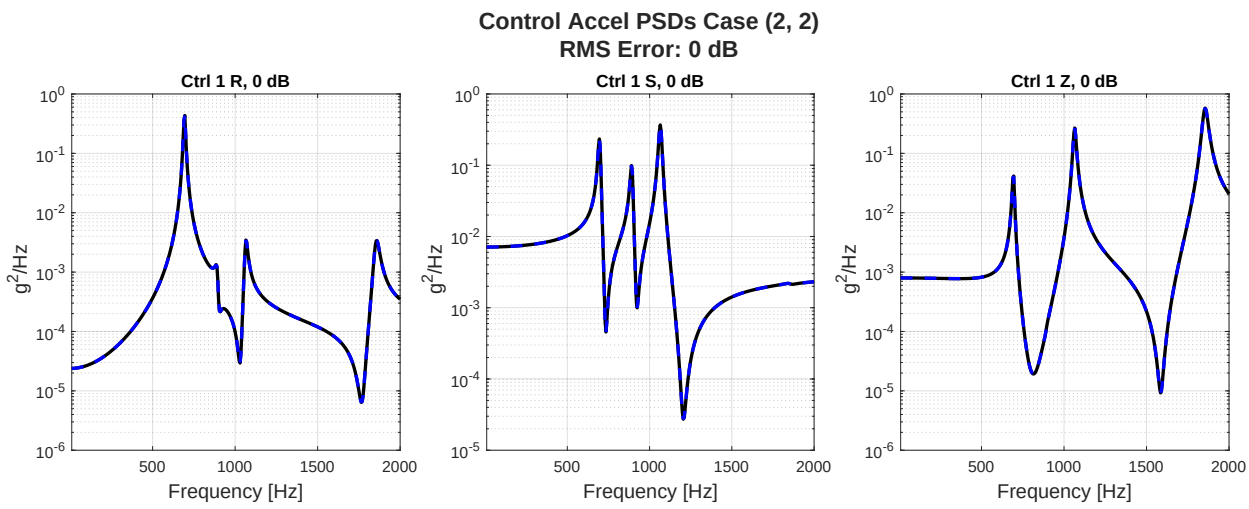


Figure 58: Control Accels, No Noise, Case (2,2)

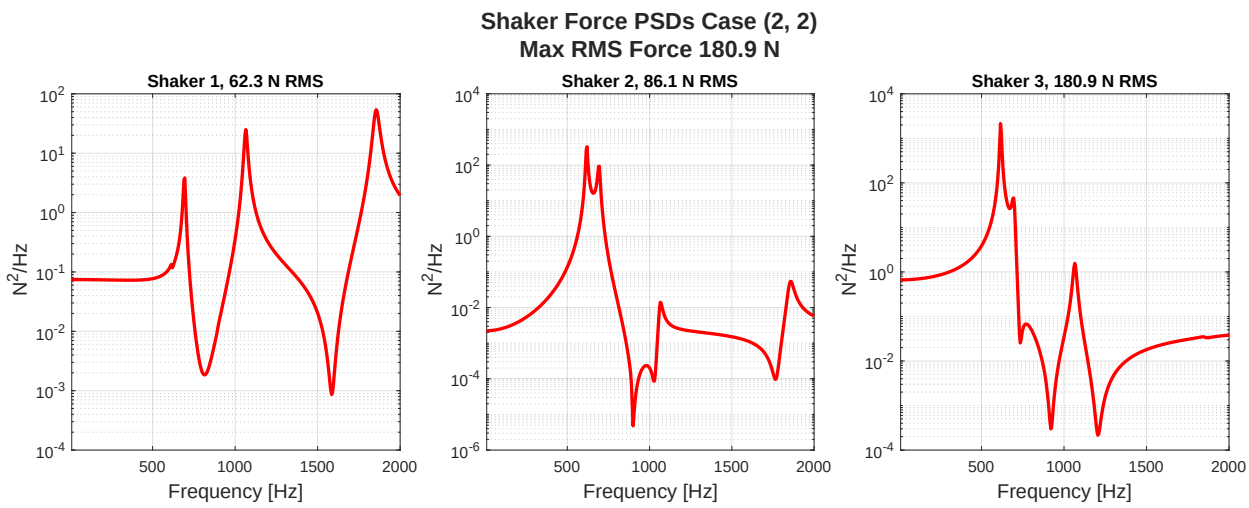


Figure 59: Shaker Forces, No Noise, Case (2,2)

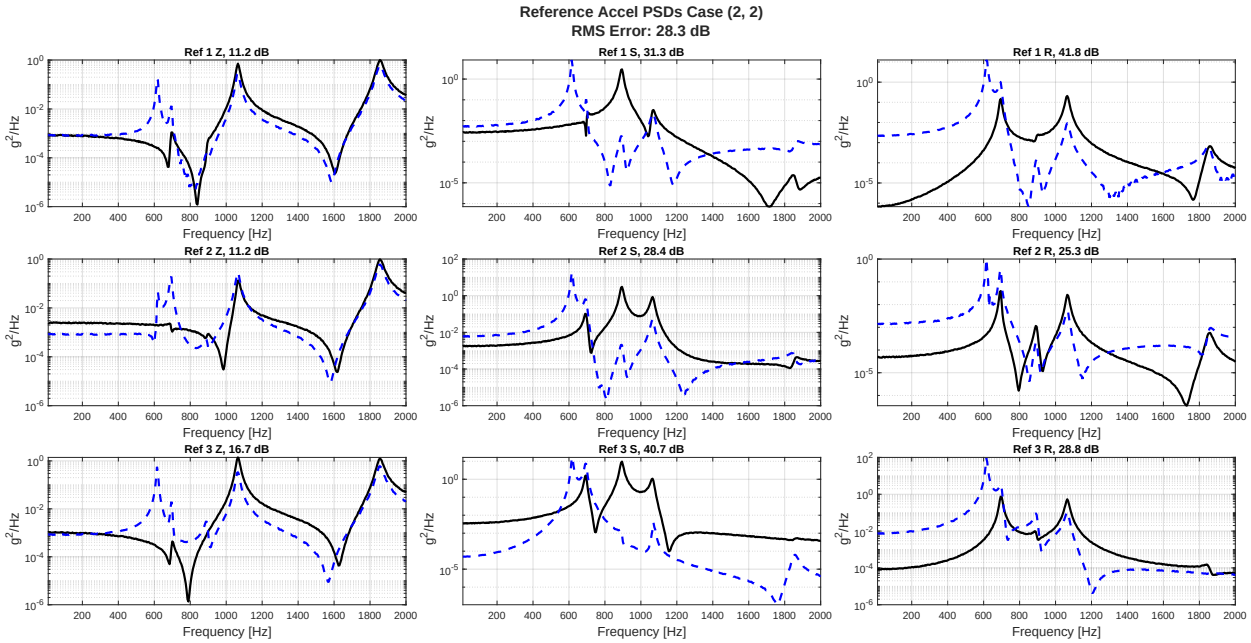


Figure 60: Reference Accels, Noise, No CN, Case (2,2)

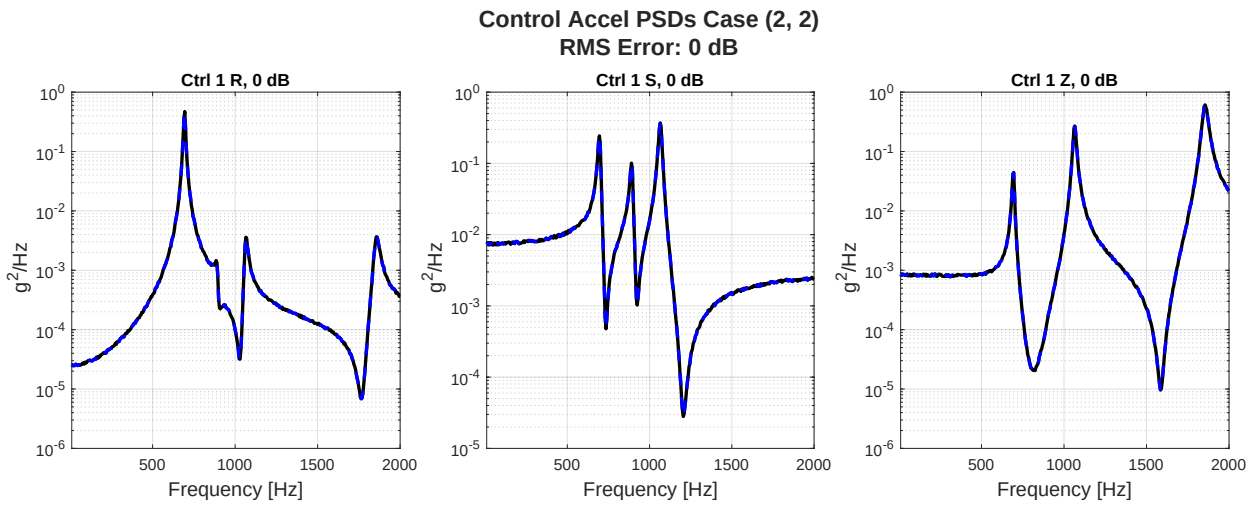


Figure 61: Control Accels, Noise, No CN, Case (2,2)

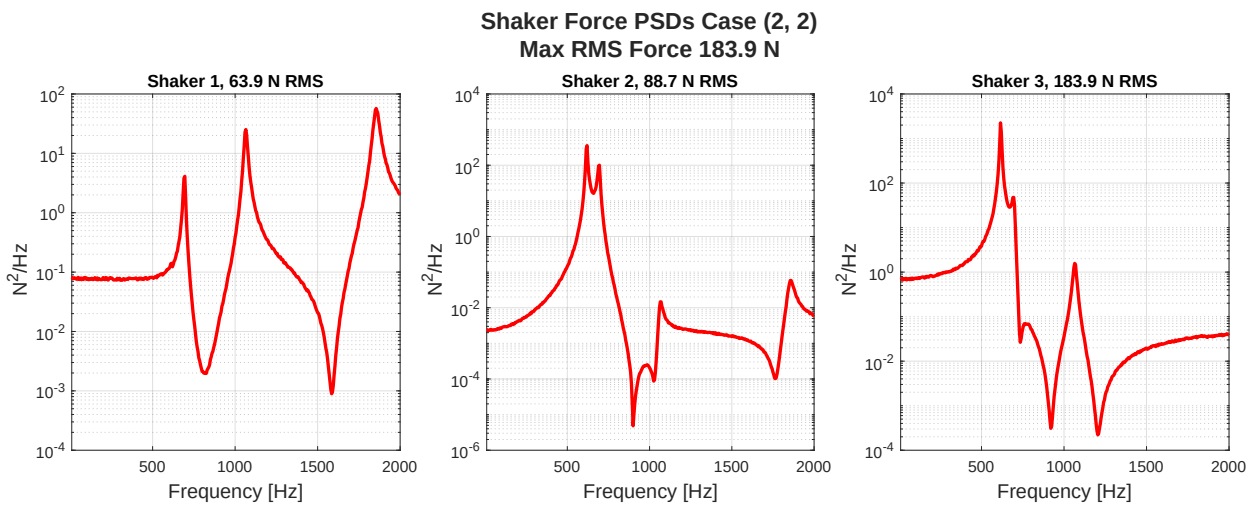


Figure 62: Shaker Forces, Noise, No CN, Case (2,2)

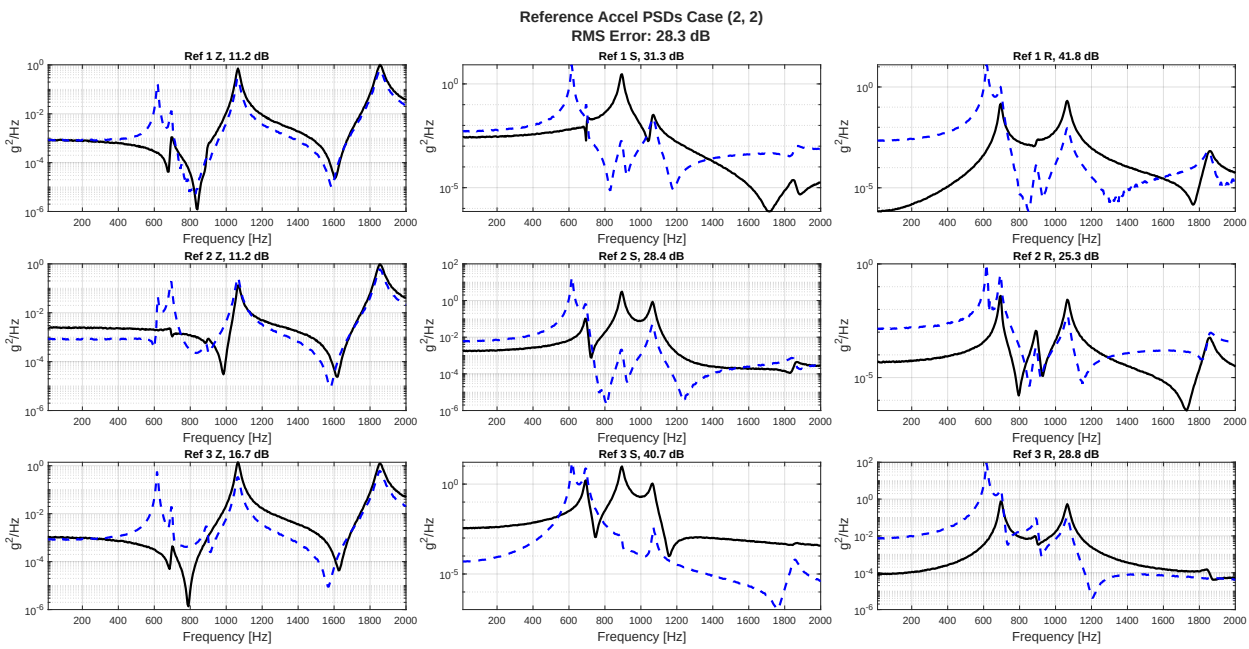


Figure 63: Reference Accels, Noise, with CN, Case (2,2)

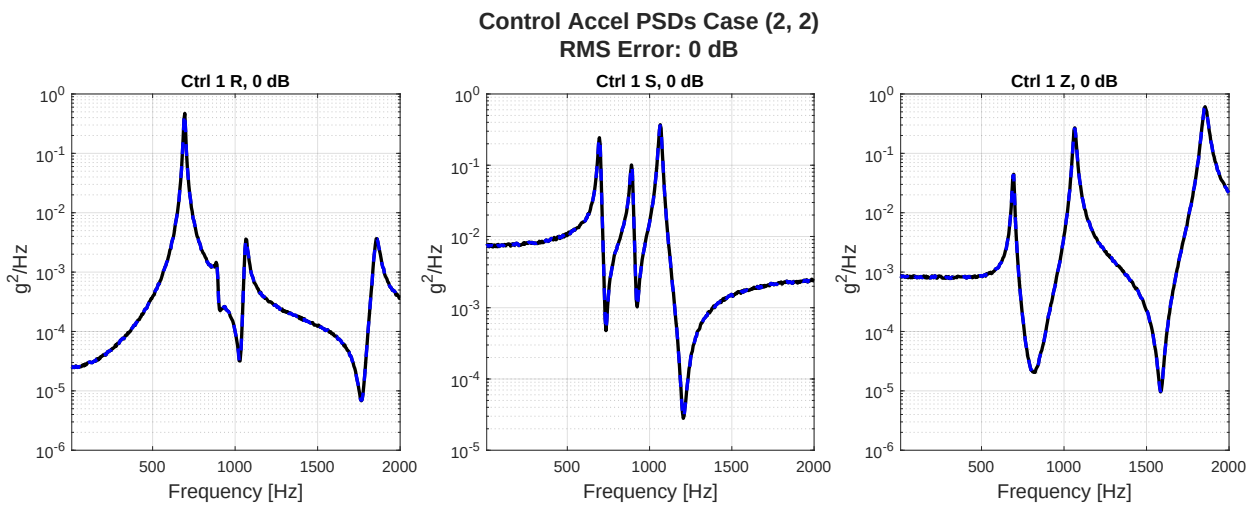


Figure 64: Control Accels, Noise, with CN, Case (2,2)

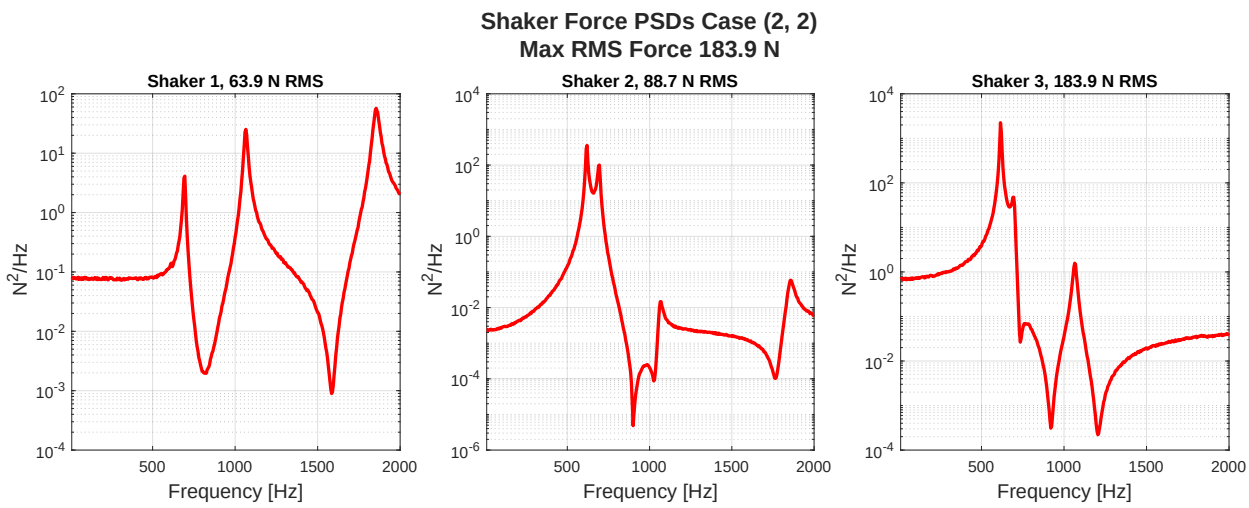


Figure 65: Shaker Forces, Noise, with CN, Case (2,2)

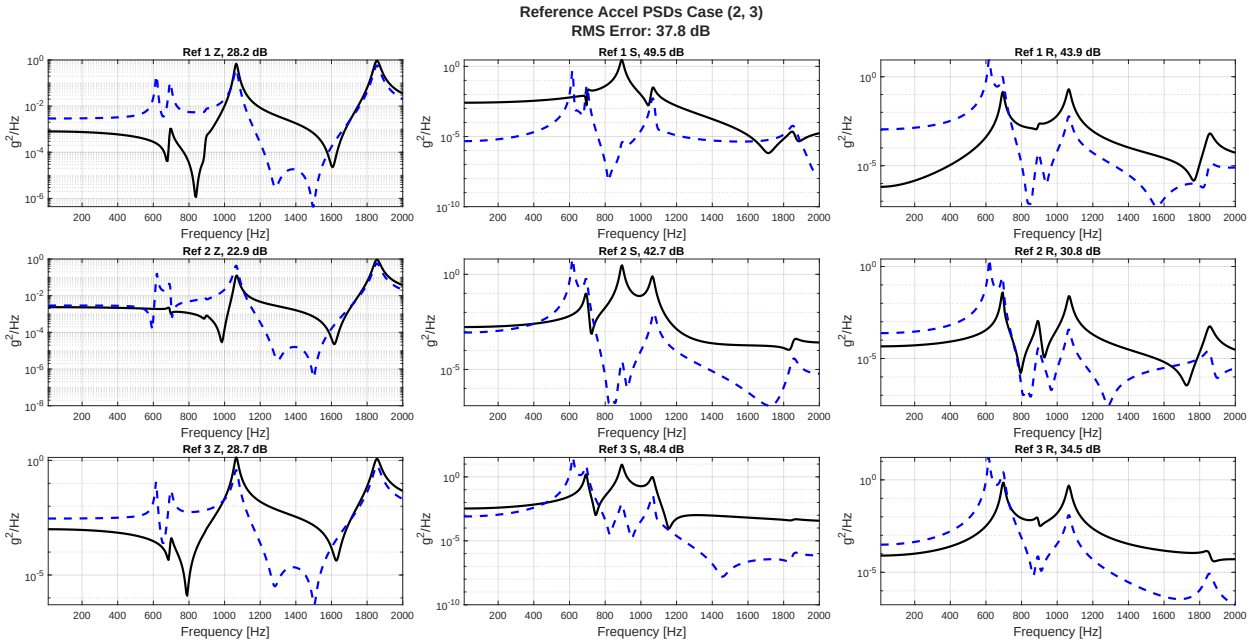


Figure 66: Reference Accels, No Noise, Case (2,3)

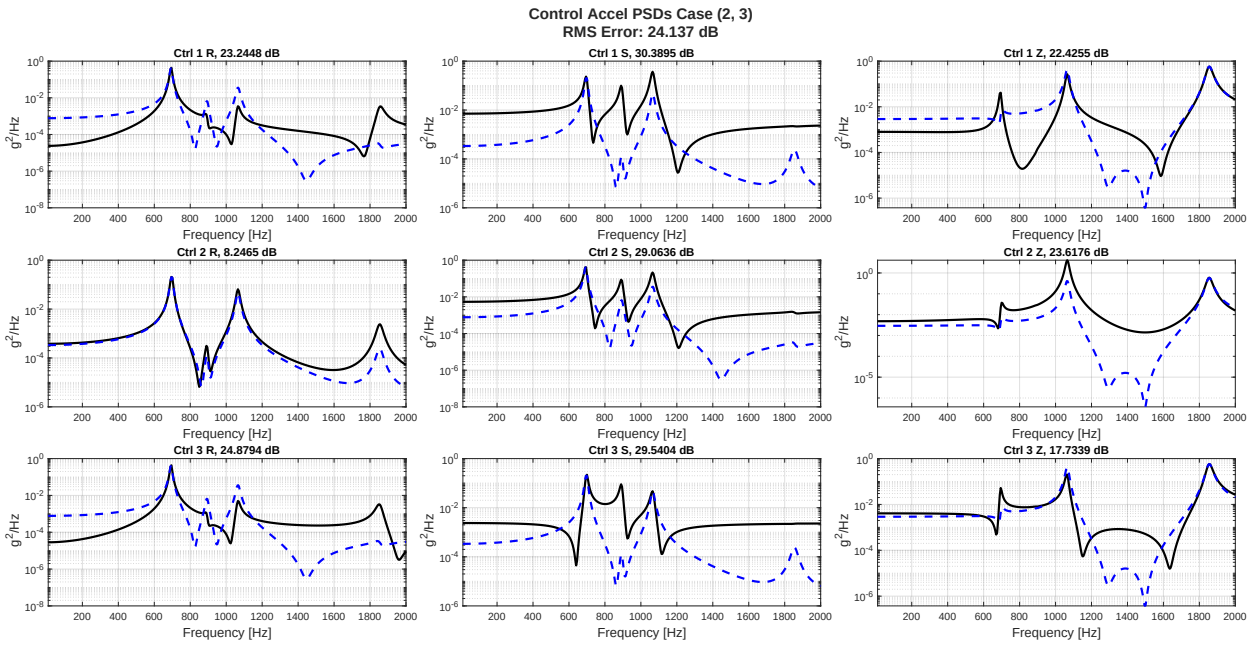


Figure 67: Control Accels, No Noise, Case (2,3)

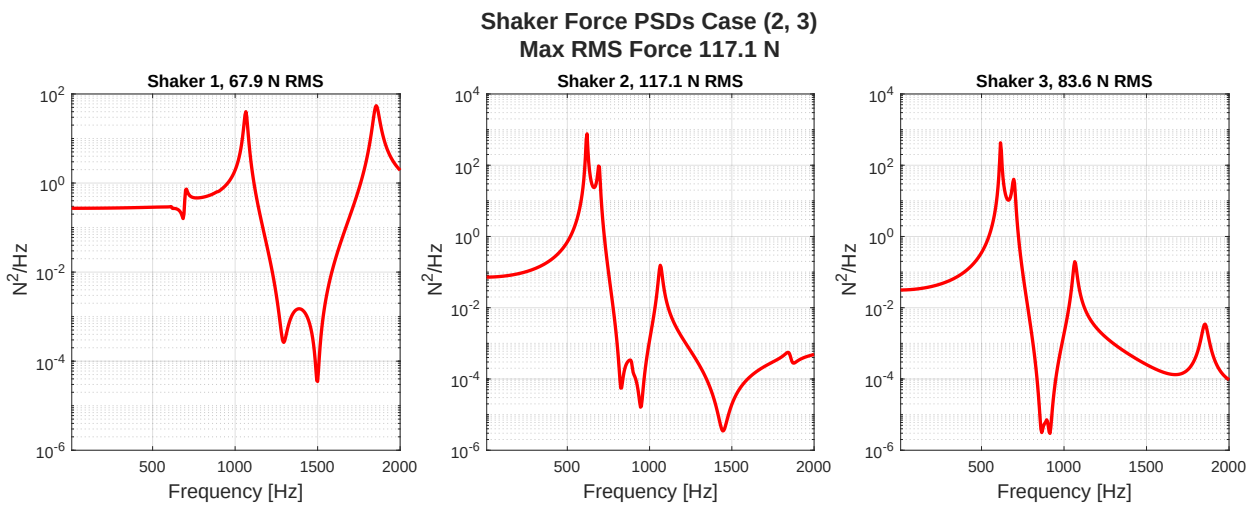


Figure 68: Shaker Forces, No Noise, Case (2,3)

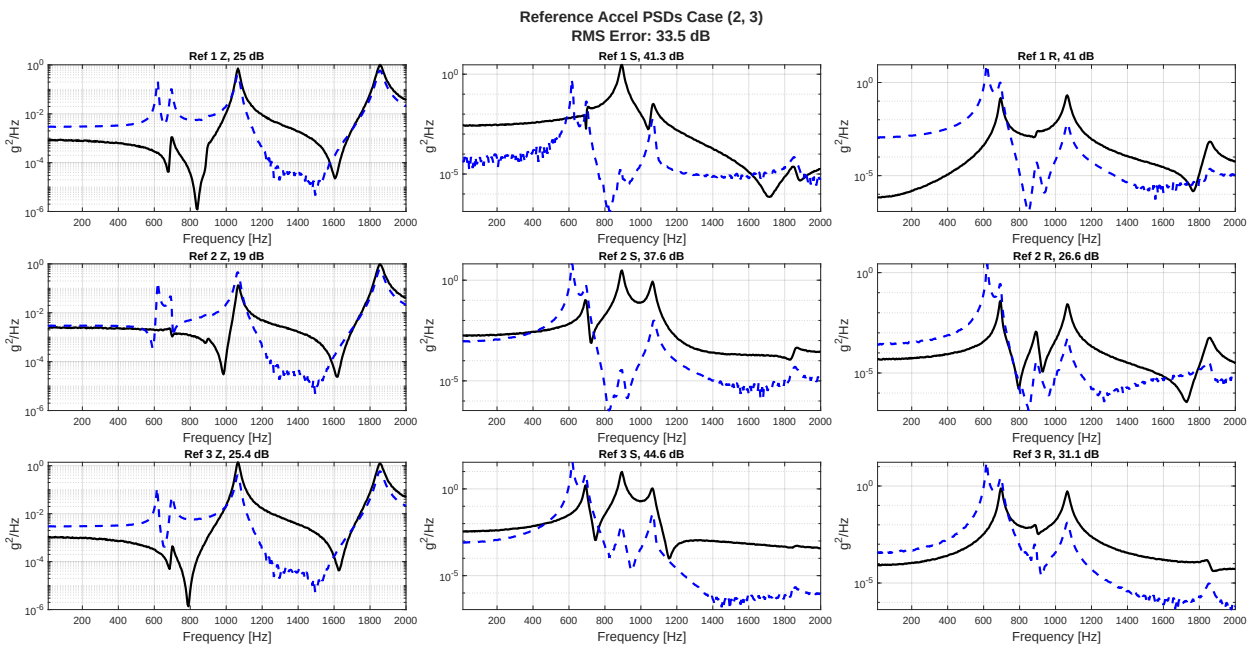


Figure 69: Reference Accels, Noise, No CN, Case (2,3)

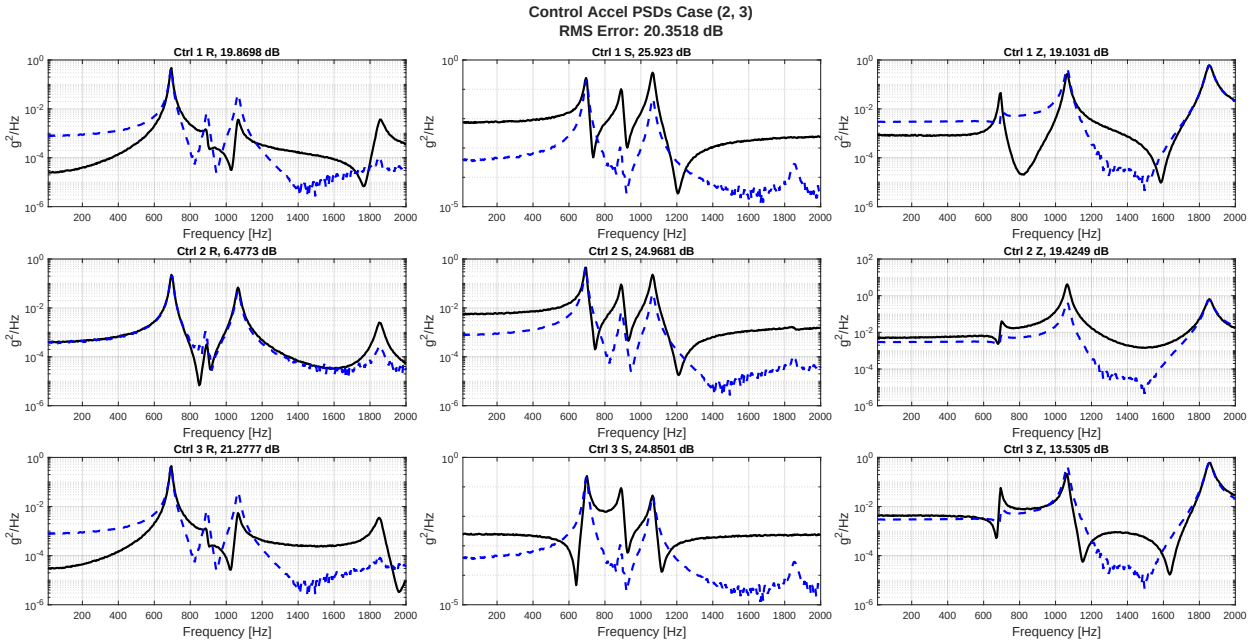


Figure 70: Control Accels, Noise, No CN, Case (2,3)

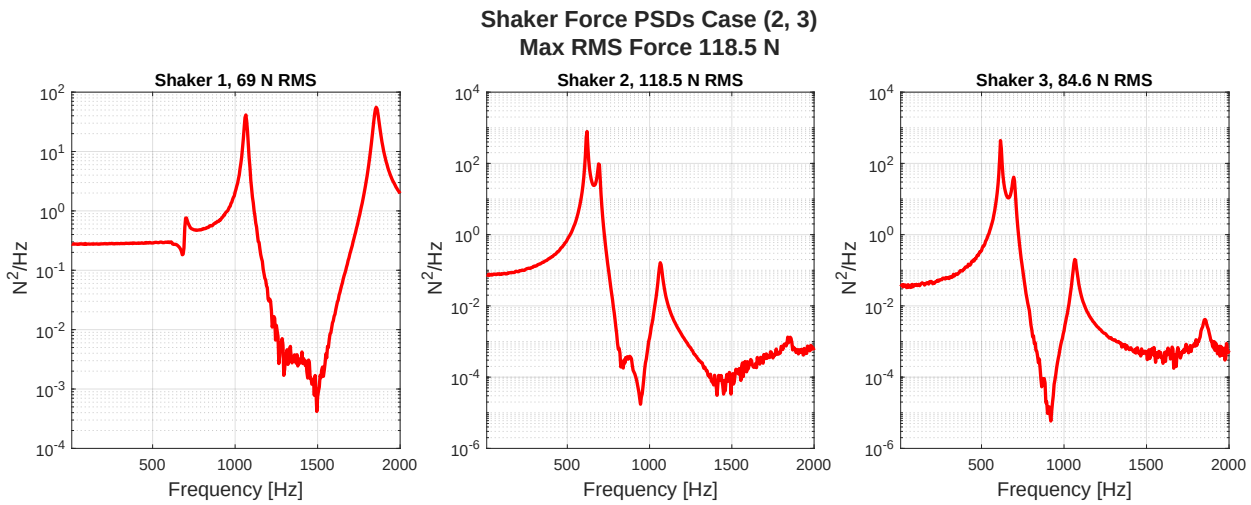


Figure 71: Shaker Forces, Noise, No CN, Case (2,3)

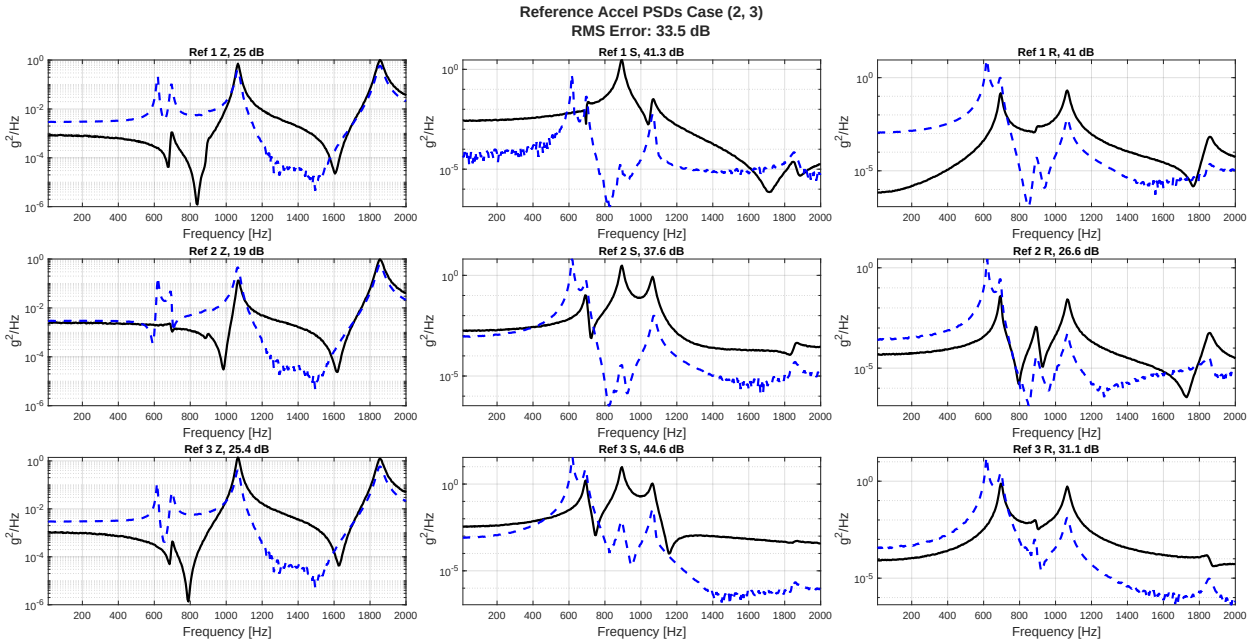


Figure 72: Reference Accels, Noise, with CN, Case (2,3)

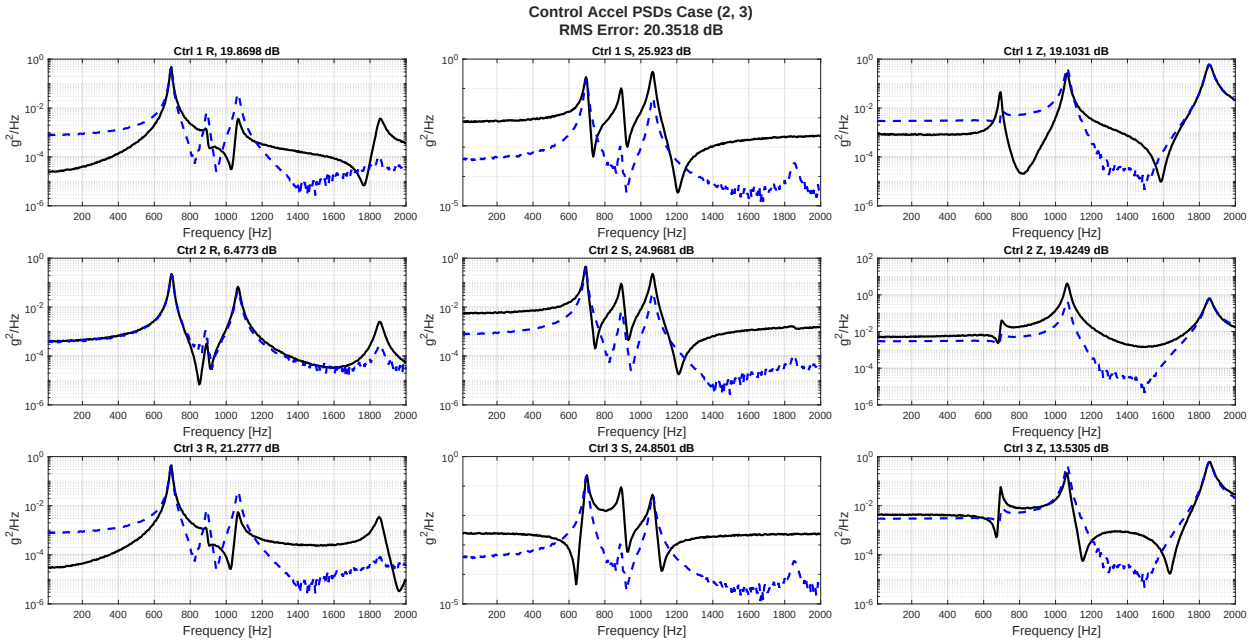


Figure 73: Control Accels, Noise, with CN, Case (2,3)

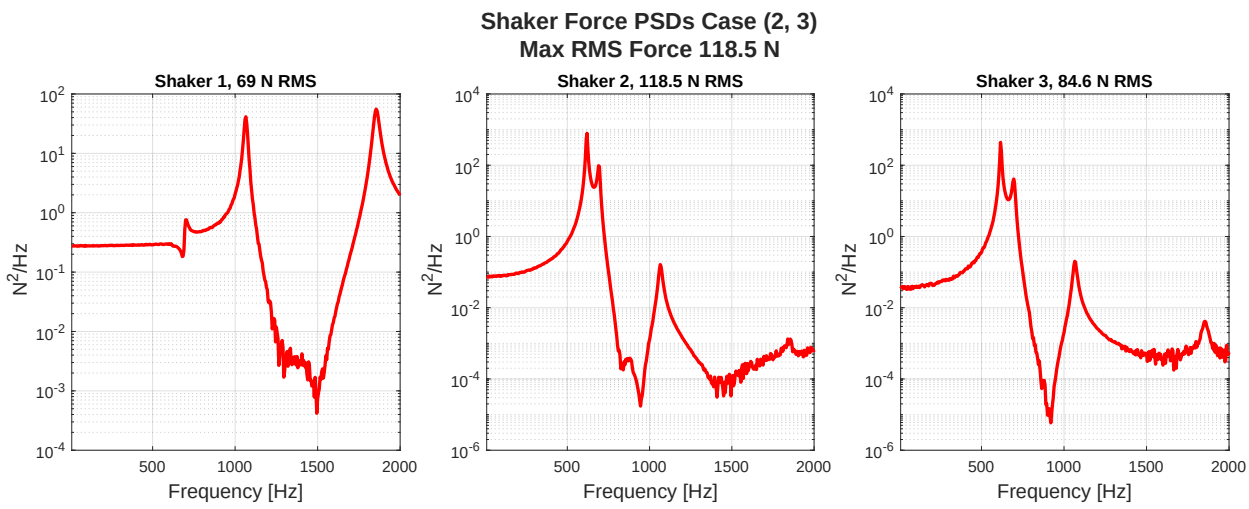


Figure 74: Shaker Forces, Noise, with CN, Case (2,3)

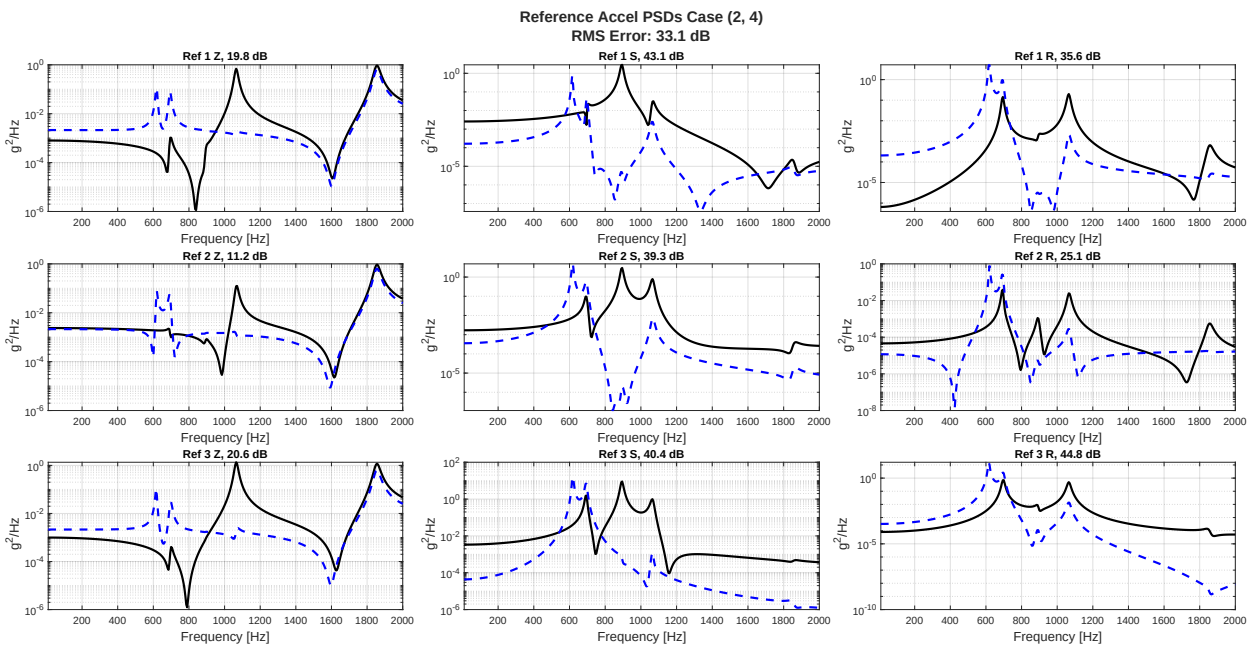


Figure 75: Reference Accels, No Noise, Case (2,4)

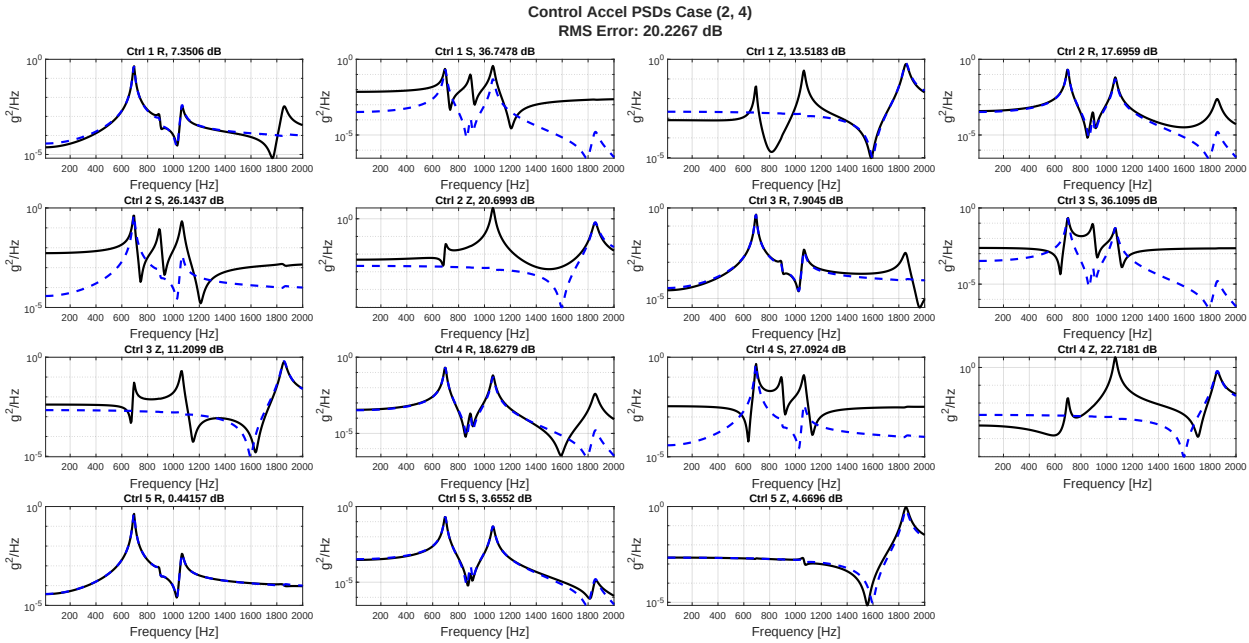


Figure 76: Control Accels, No Noise, Case (2,4)

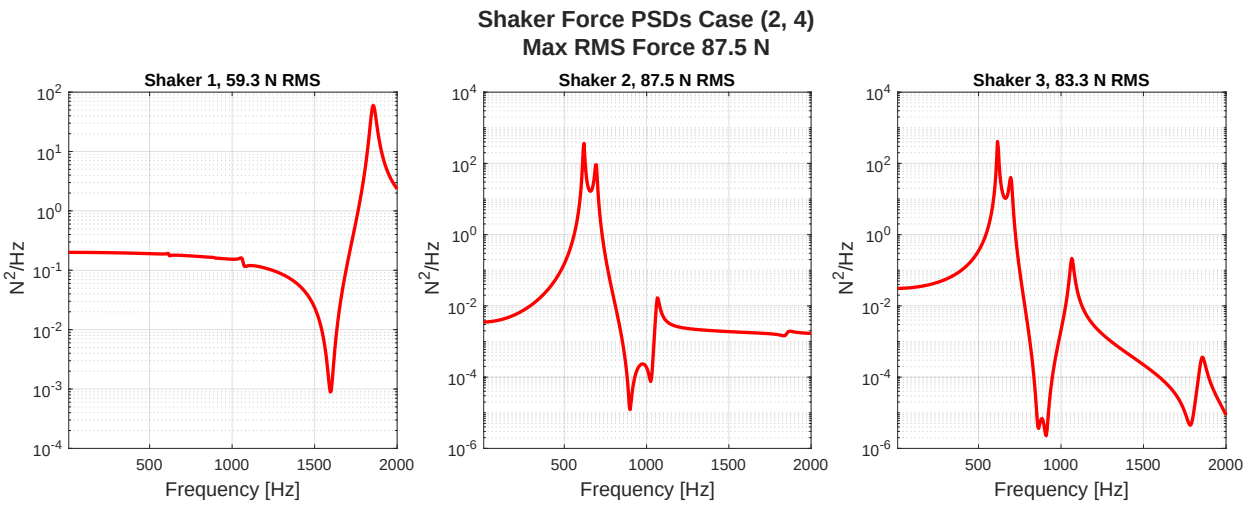


Figure 77: Shaker Forces, No Noise, Case (2,4)

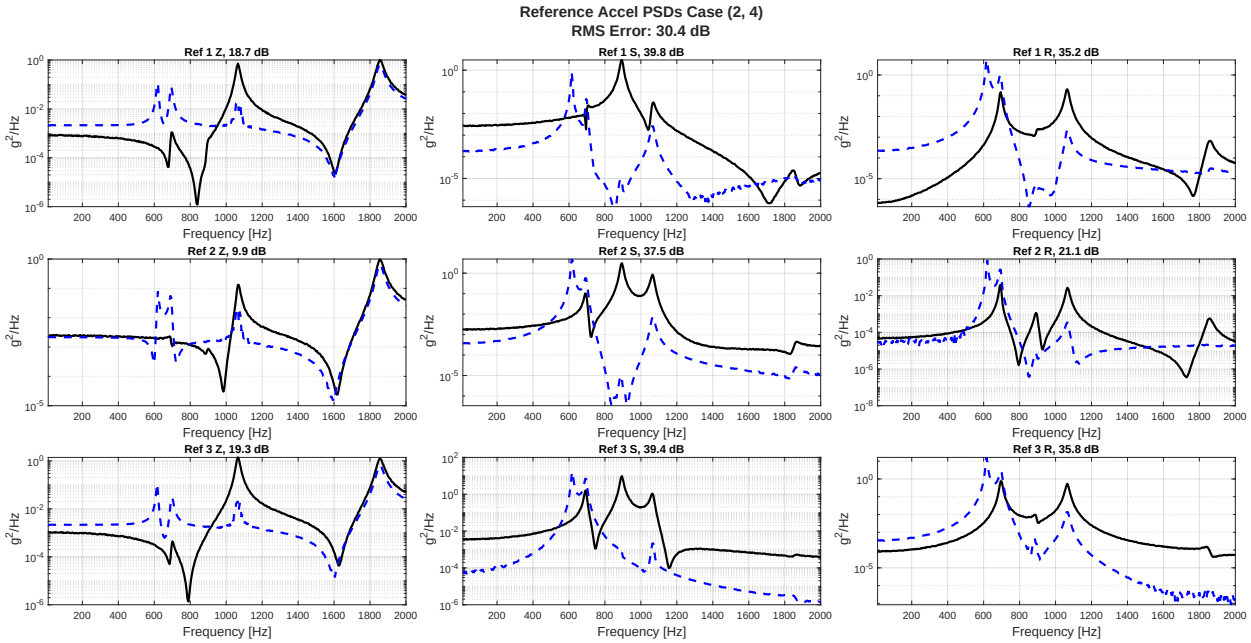


Figure 78: Reference Accels, Noise, No CN, Case (2,4)

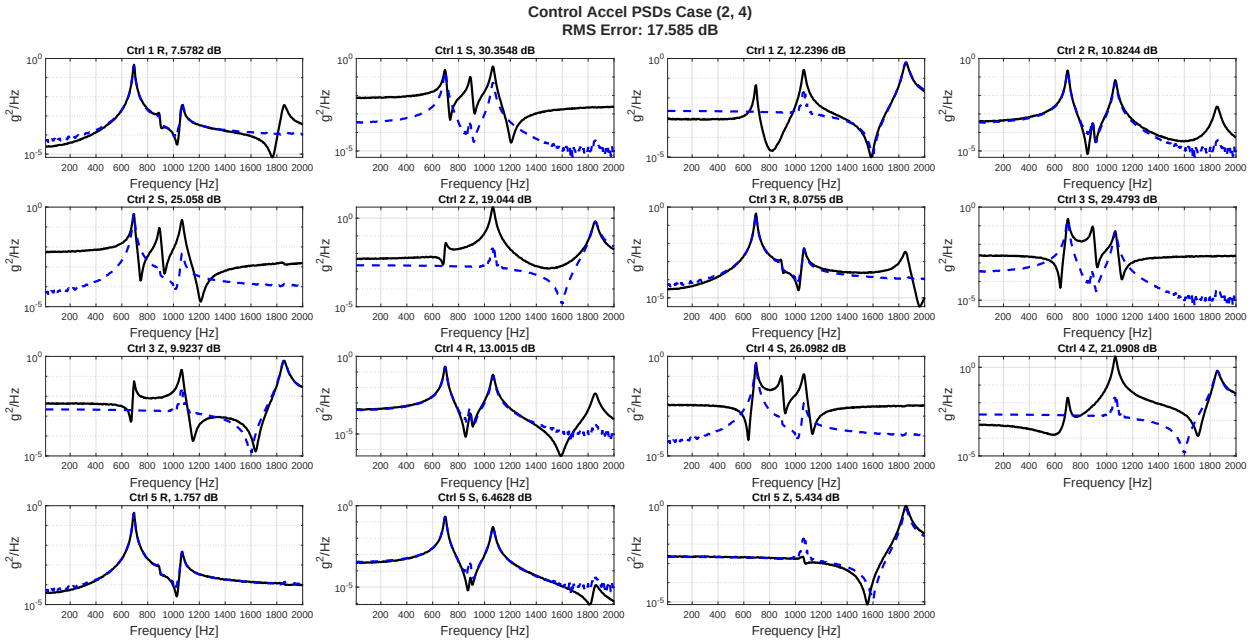


Figure 79: Control Accels, Noise, No CN, Case (2,4)

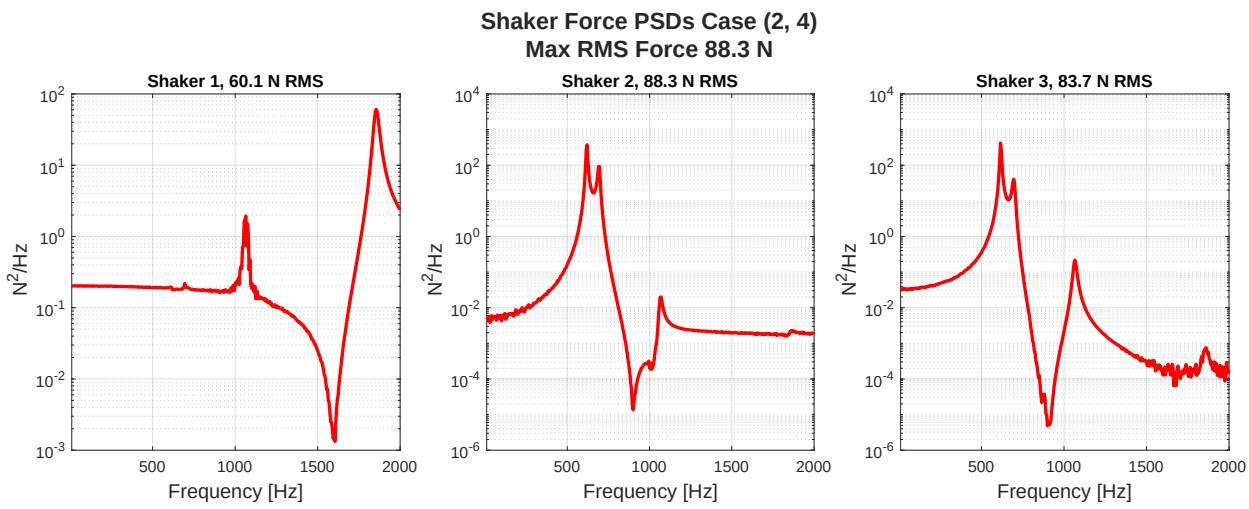


Figure 80: Shaker Forces, Noise, No CN, Case (2,4)

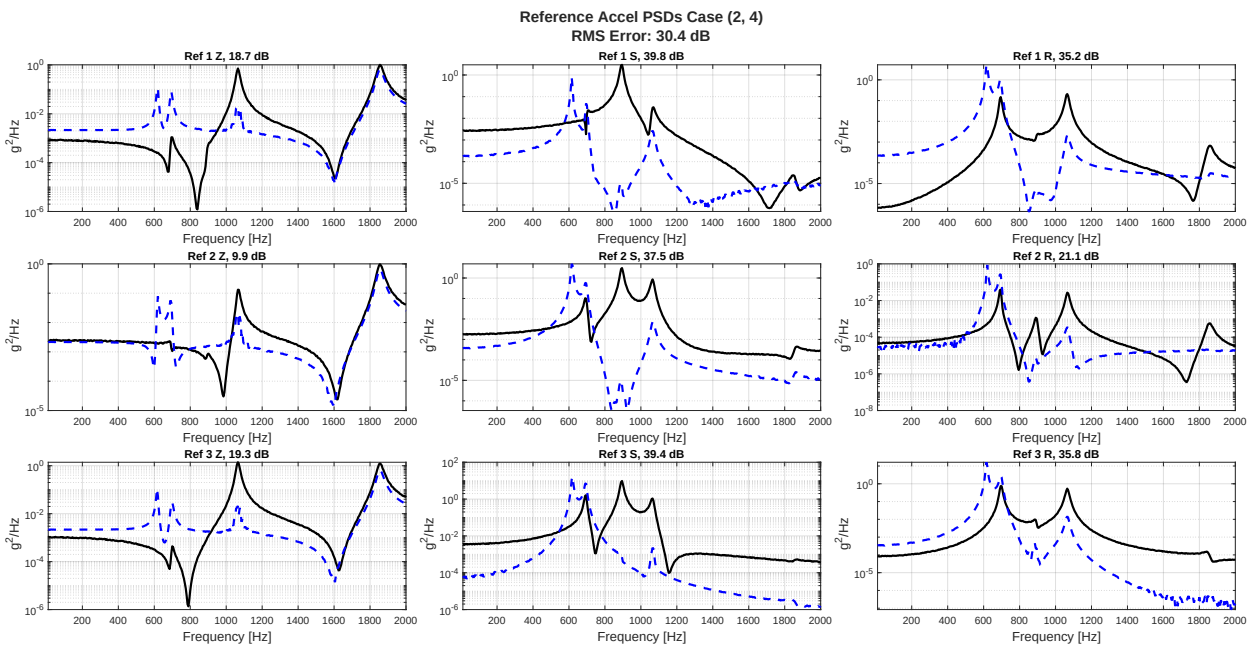


Figure 81: Reference Accels, Noise, with CN, Case (2,4)

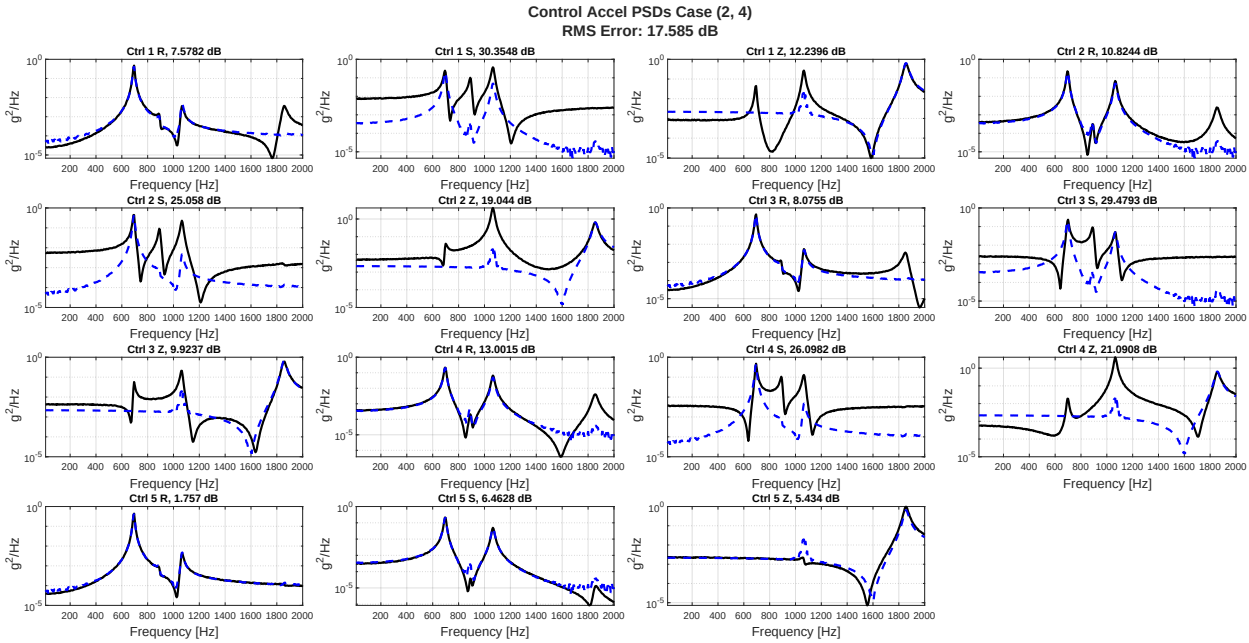


Figure 82: Control Accels, Noise, with CN, Case (2,4)

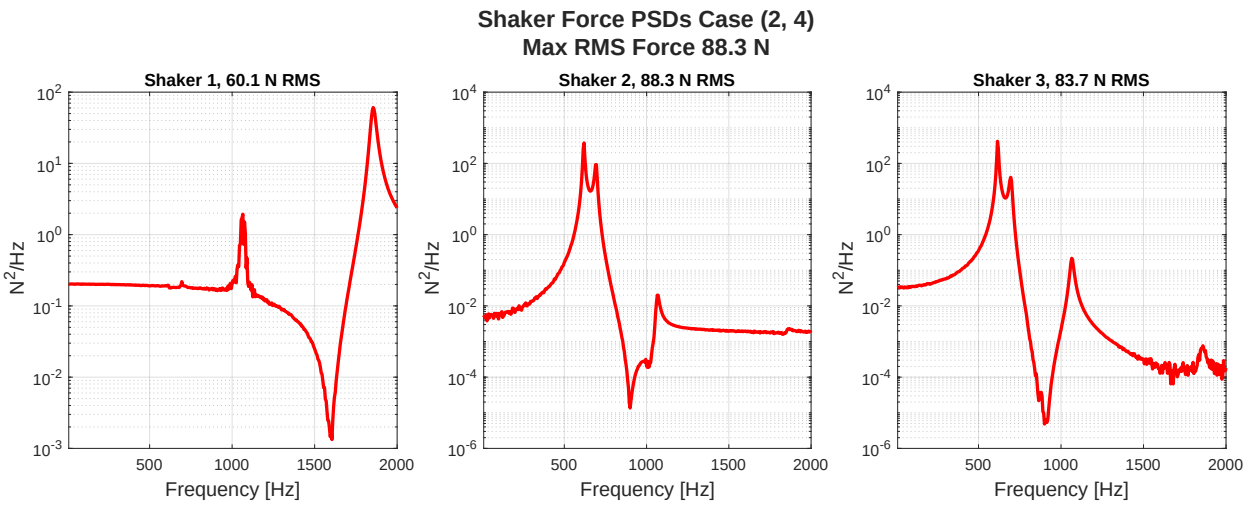


Figure 83: Shaker Forces, Noise, with CN, Case (2,4)

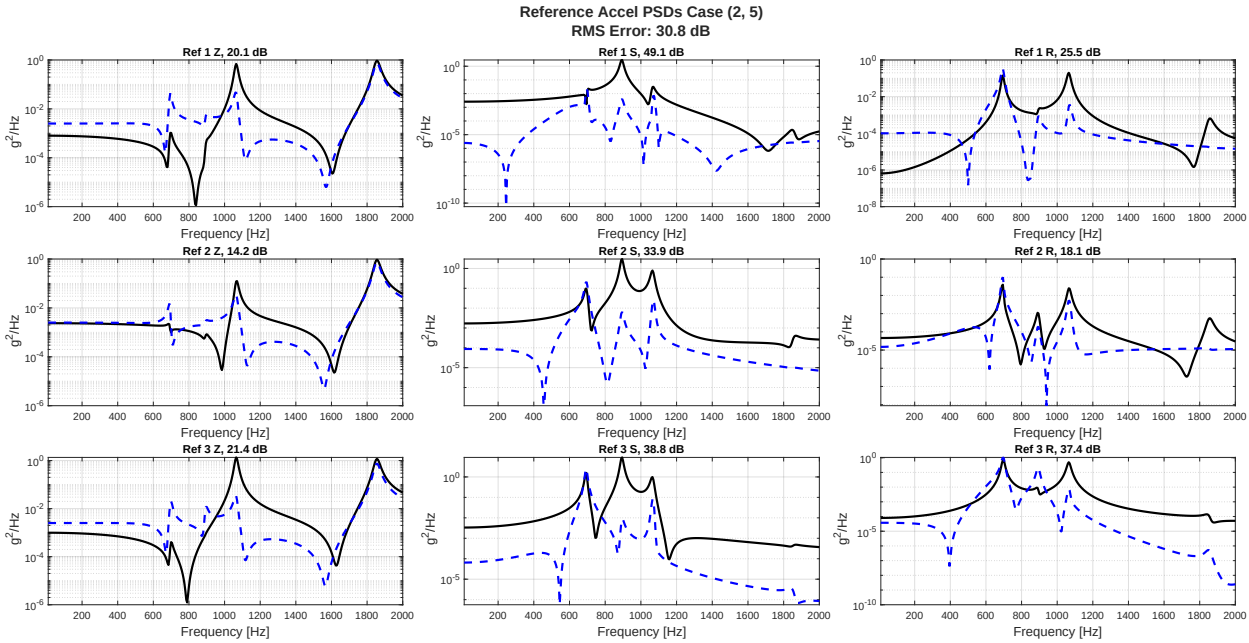


Figure 84: Reference Accels, No Noise, Case (2,5)

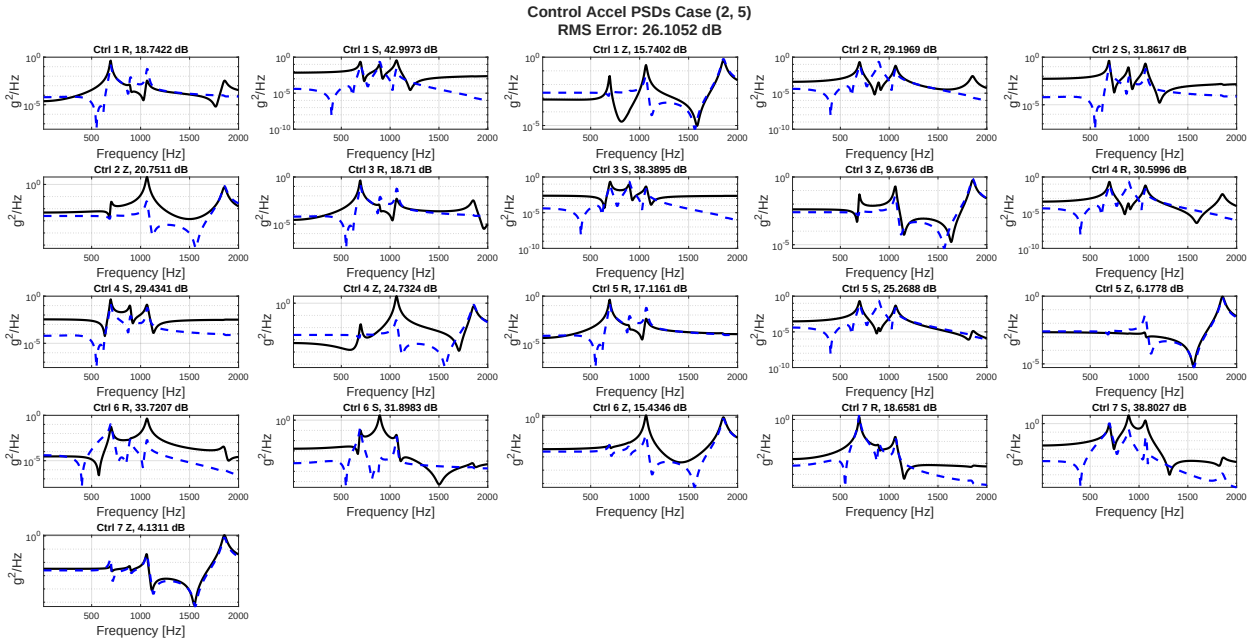


Figure 85: Control Accels, No Noise, Case (2,5)

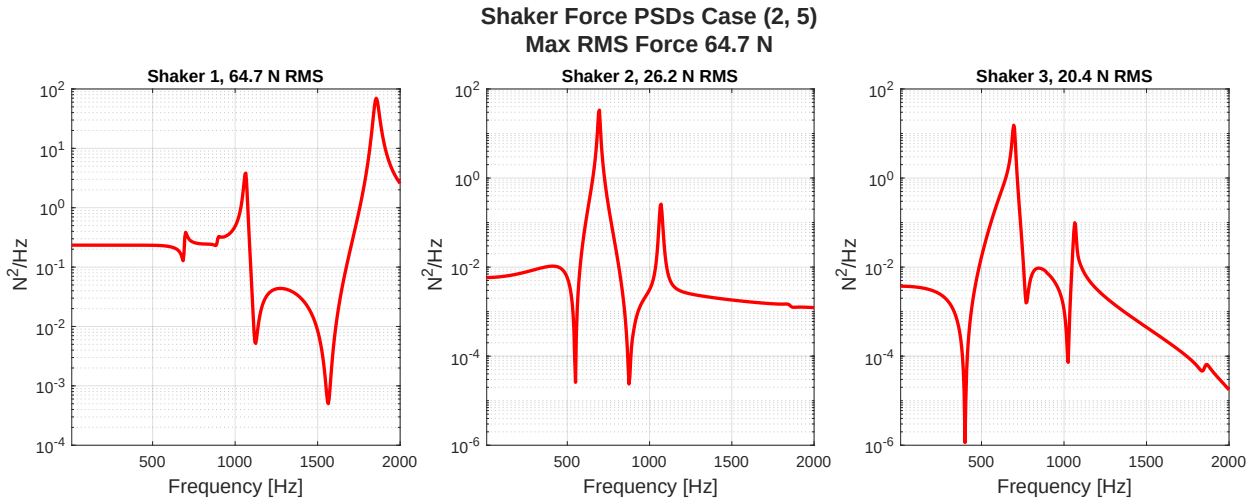


Figure 86: Shaker Forces, No Noise, Case (2,5)

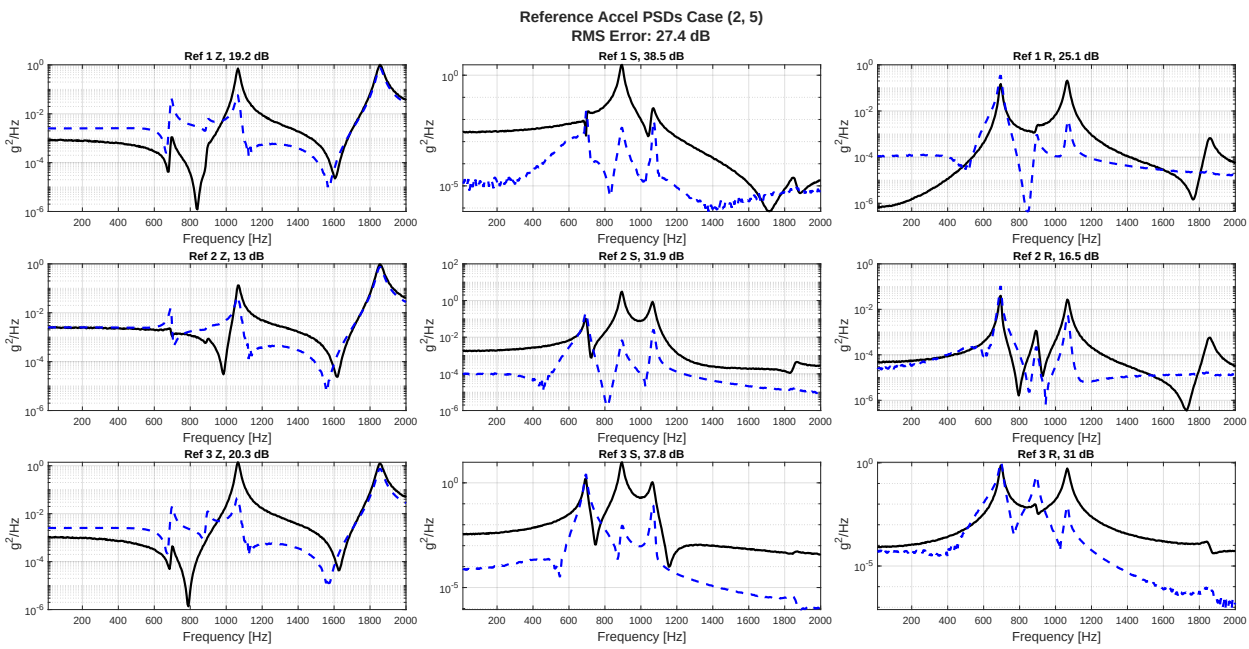


Figure 87: Reference Accels, Noise, No CN, Case (2,5)

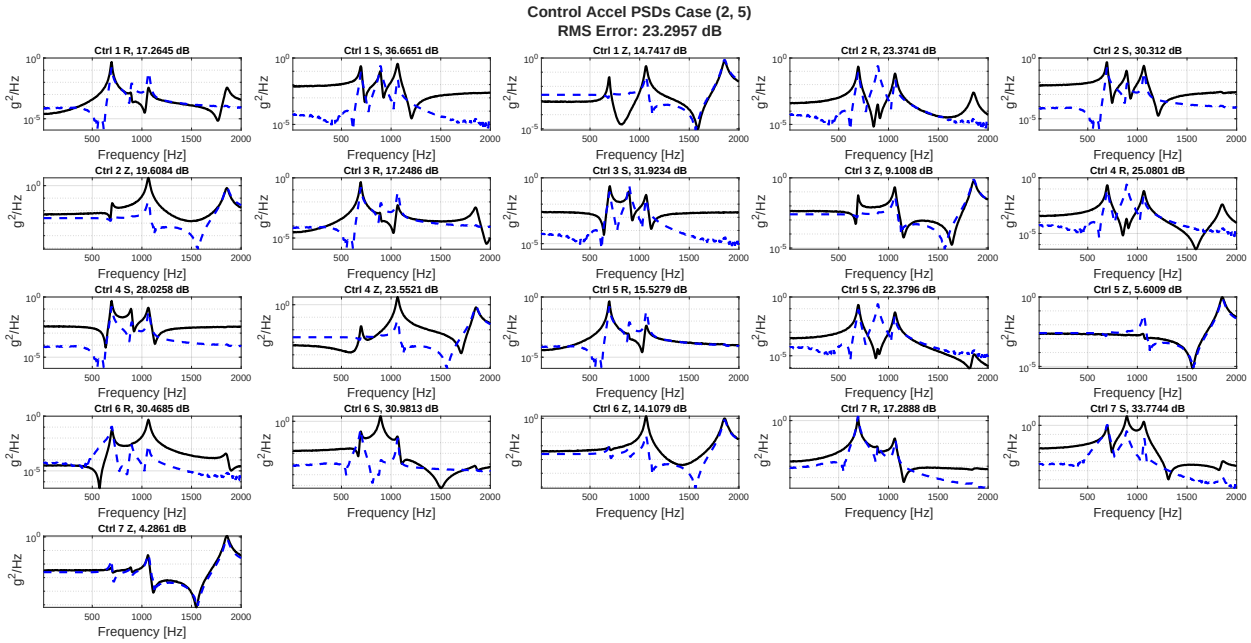


Figure 88: Control Accels, Noise, No CN, Case (2,5)

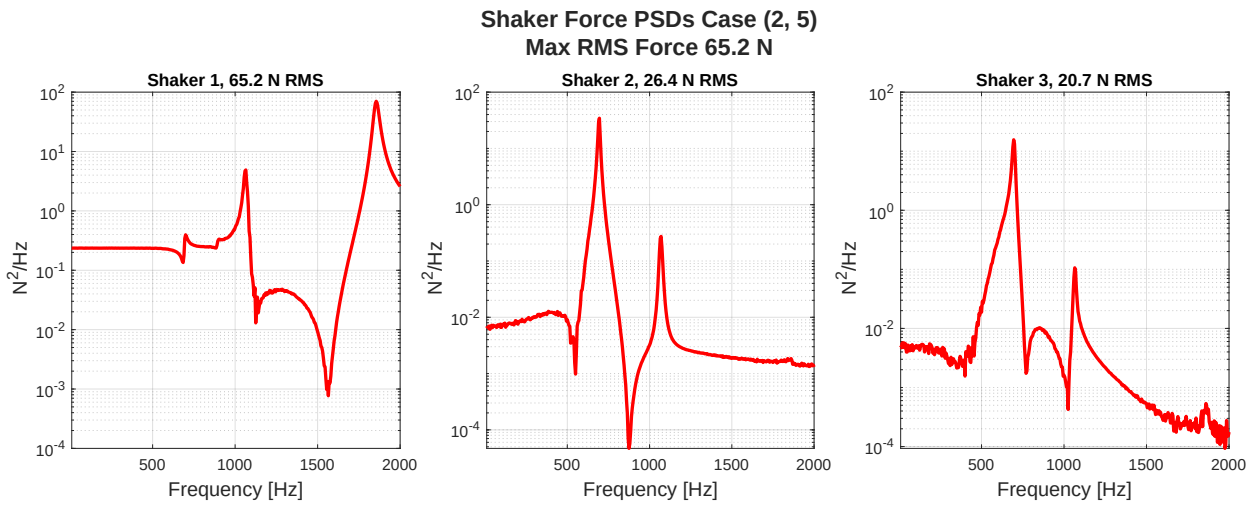


Figure 89: Shaker Forces, Noise, No CN, Case (2,5)

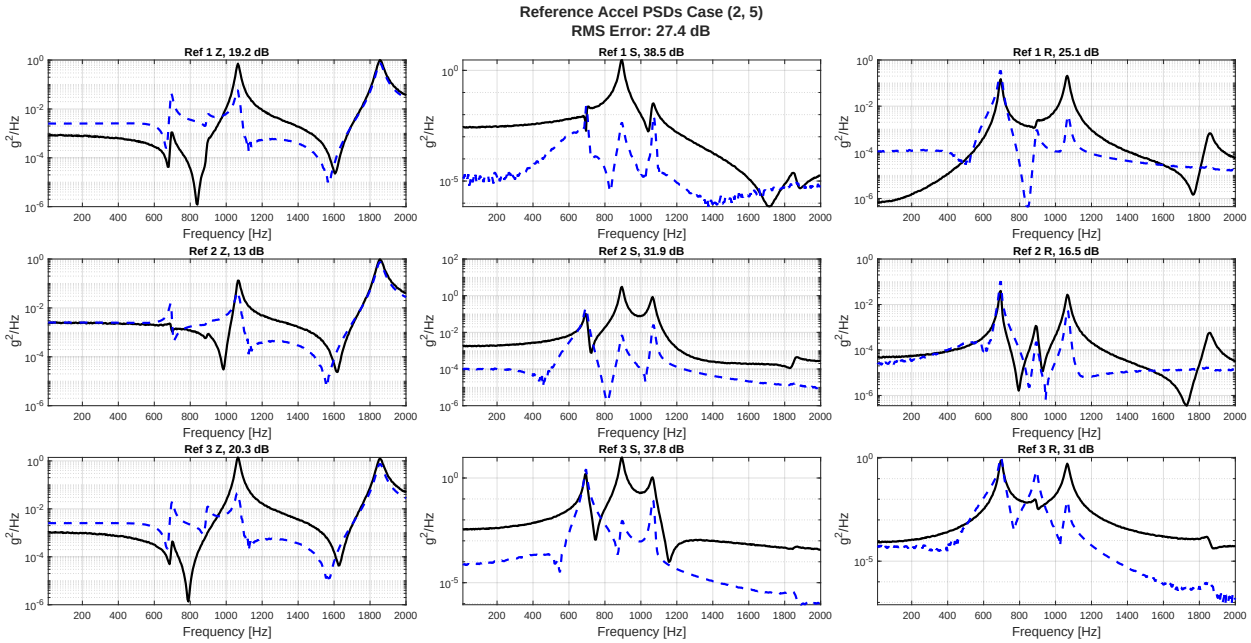


Figure 90: Reference Accels, Noise, with CN, Case (2,5)

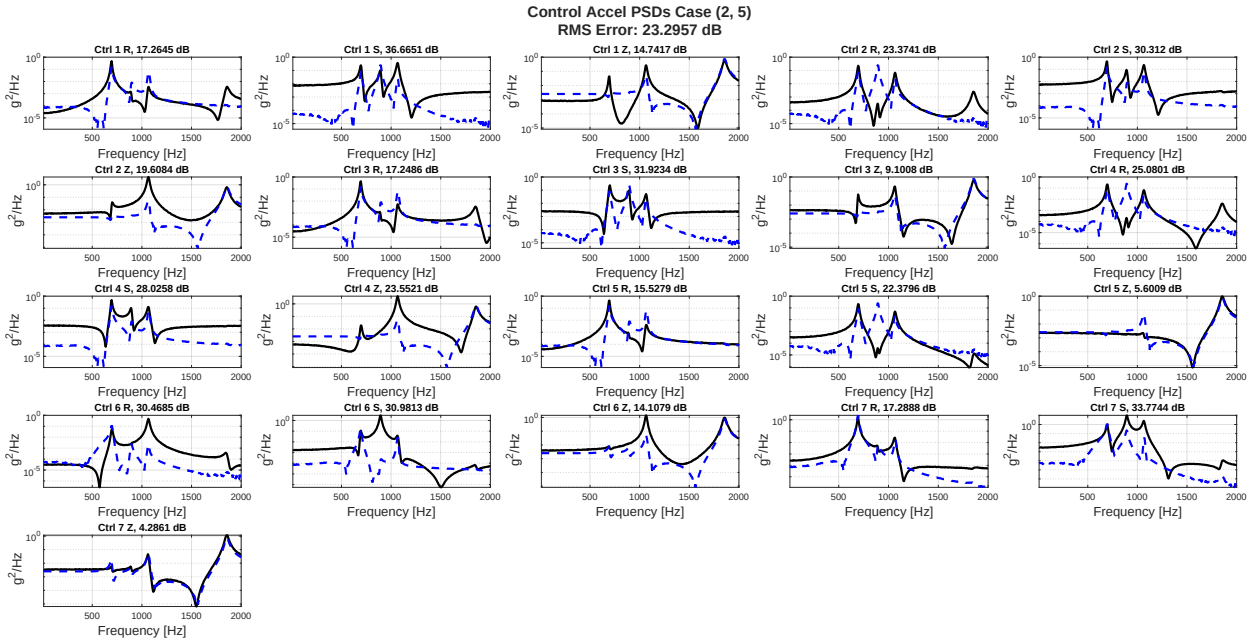


Figure 91: Control Accels, Noise, with CN, Case (2,5)

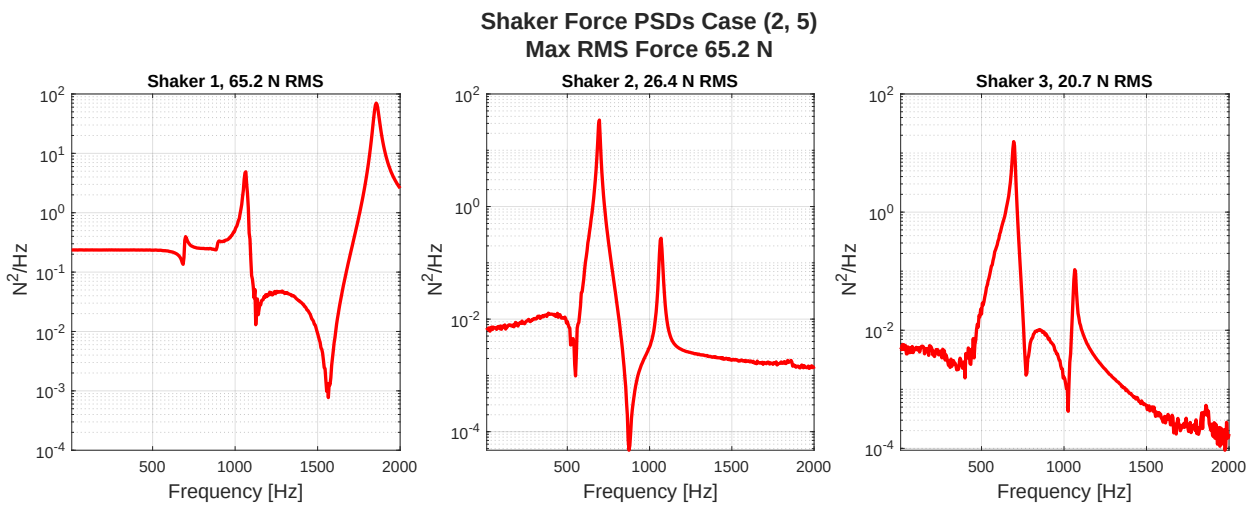


Figure 92: Shaker Forces, Noise, with CN, Case (2,5)

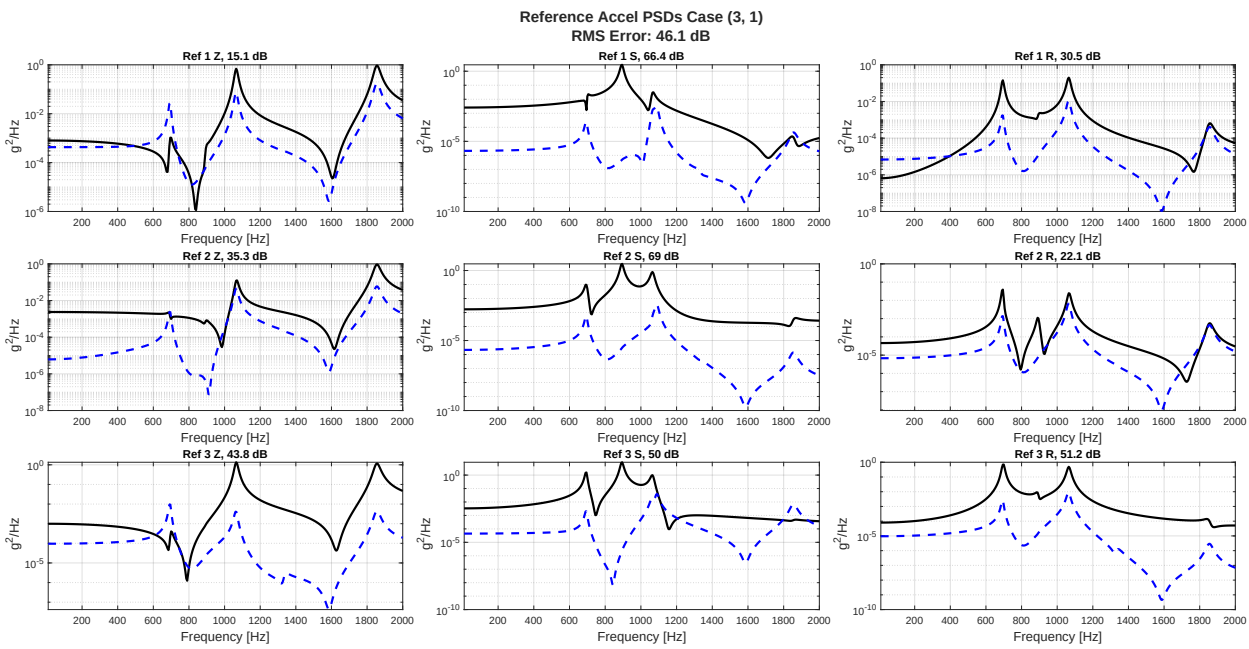


Figure 93: Reference Accels, No Noise, Case (3,1)

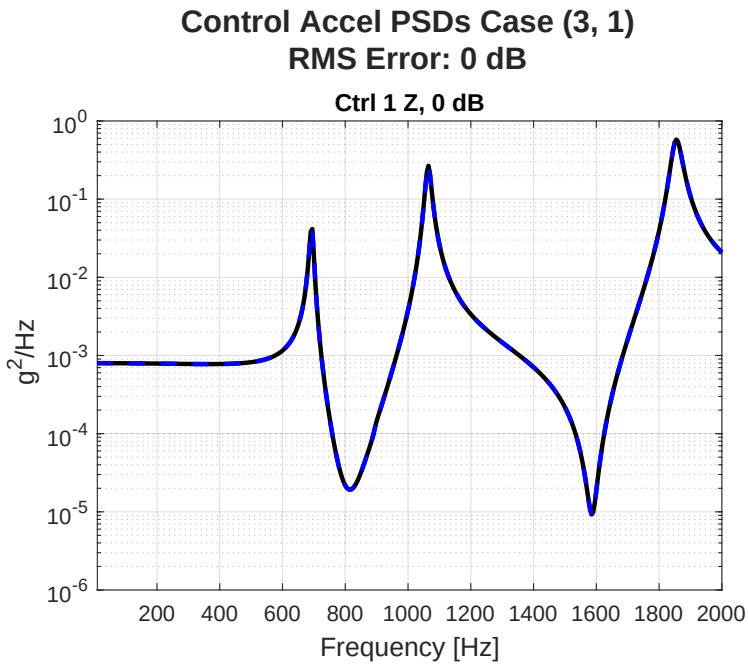


Figure 94: Control Accels, No Noise, Case (3,1)

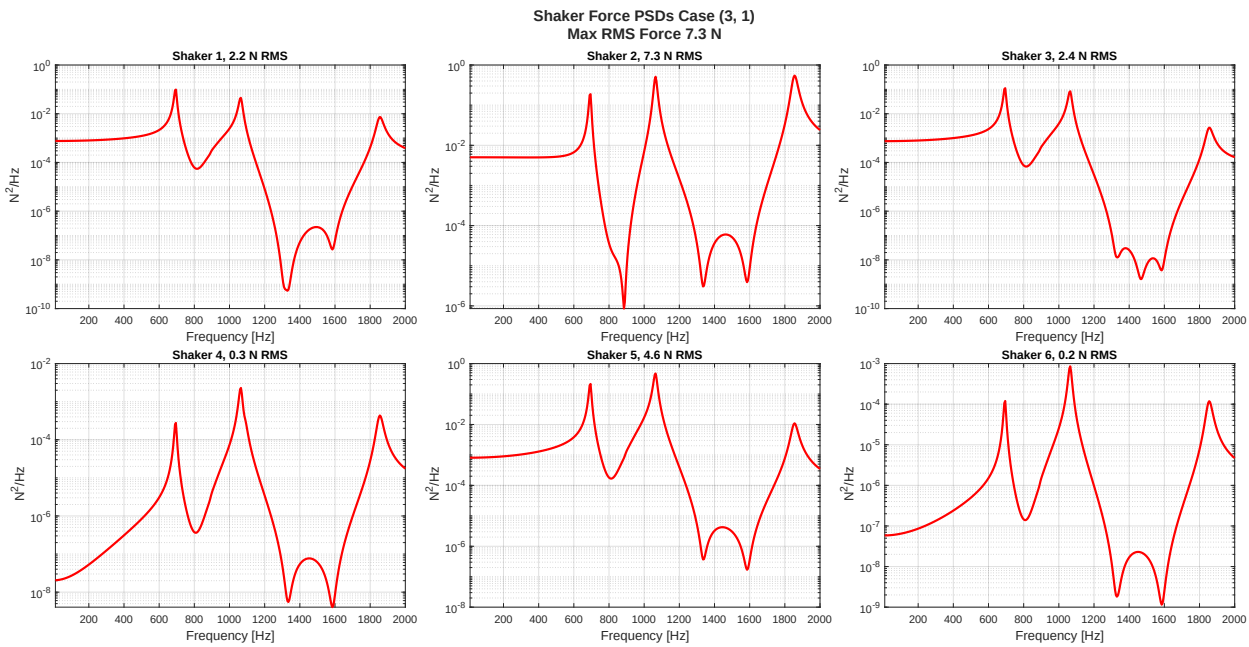


Figure 95: Shaker Forces, No Noise, Case (3,1)

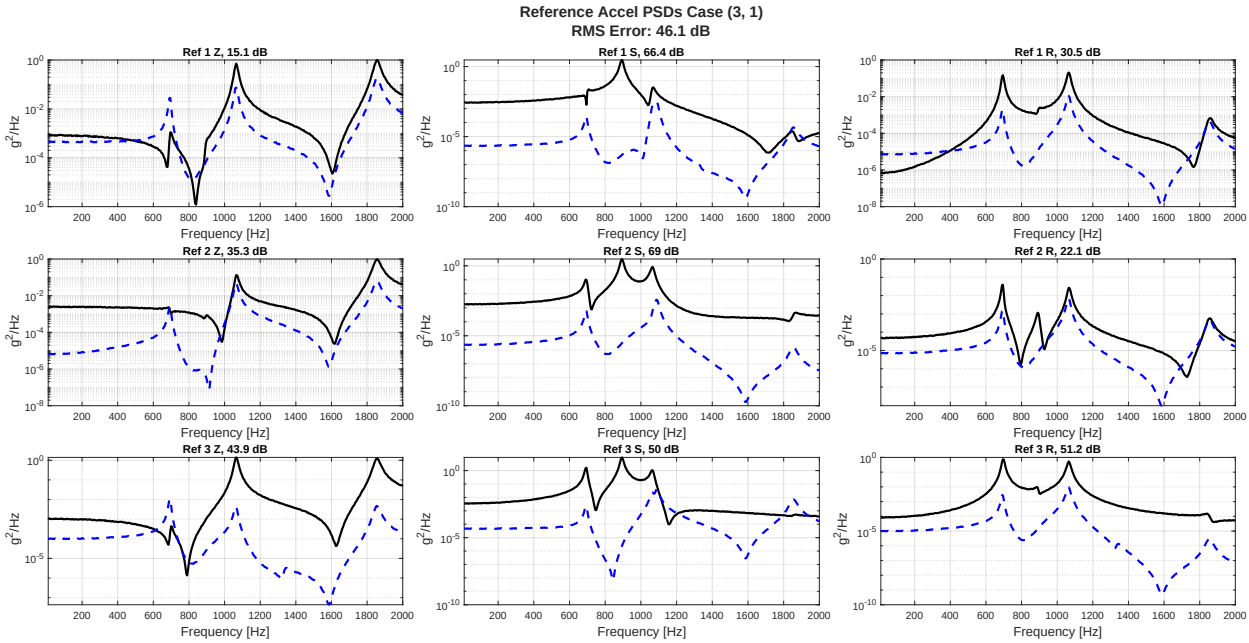


Figure 96: Reference Accels, Noise, No CN, Case (3,1)

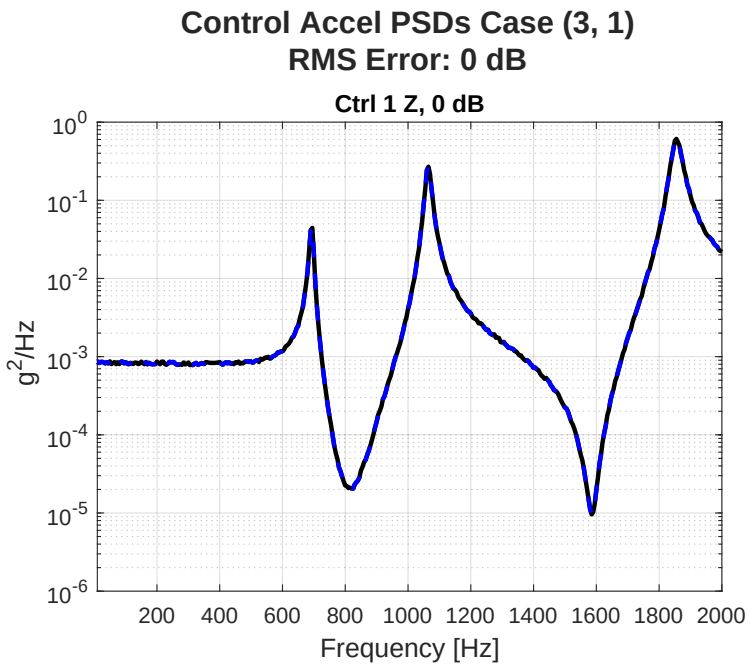


Figure 97: Control Accels, Noise, No CN, Case (3,1)

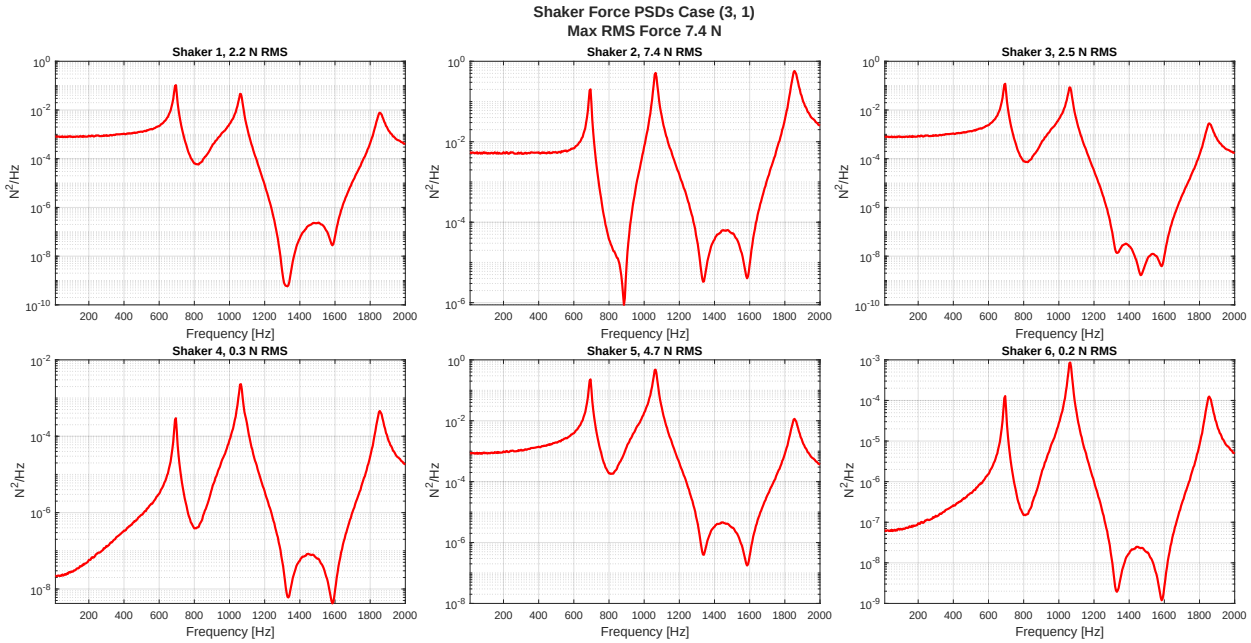


Figure 98: Shaker Forces, Noise, No CN, Case (3,1)

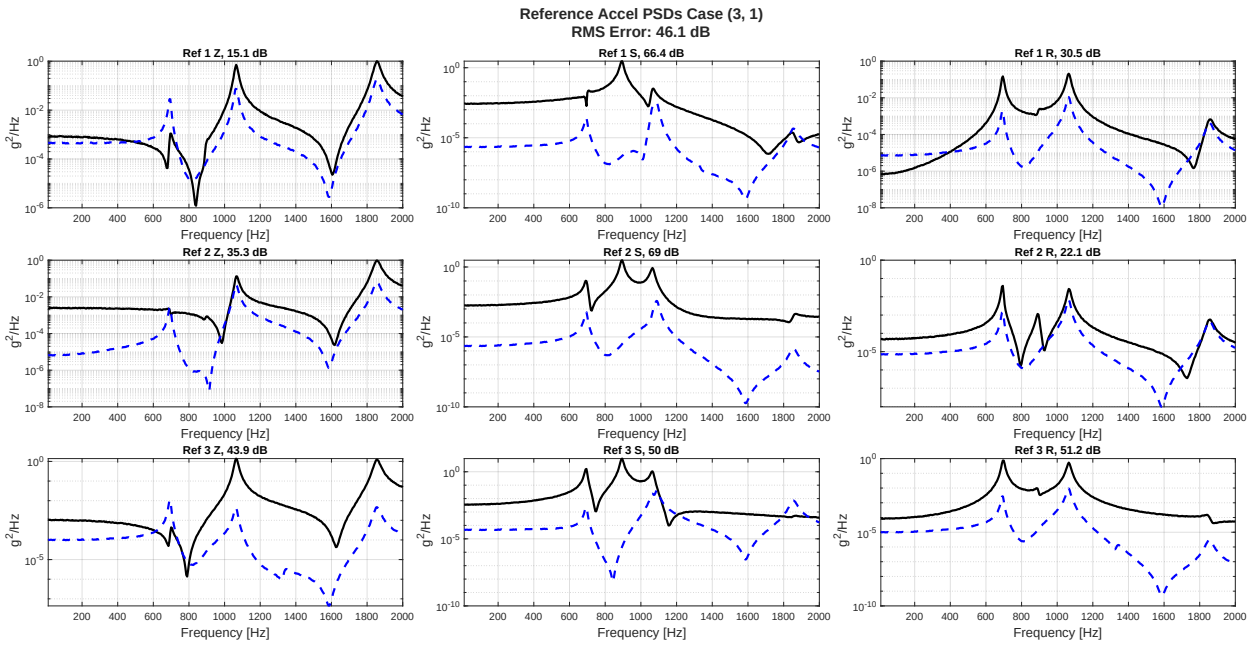


Figure 99: Reference Accels, Noise, with CN, Case (3,1)

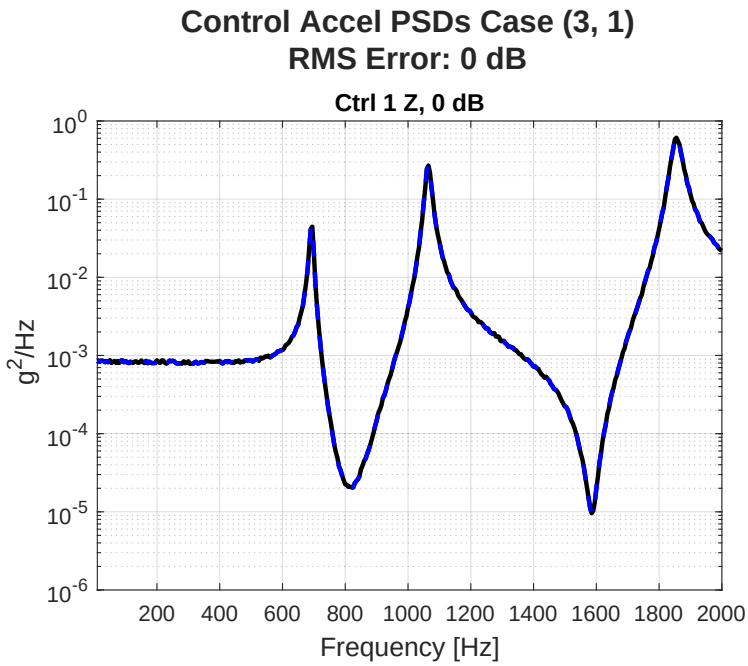


Figure 100: Control Accels, Noise, with CN, Case (3,1)

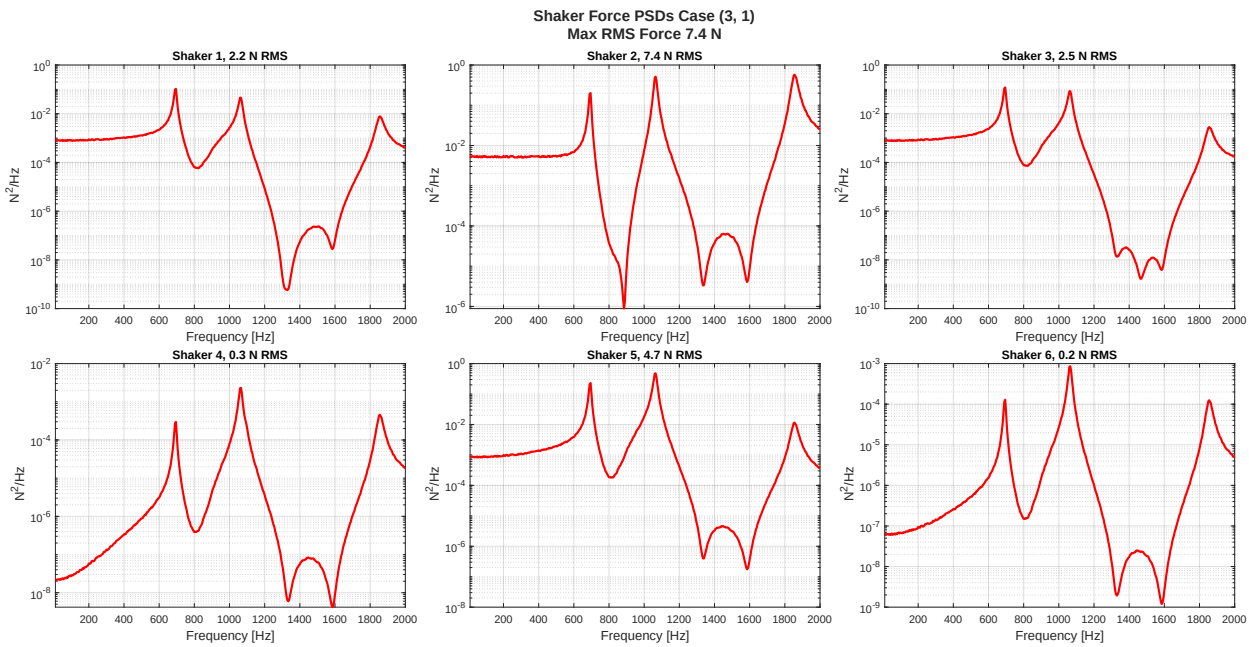


Figure 101: Shaker Forces, Noise, with CN, Case (3,1)

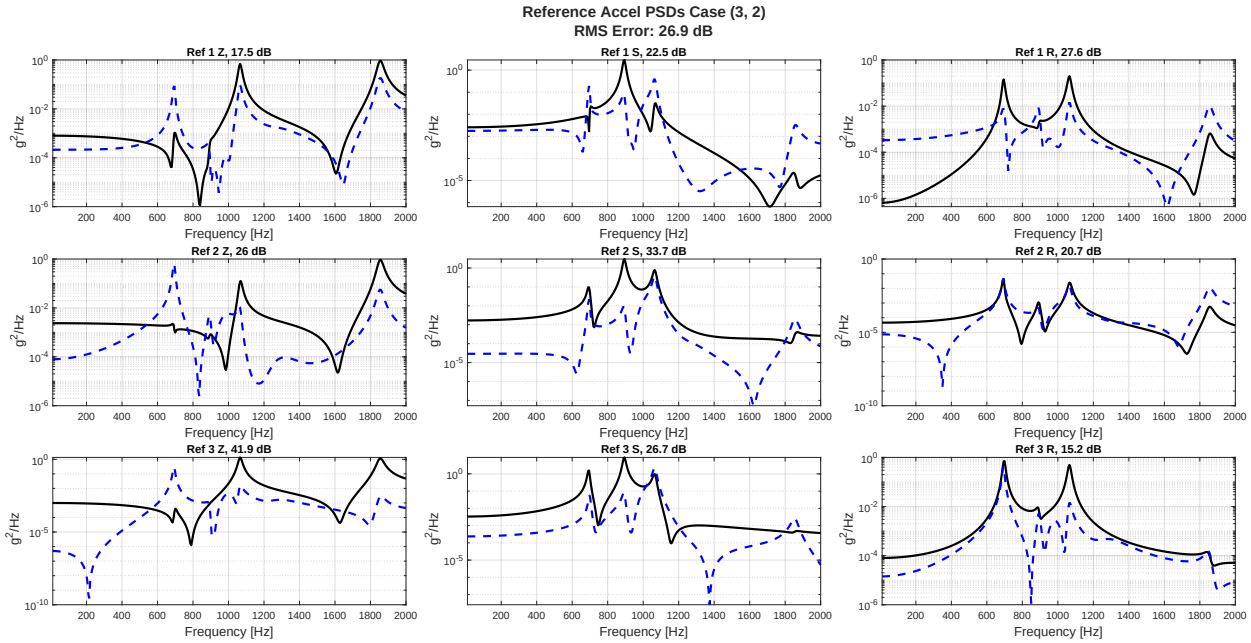


Figure 102: Reference Accels, No Noise, Case (3,2)

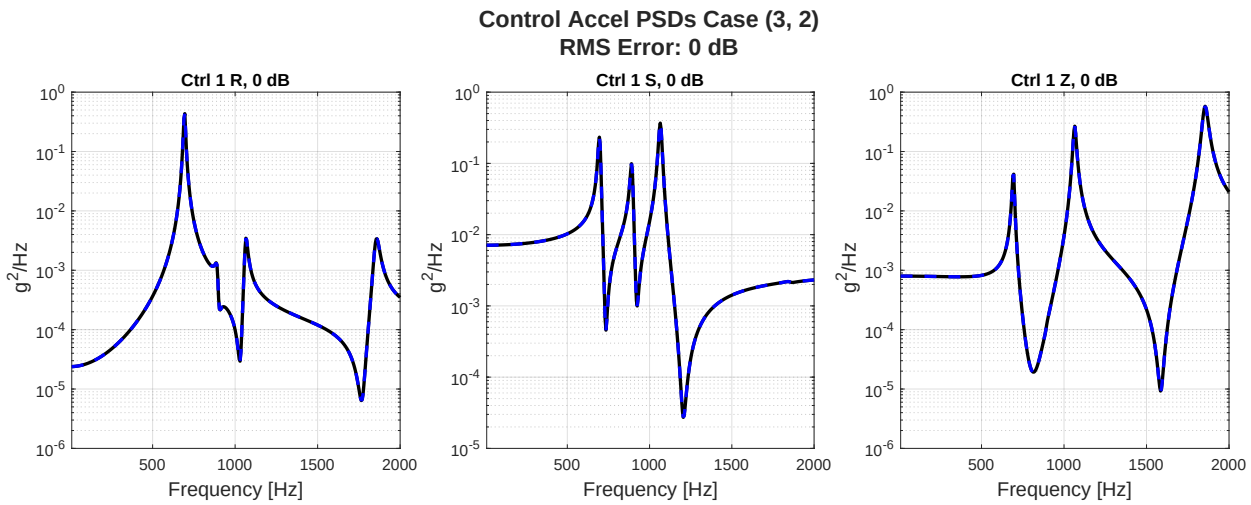


Figure 103: Control Accels, No Noise, Case (3,2)

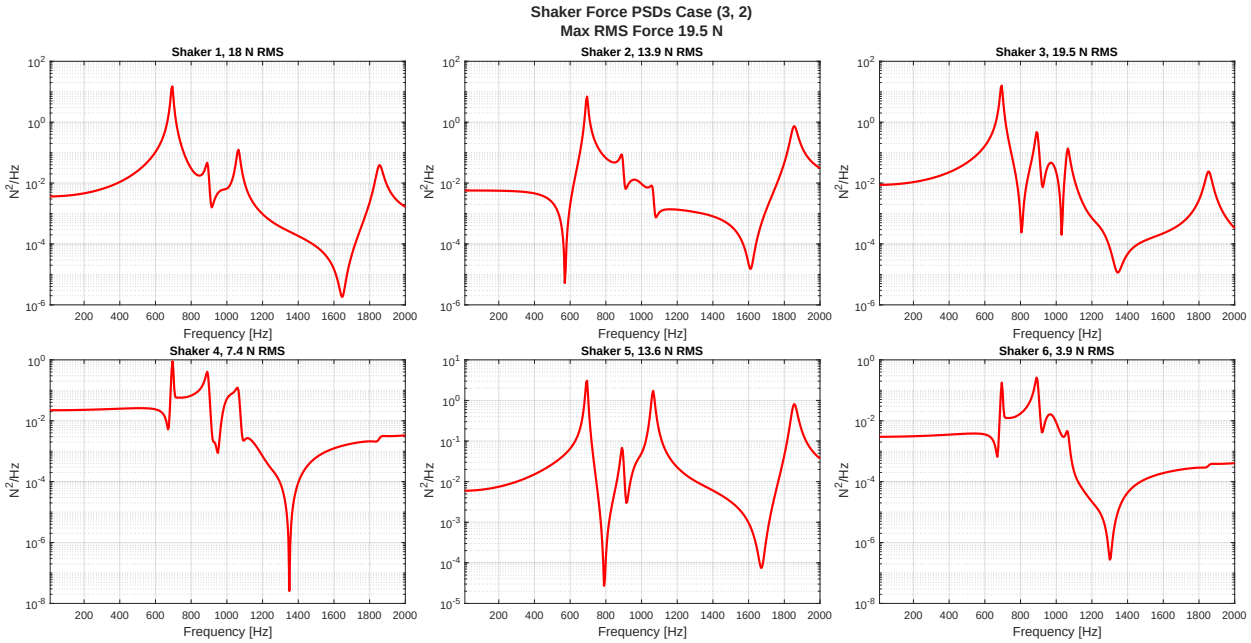


Figure 104: Shaker Forces, No Noise, Case (3,2)

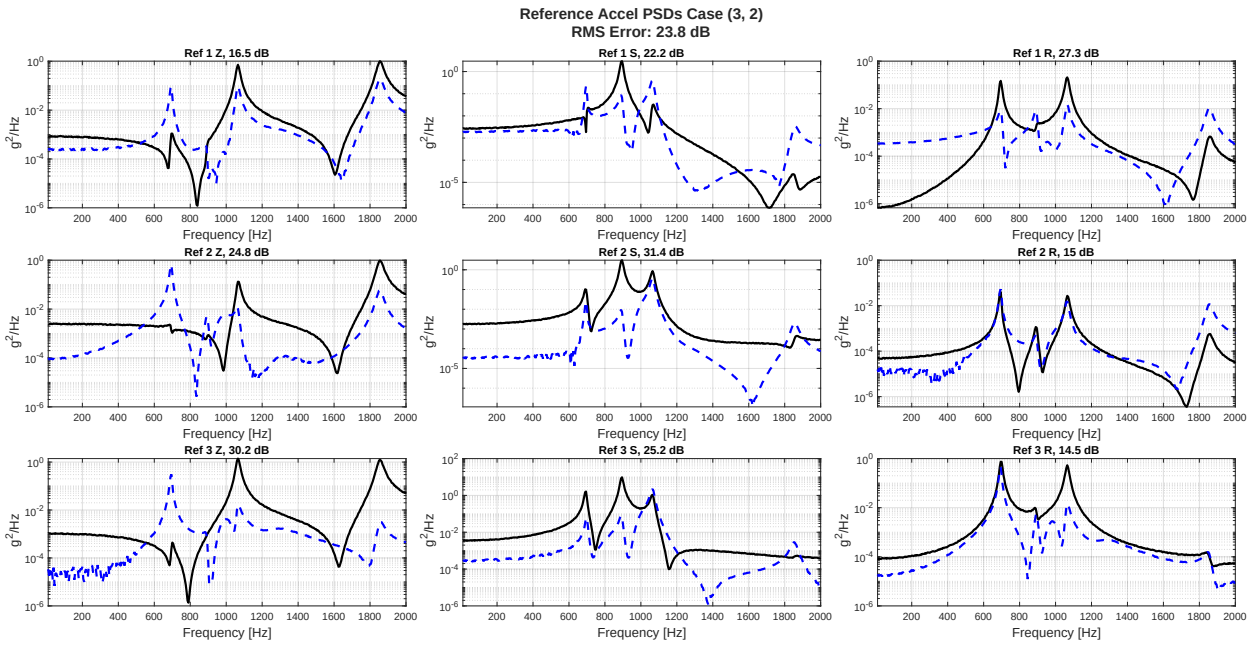


Figure 105: Reference Accels, Noise, No CN, Case (3,2)

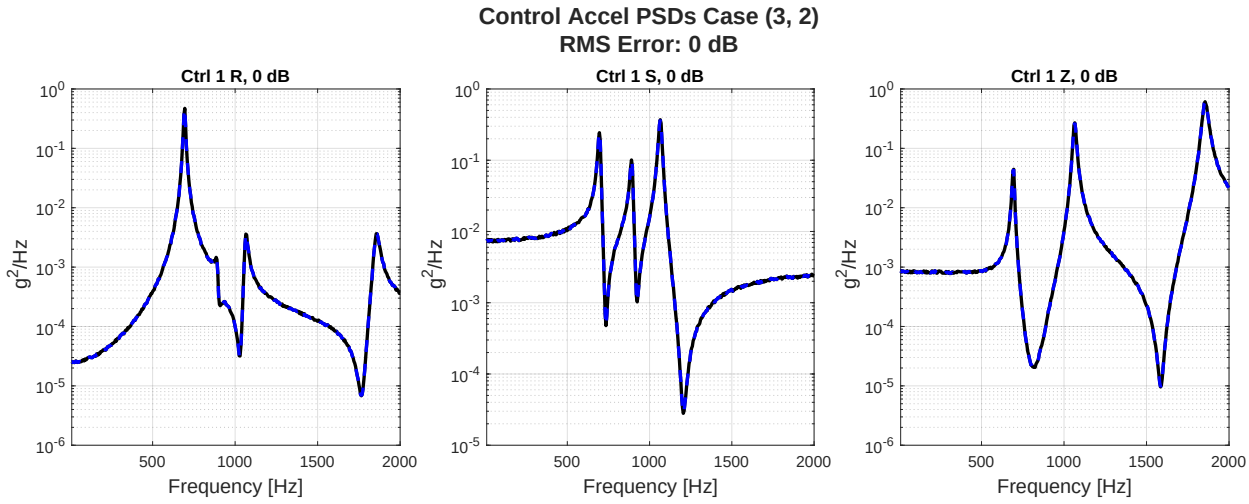


Figure 106: Control Accels, Noise, No CN, Case (3,2)

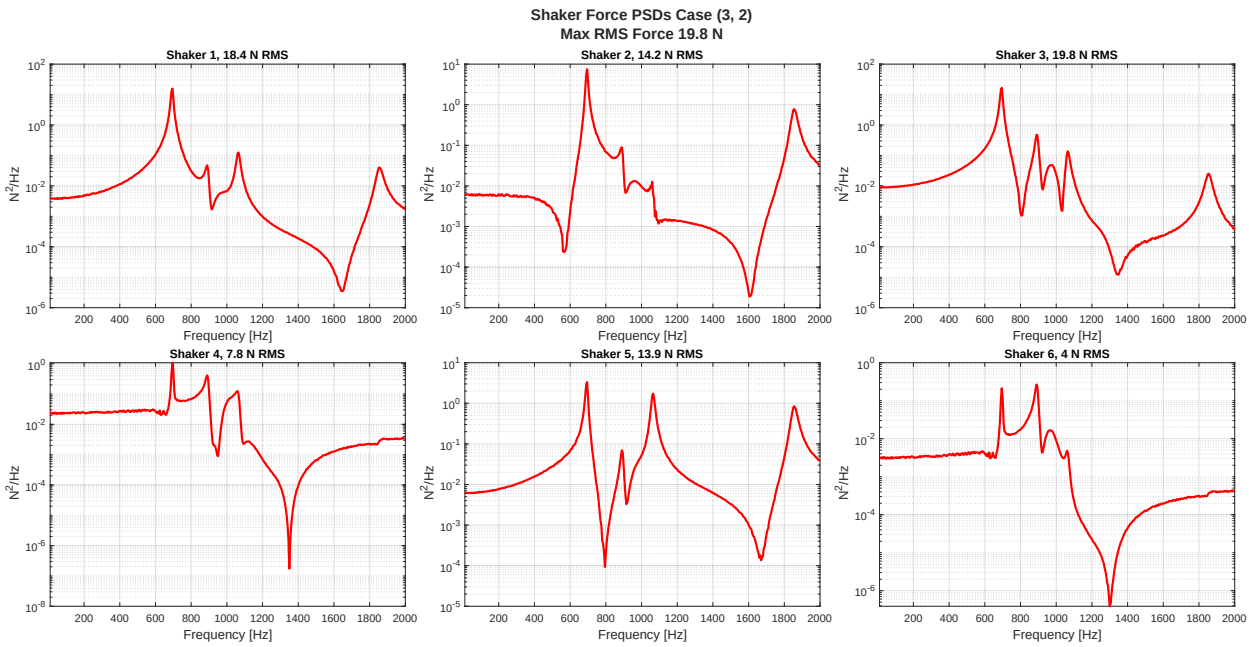


Figure 107: Shaker Forces, Noise, No CN, Case (3,2)

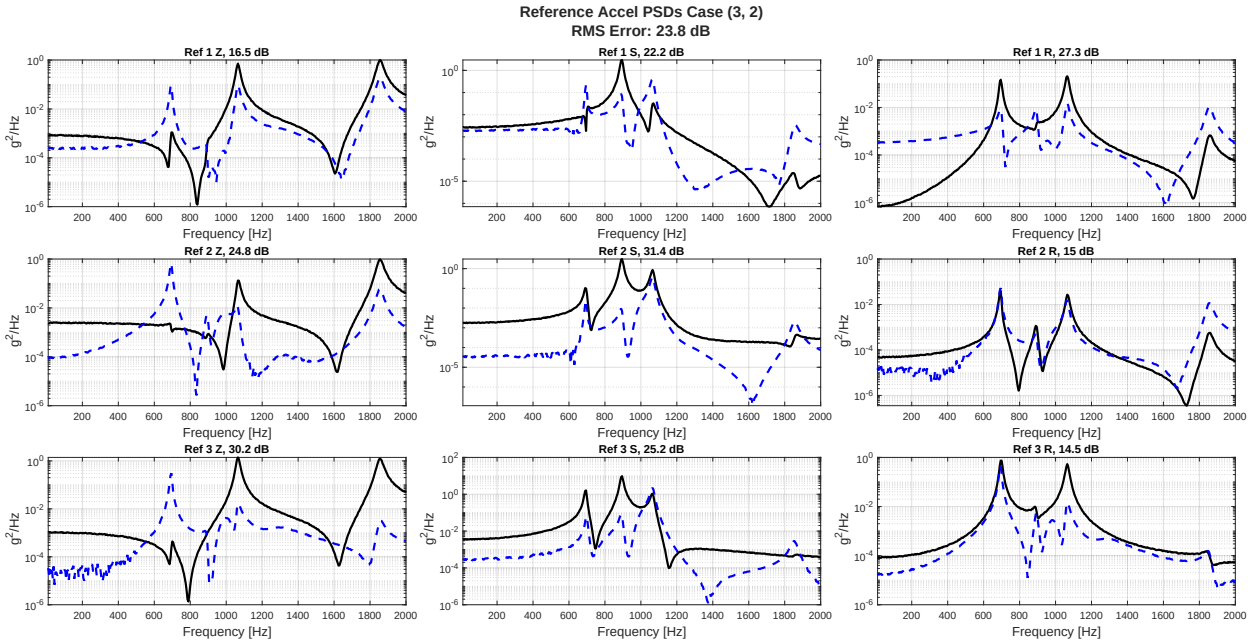


Figure 108: Reference Accels, Noise, with CN, Case (3,2)

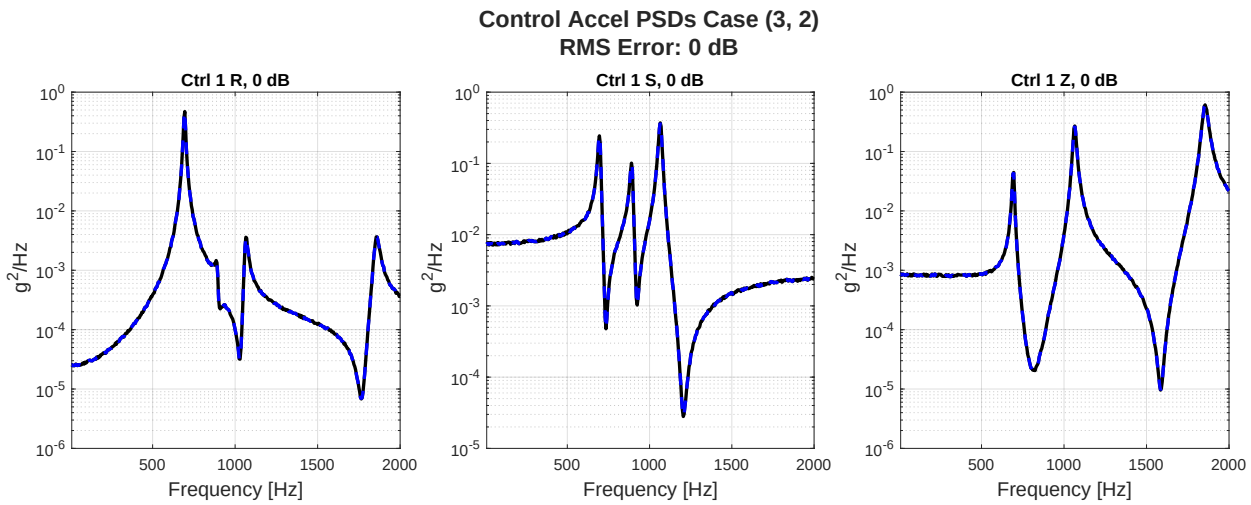


Figure 109: Control Accels, Noise, with CN, Case (3,2)

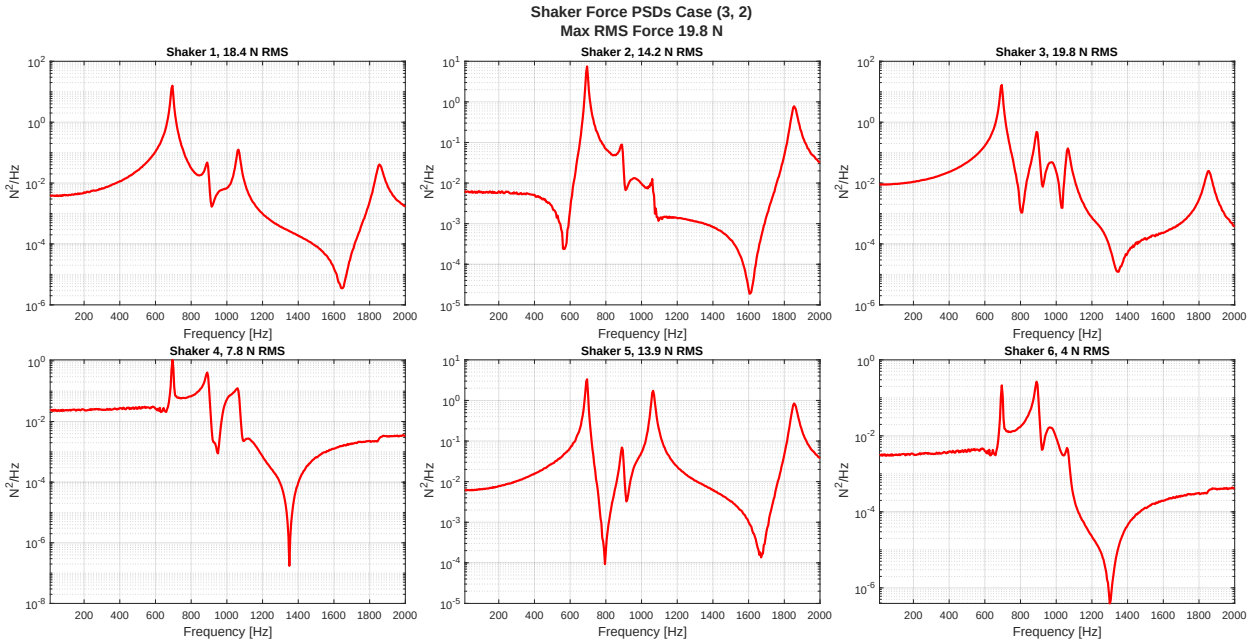


Figure 110: Shaker Forces, Noise, with CN, Case (3,2)

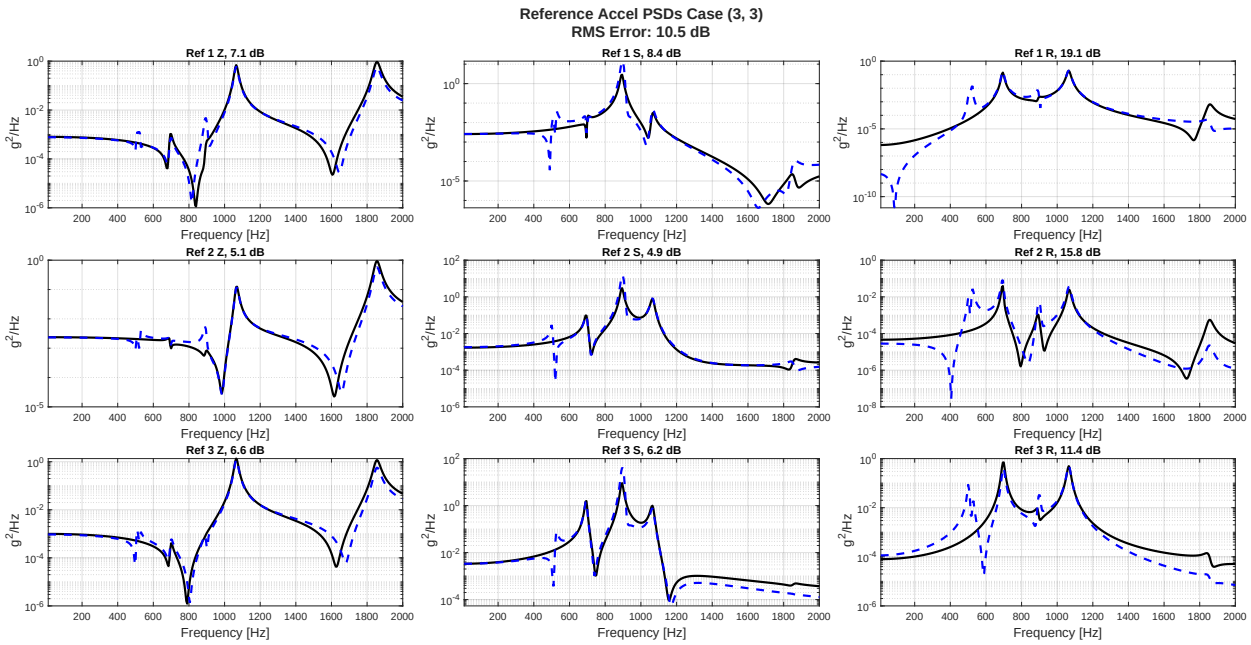


Figure 111: Reference Accels, No Noise, Case (3,3)

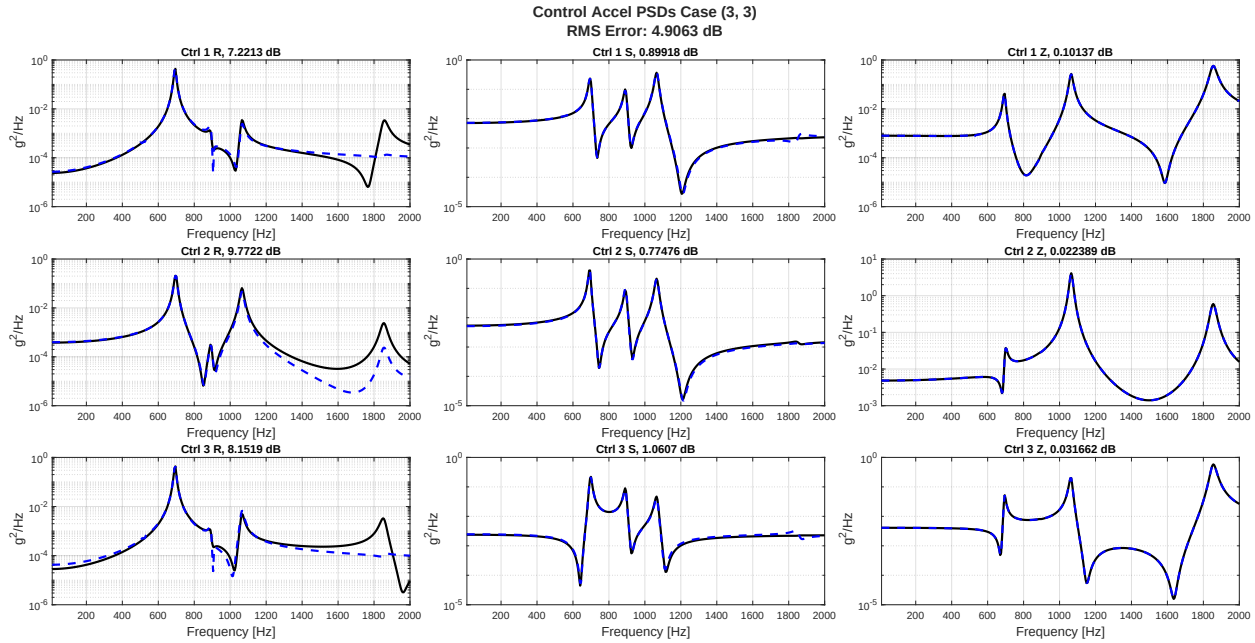


Figure 112: Control Accels, No Noise, Case (3,3)

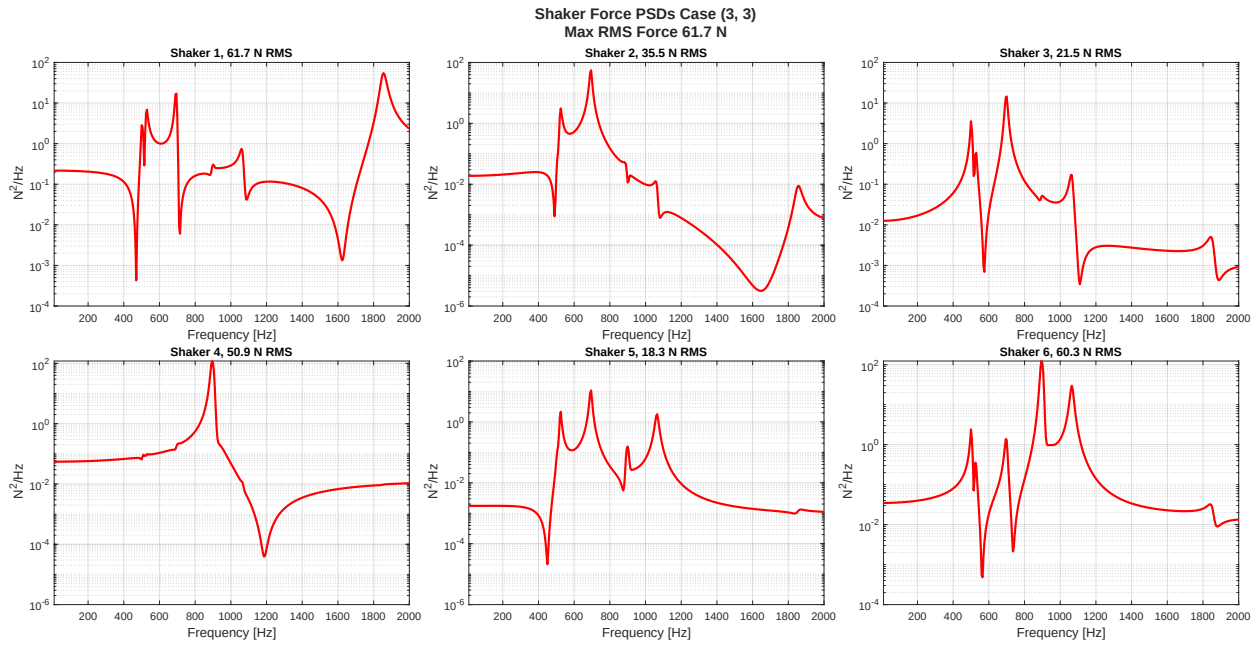


Figure 113: Shaker Forces, No Noise, Case (3,3)

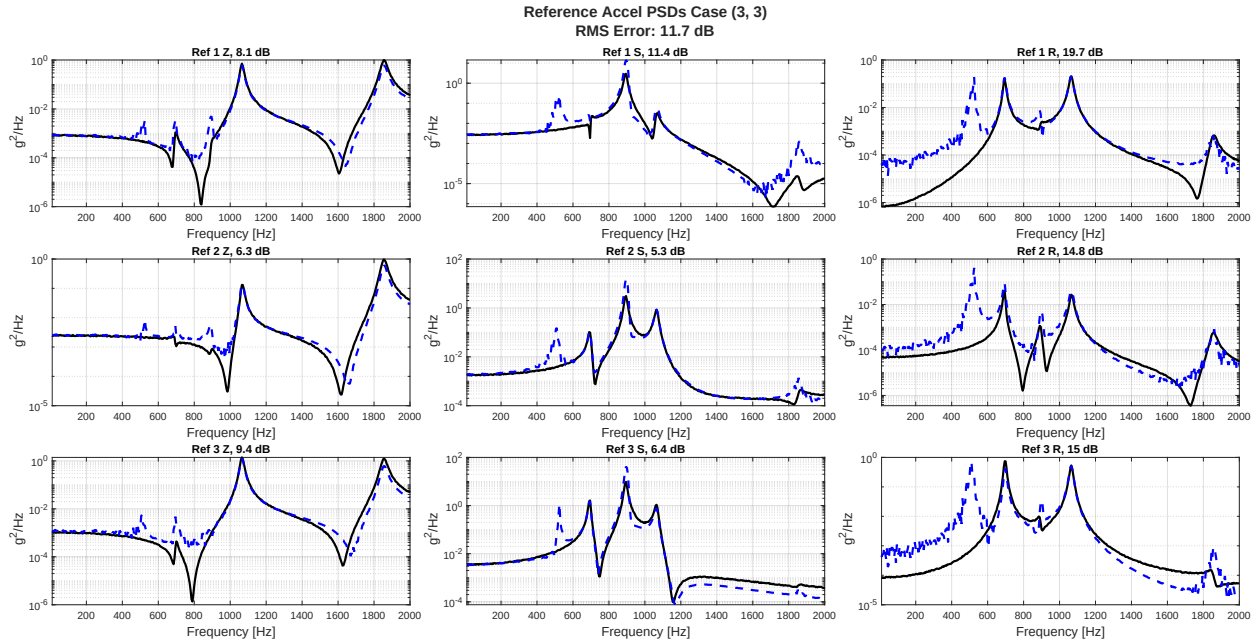


Figure 114: Reference Accels, Noise, No CN, Case (3,3)

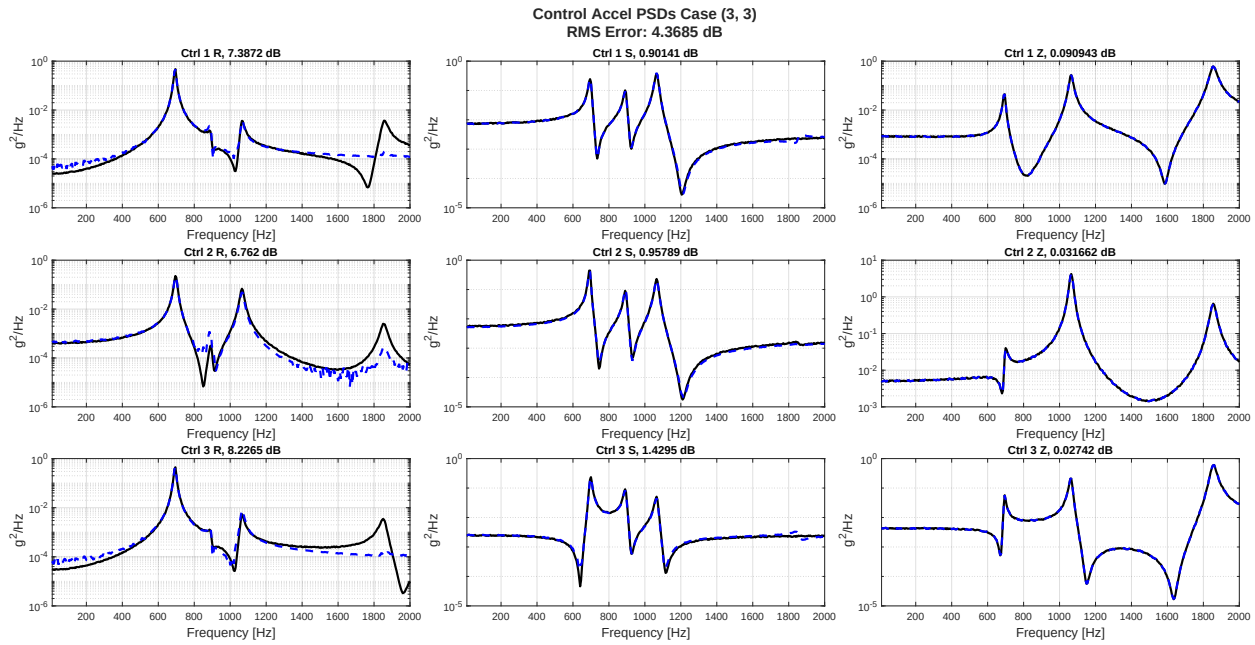


Figure 115: Control Accels, Noise, No CN, Case (3,3)

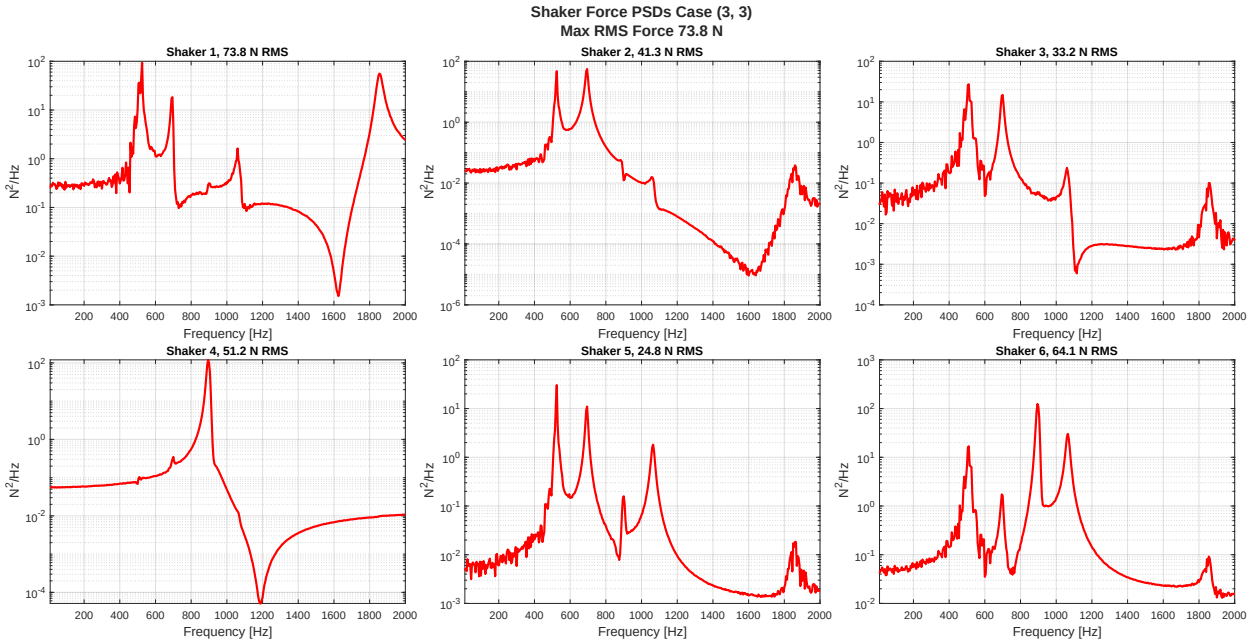


Figure 116: Shaker Forces, Noise, No CN, Case (3,3)

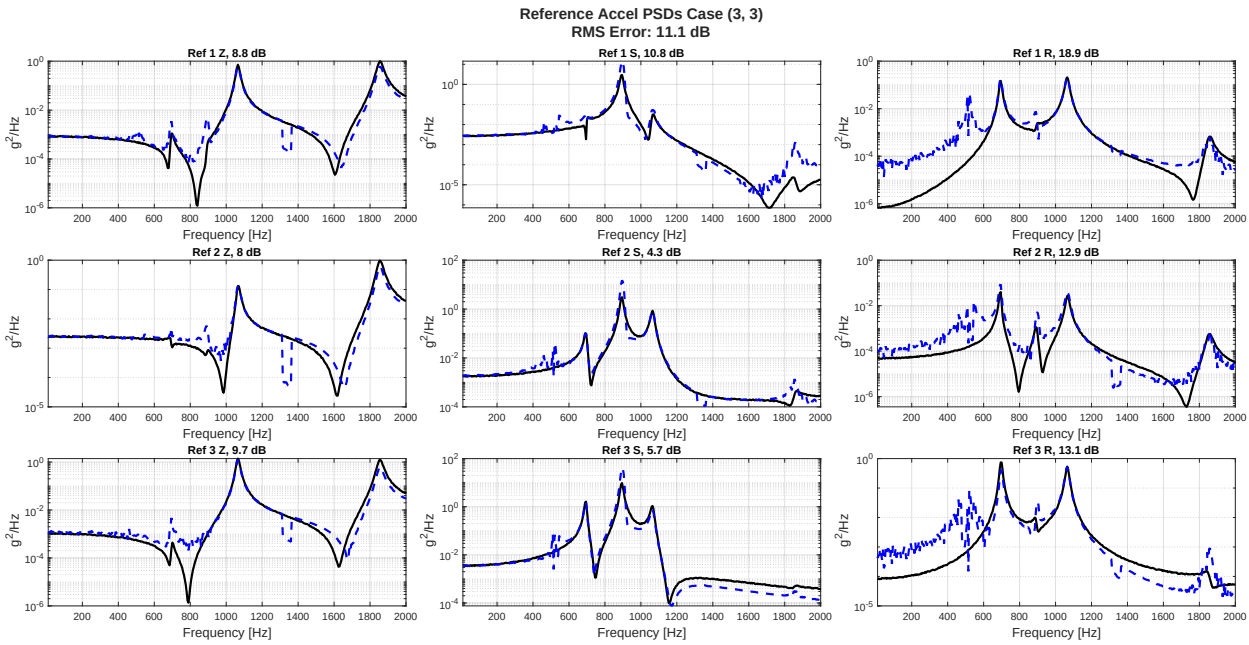


Figure 117: Reference Accels, Noise, with CN, Case (3,3)

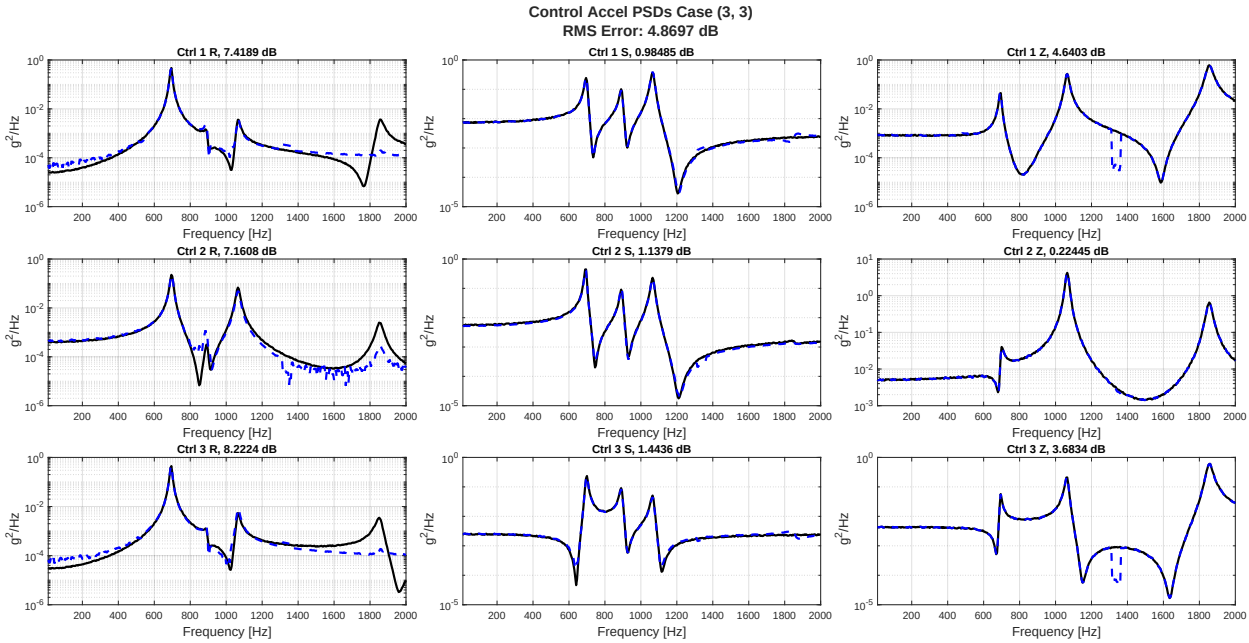


Figure 118: Control Accels, Noise, with CN, Case (3,3)

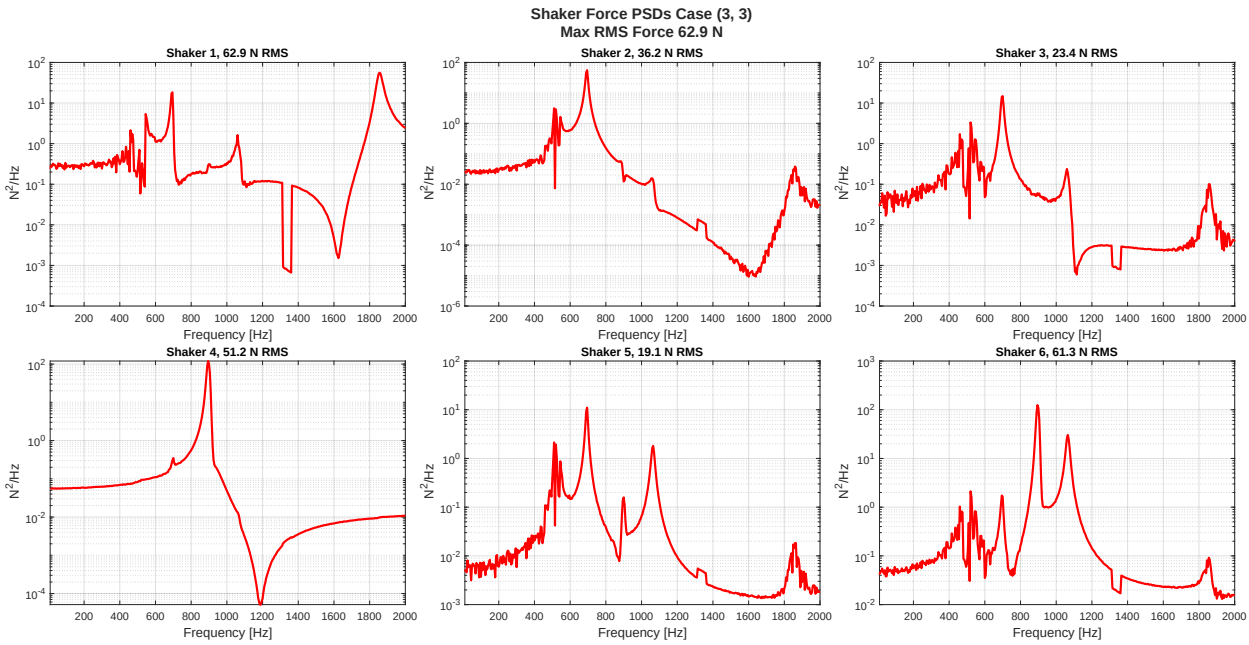


Figure 119: Shaker Forces, Noise, with CN, Case (3,3)

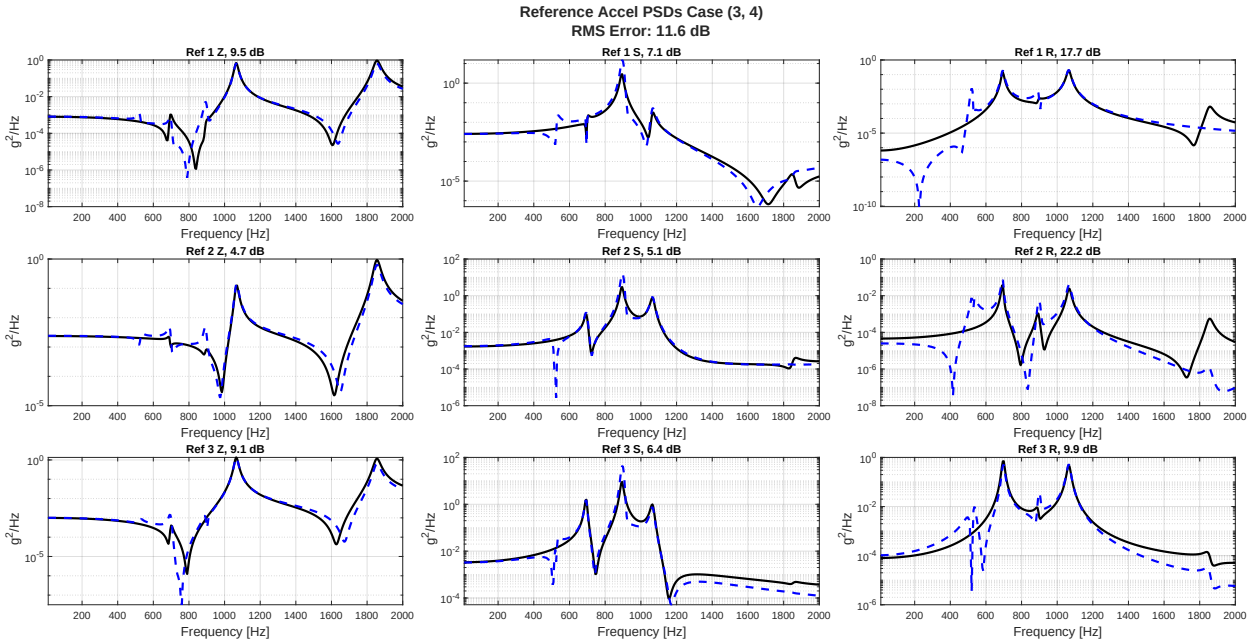


Figure 120: Reference Accels, No Noise, Case (3,4)

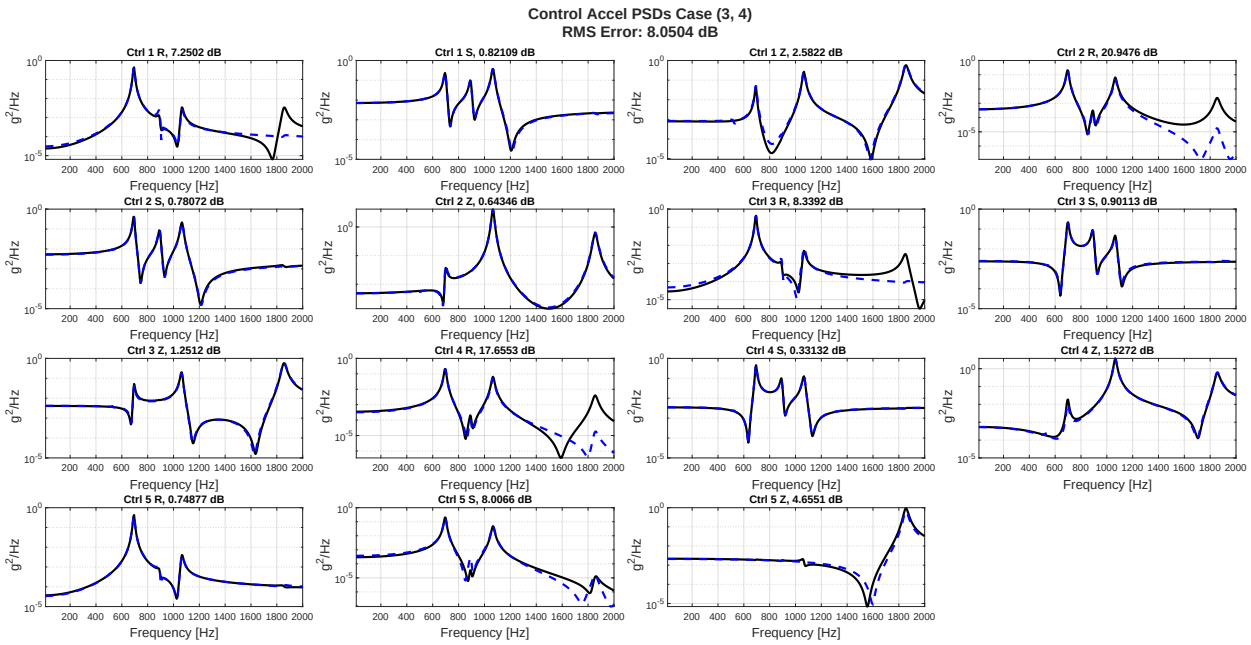


Figure 121: Control Accels, No Noise, Case (3,4)

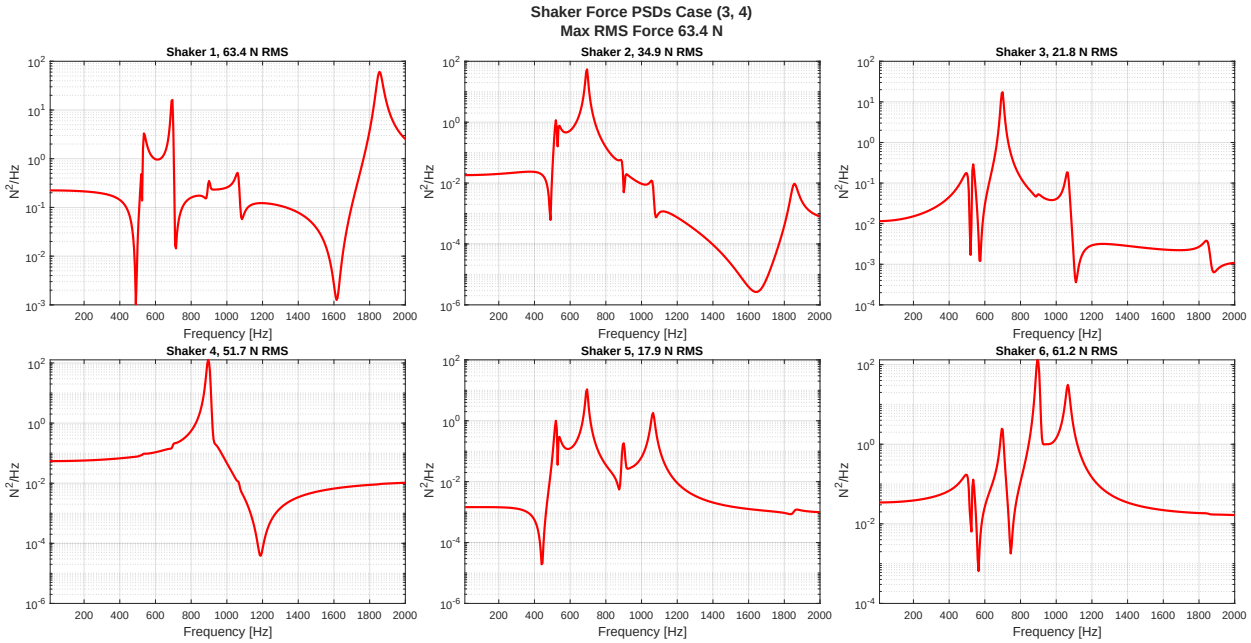


Figure 122: Shaker Forces, No Noise, Case (3,4)

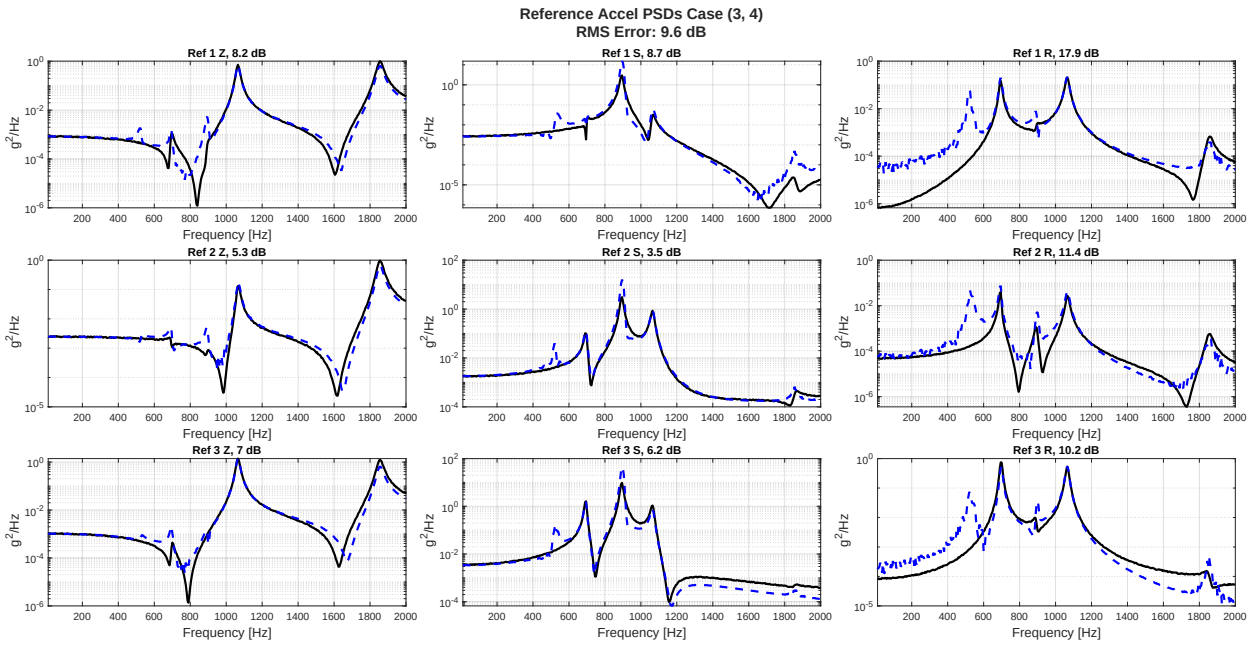


Figure 123: Reference Accels, Noise, No CN, Case (3,4)

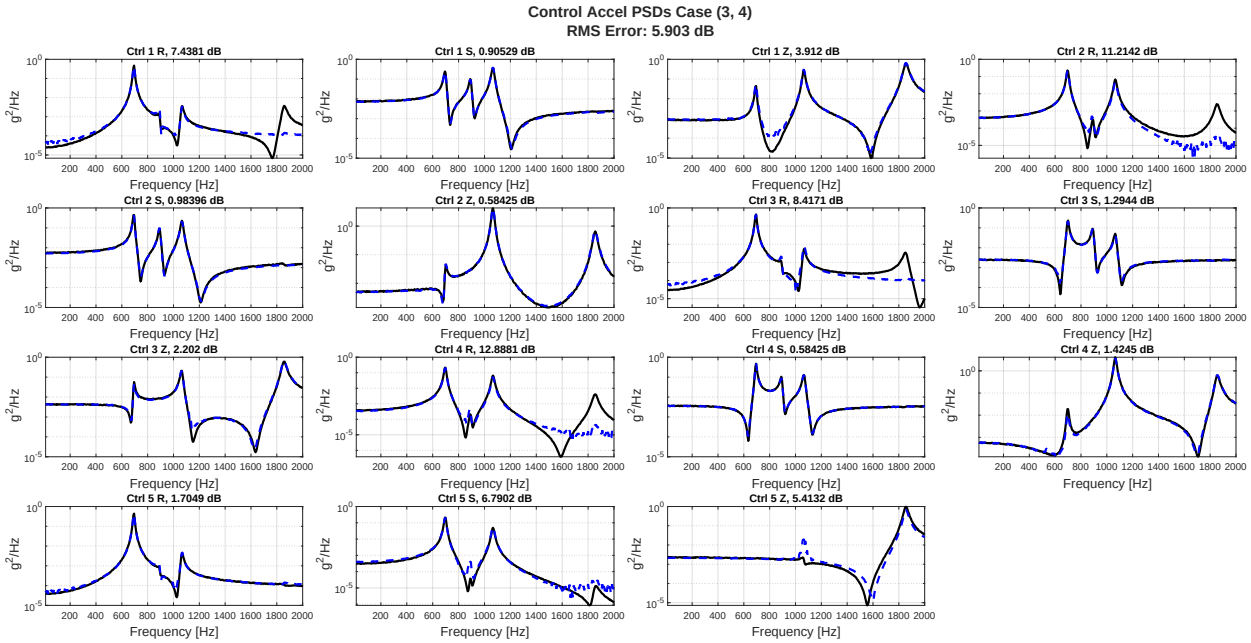


Figure 124: Control Accels, Noise, No CN, Case (3,4)

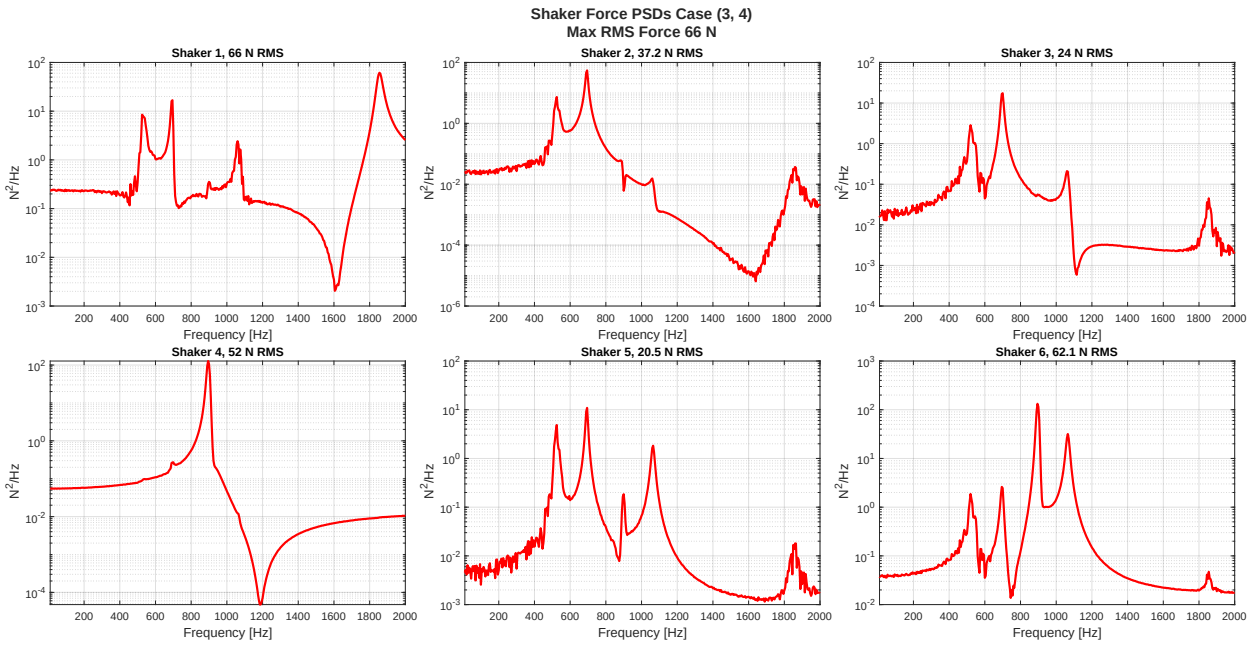


Figure 125: Shaker Forces, Noise, No CN, Case (3,4)

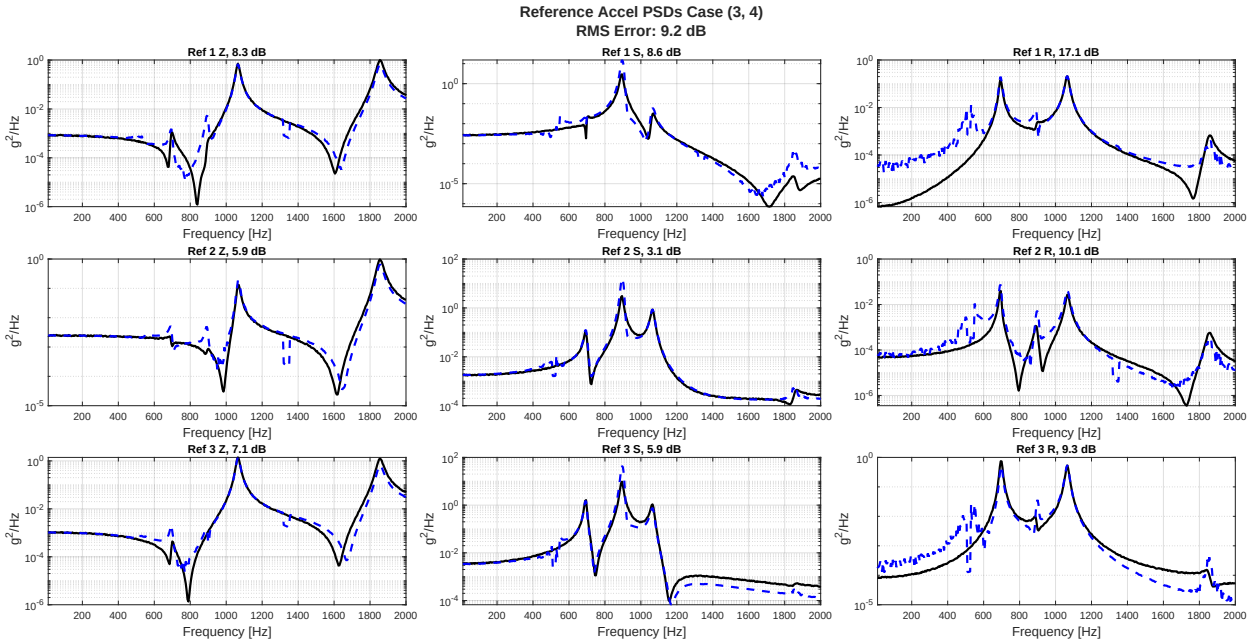


Figure 126: Reference Accels, Noise, with CN, Case (3,4)

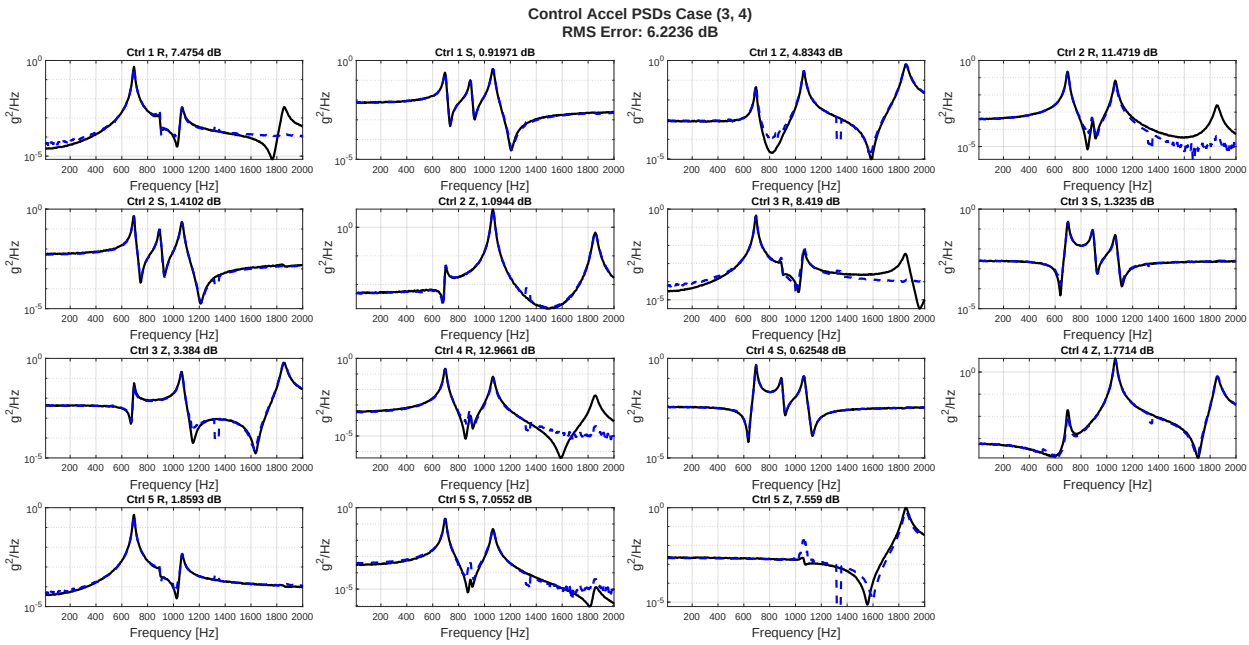


Figure 127: Control Accels, Noise, with CN, Case (3,4)

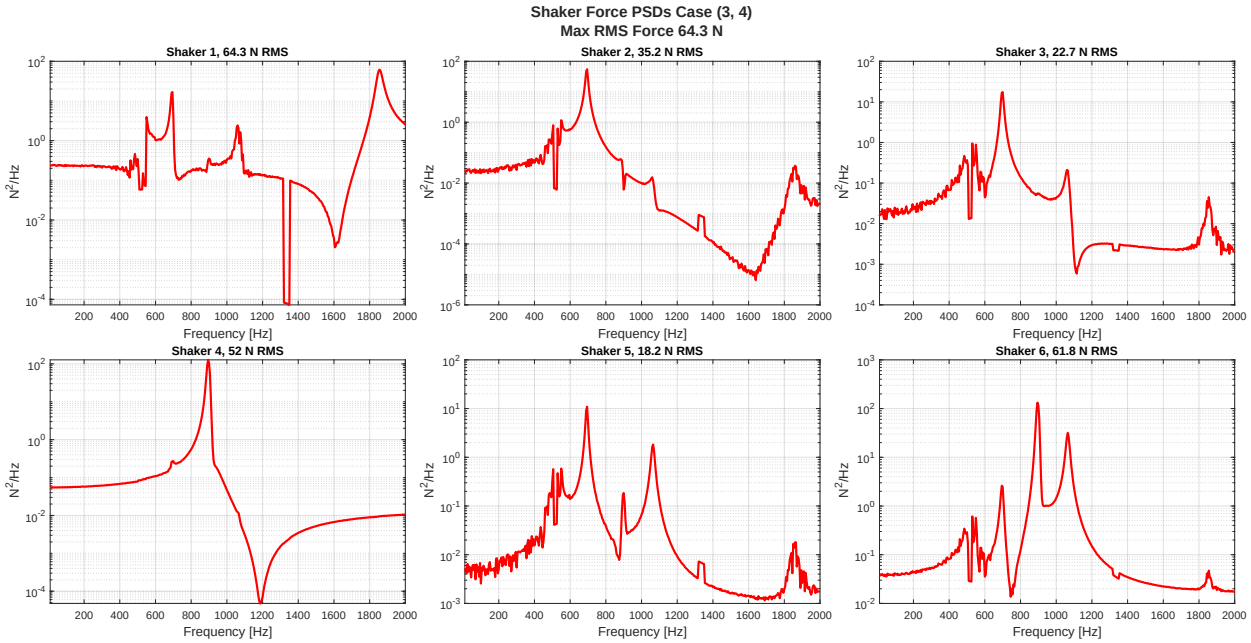


Figure 128: Shaker Forces, Noise, with CN, Case (3,4)

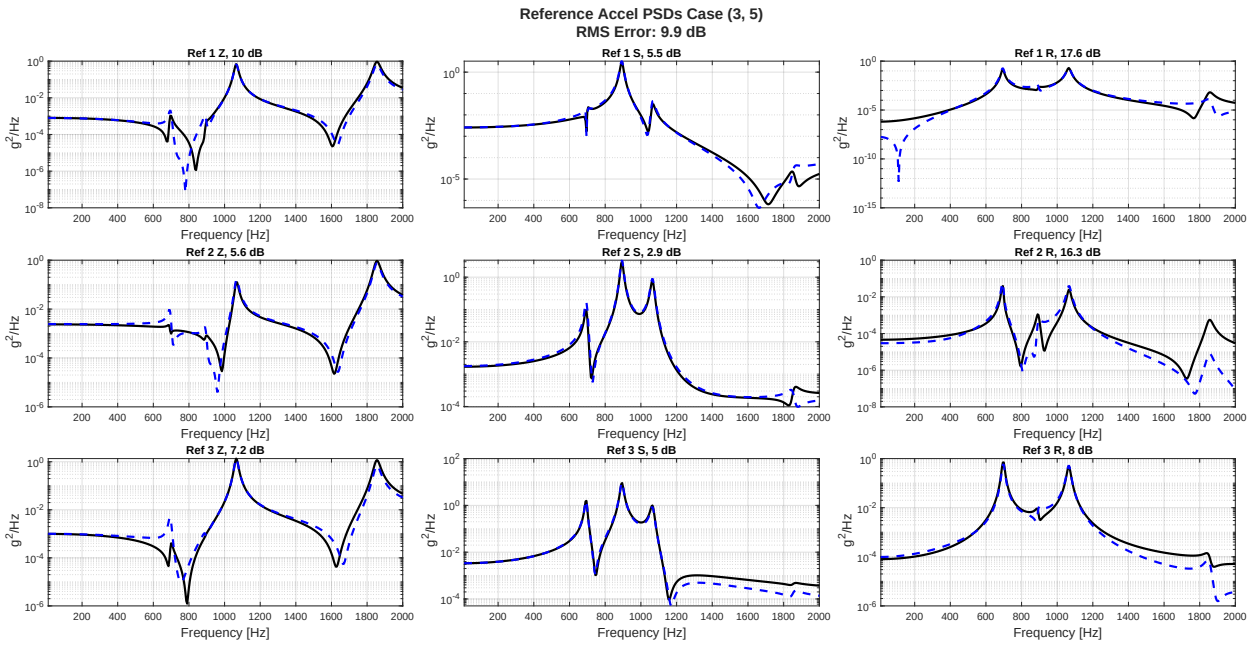


Figure 129: Reference Accels, No Noise, Case (3,5)

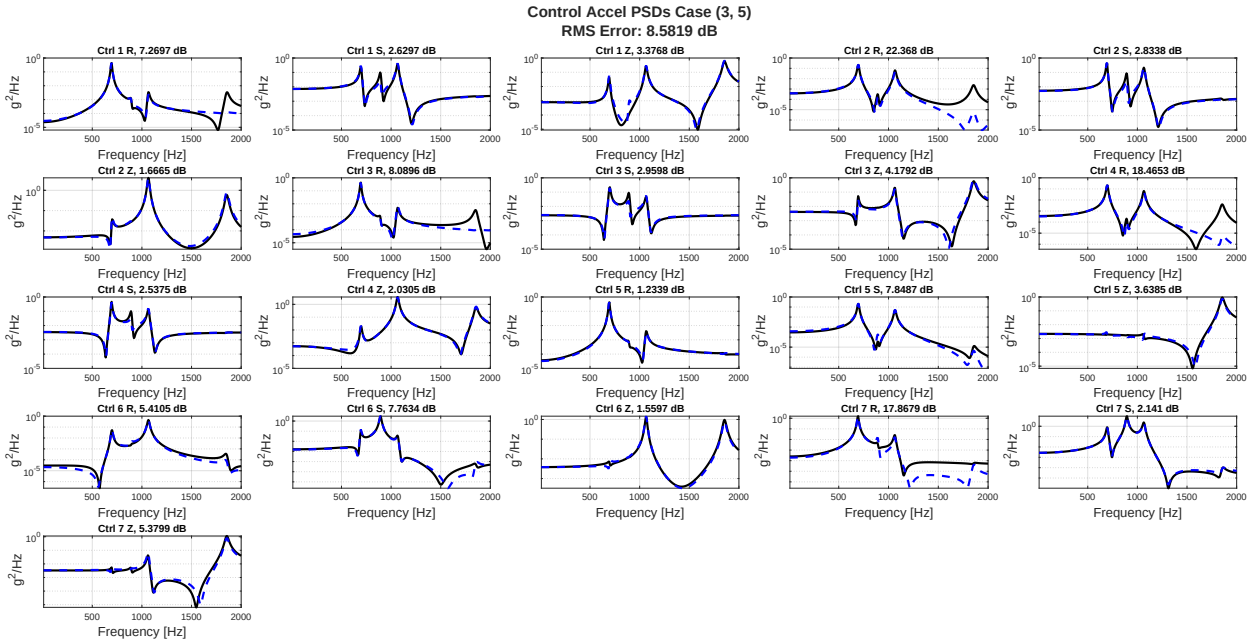


Figure 130: Control Accels, No Noise, Case (3,5)

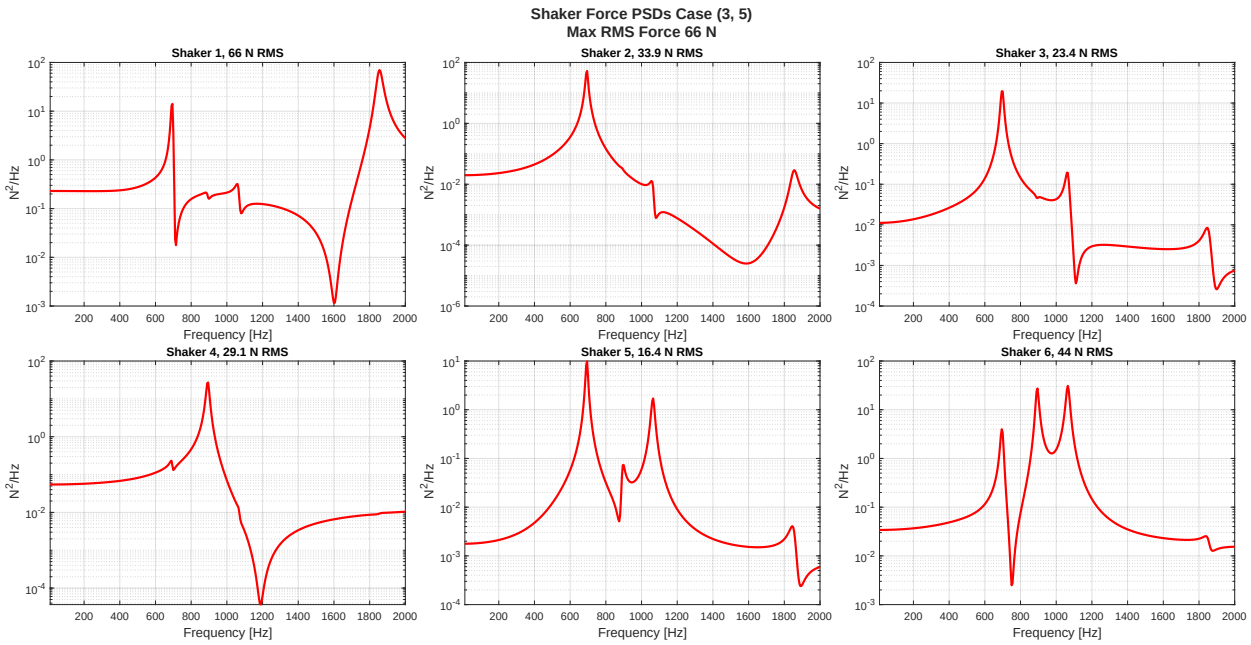


Figure 131: Shaker Forces, No Noise, Case (3,5)

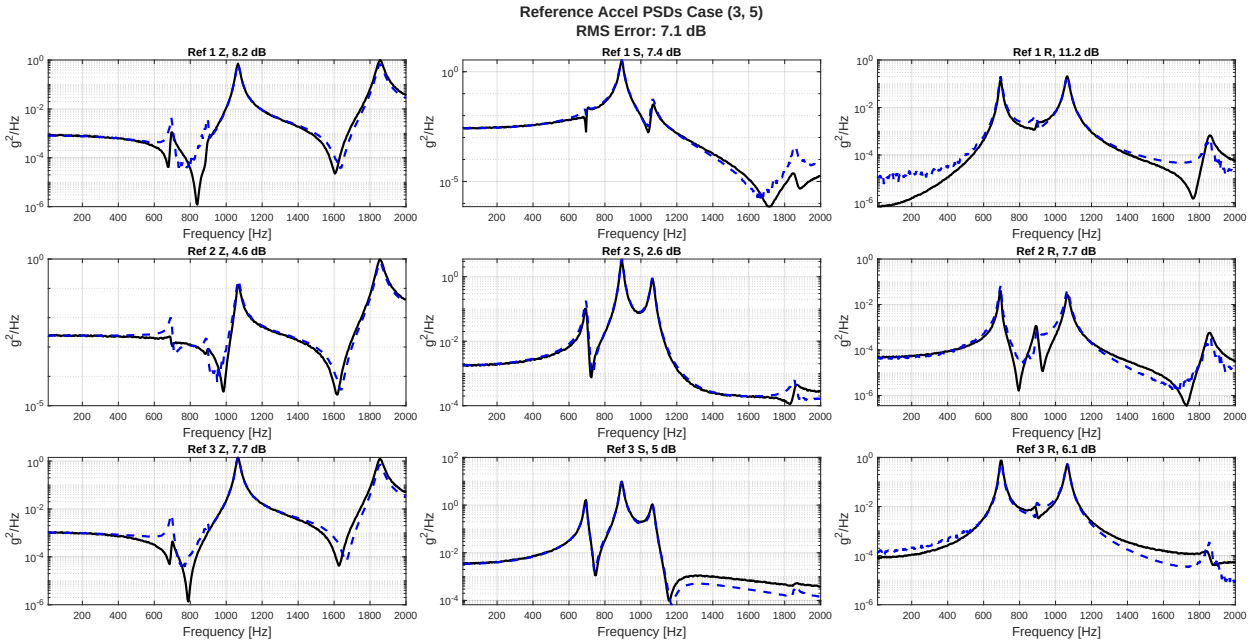


Figure 132: Reference Accels, Noise, No CN, Case (3,5)

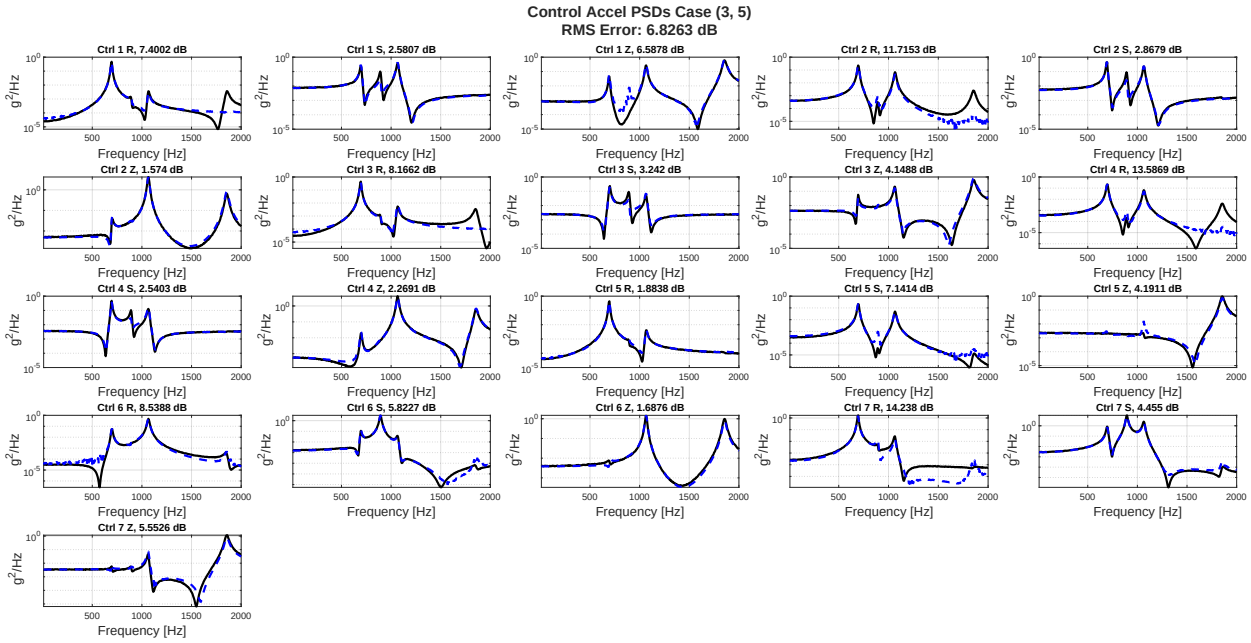


Figure 133: Control Accels, Noise, No CN, Case (3,5)

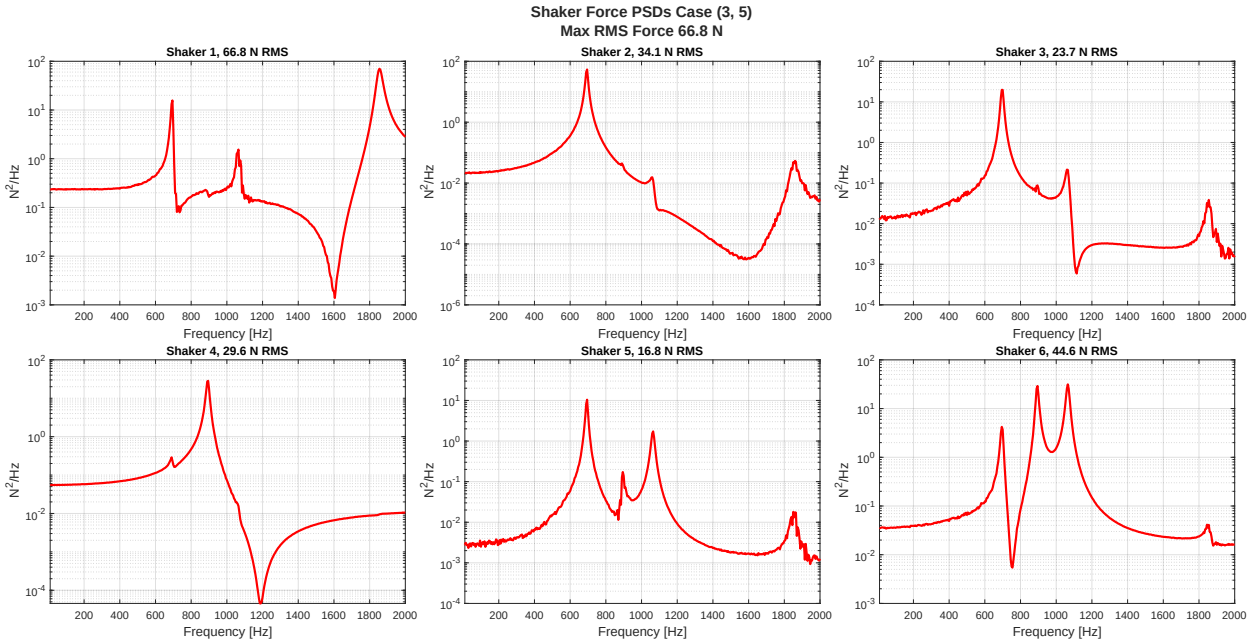


Figure 134: Shaker Forces, Noise, No CN, Case (3,5)

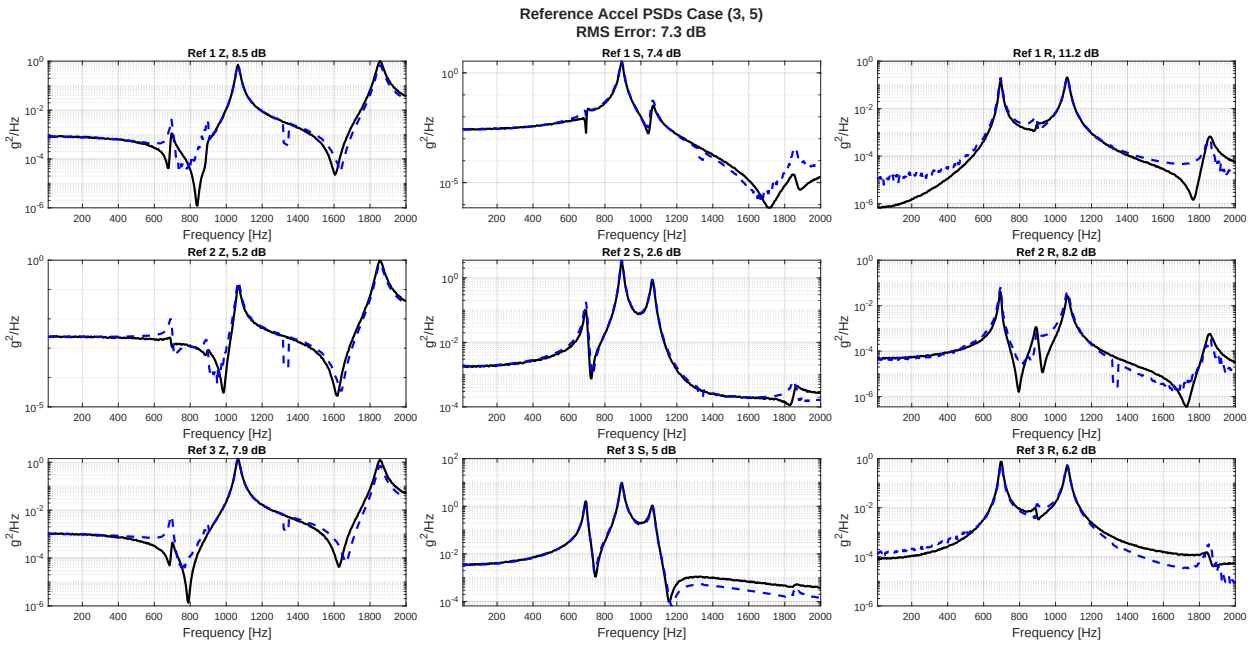


Figure 135: Reference Accels, Noise, with CN, Case (3,5)

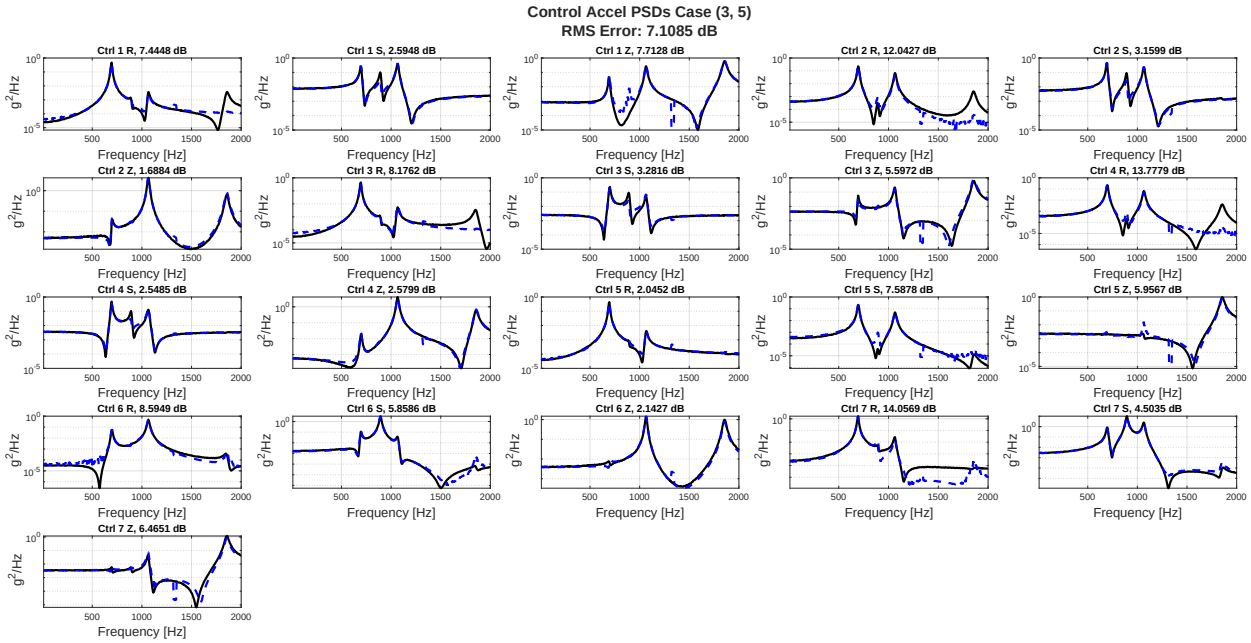


Figure 136: Control Accels, Noise, with CN, Case (3,5)

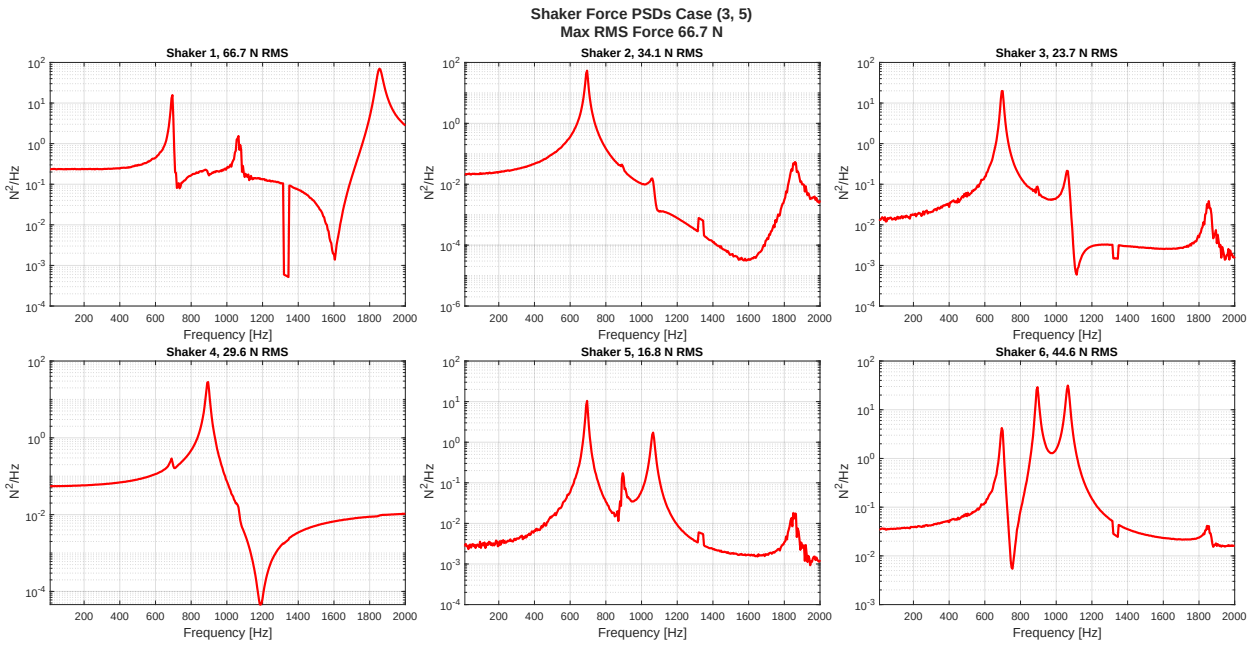


Figure 137: Shaker Forces, Noise, with CN, Case (3,5)

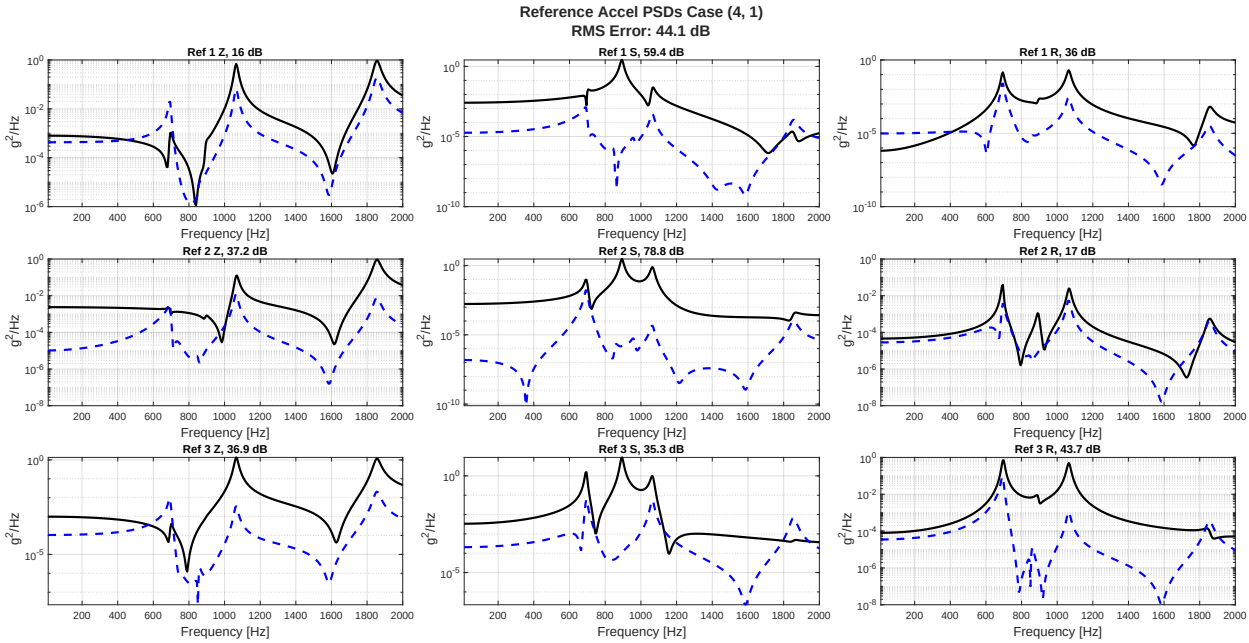


Figure 138: Reference Accels, No Noise, Case (4,1)

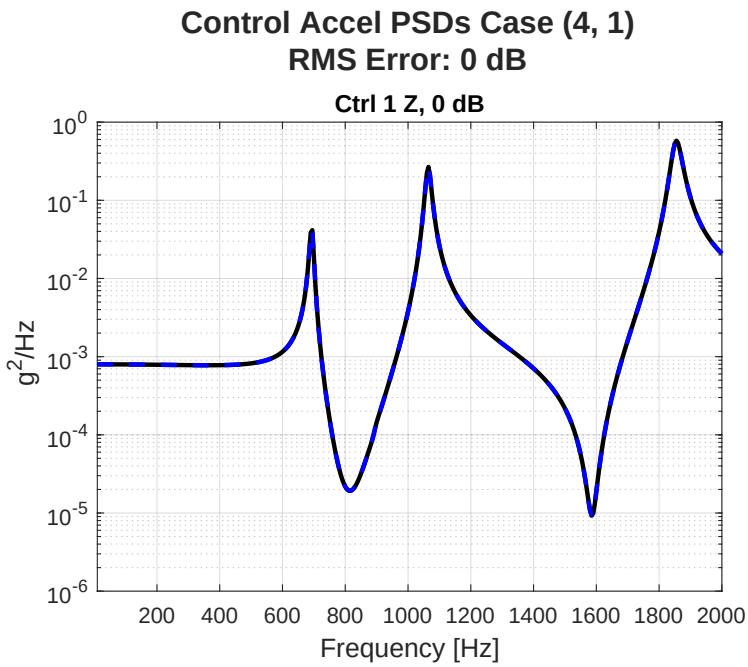


Figure 139: Control Accels, No Noise, Case (4,1)

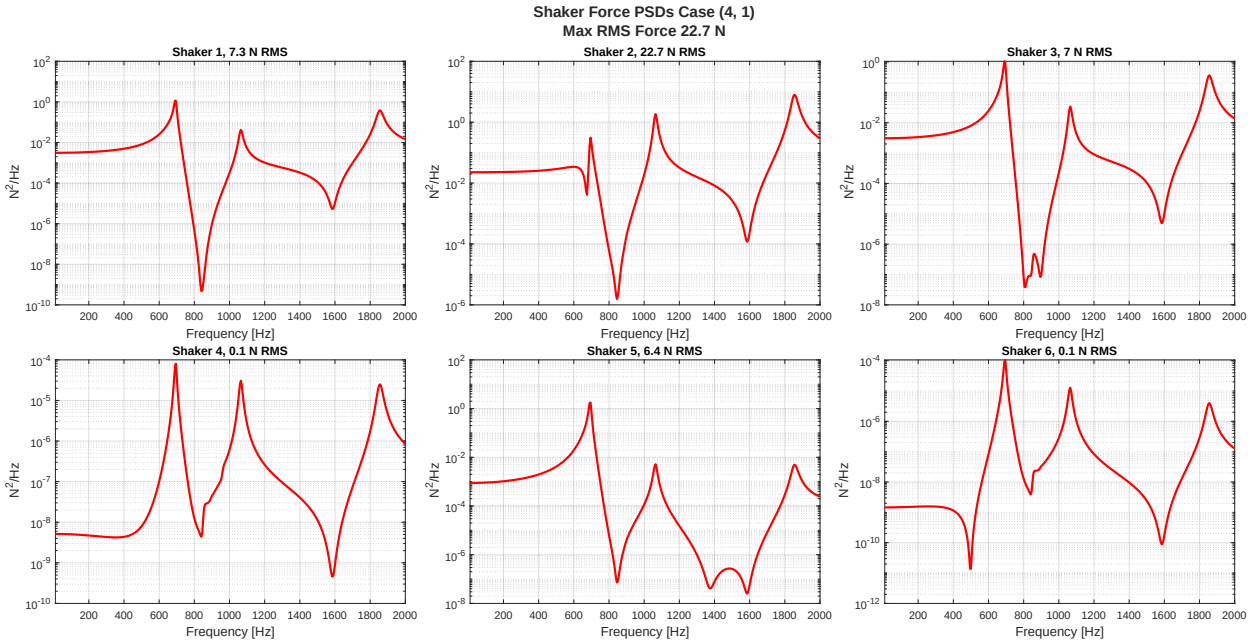


Figure 140: Shaker Forces, No Noise, Case (4,1)

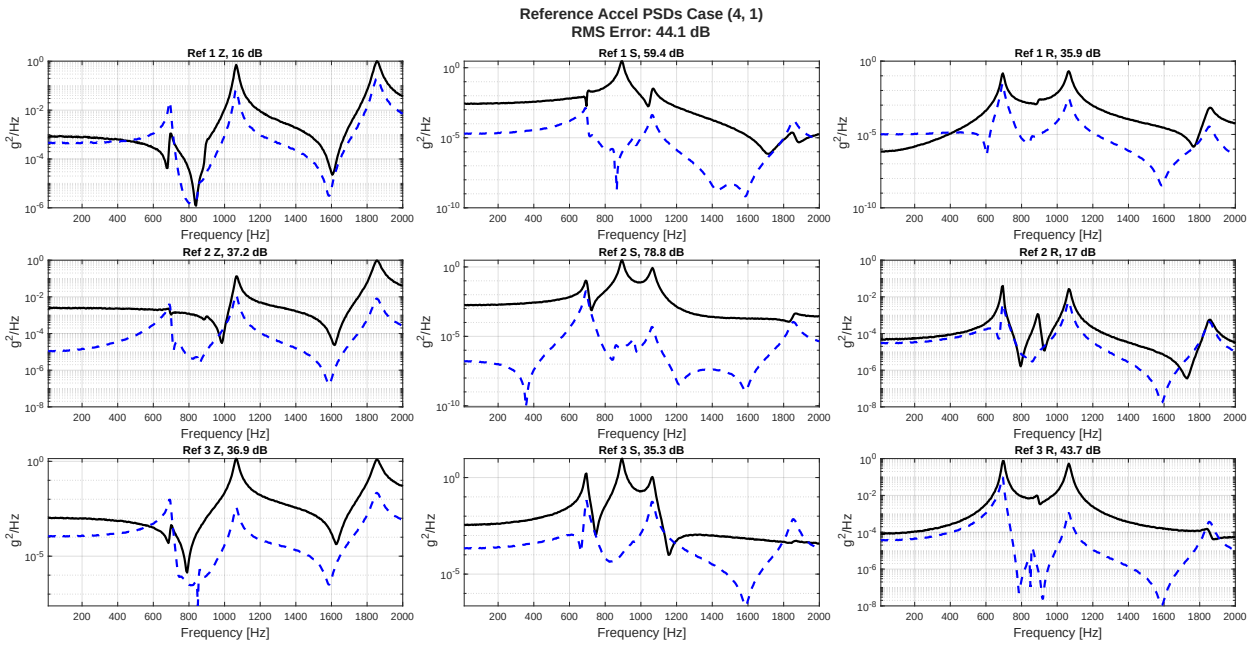


Figure 141: Reference Accels, Noise, No CN, Case (4,1)

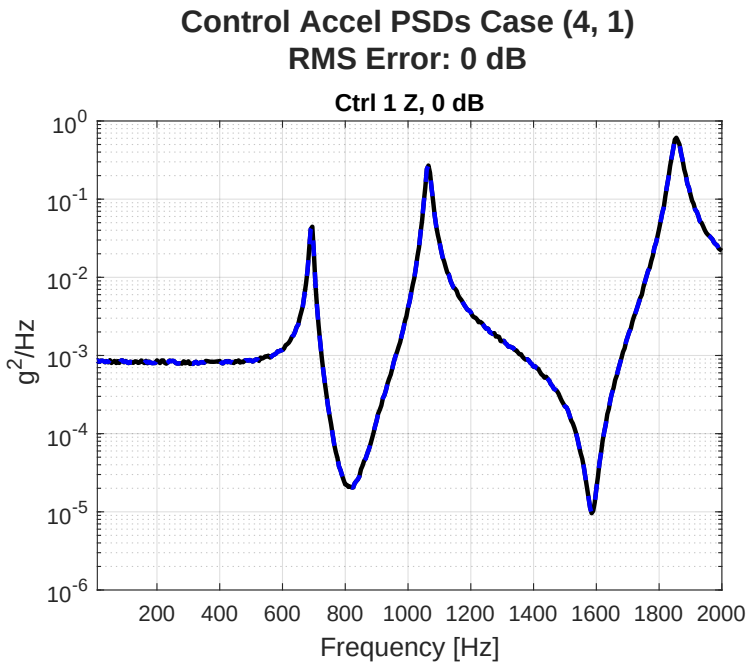


Figure 142: Control Accels, Noise, No CN, Case (4,1)

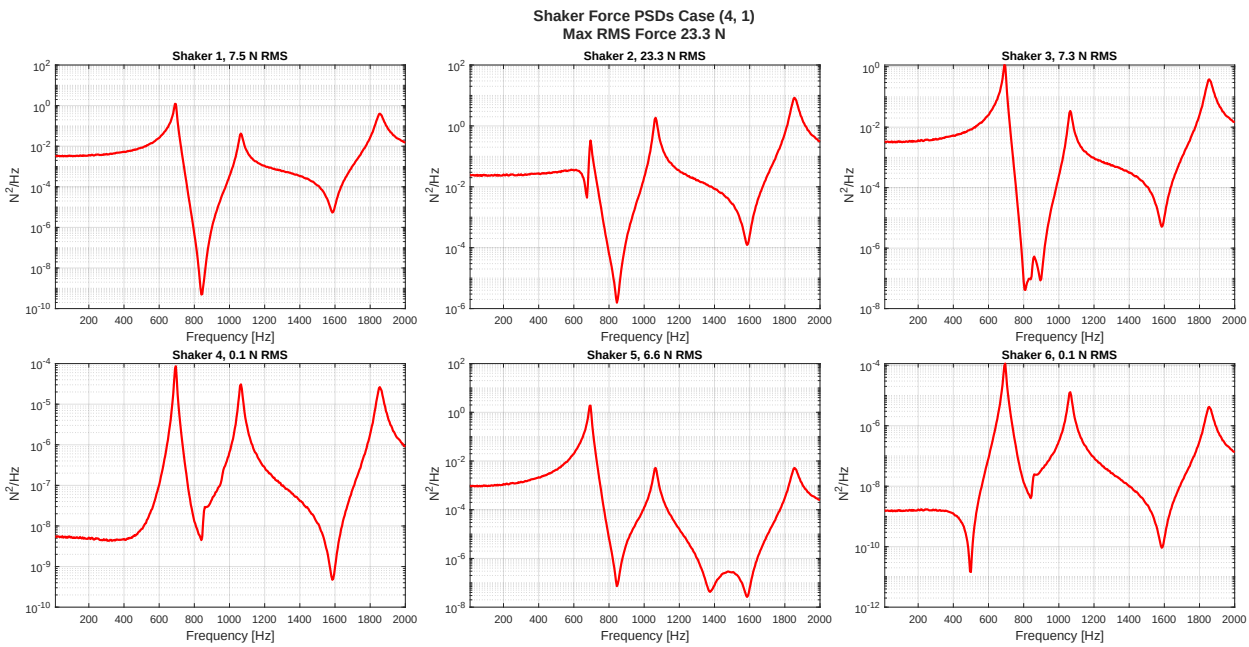


Figure 143: Shaker Forces, Noise, No CN, Case (4,1)

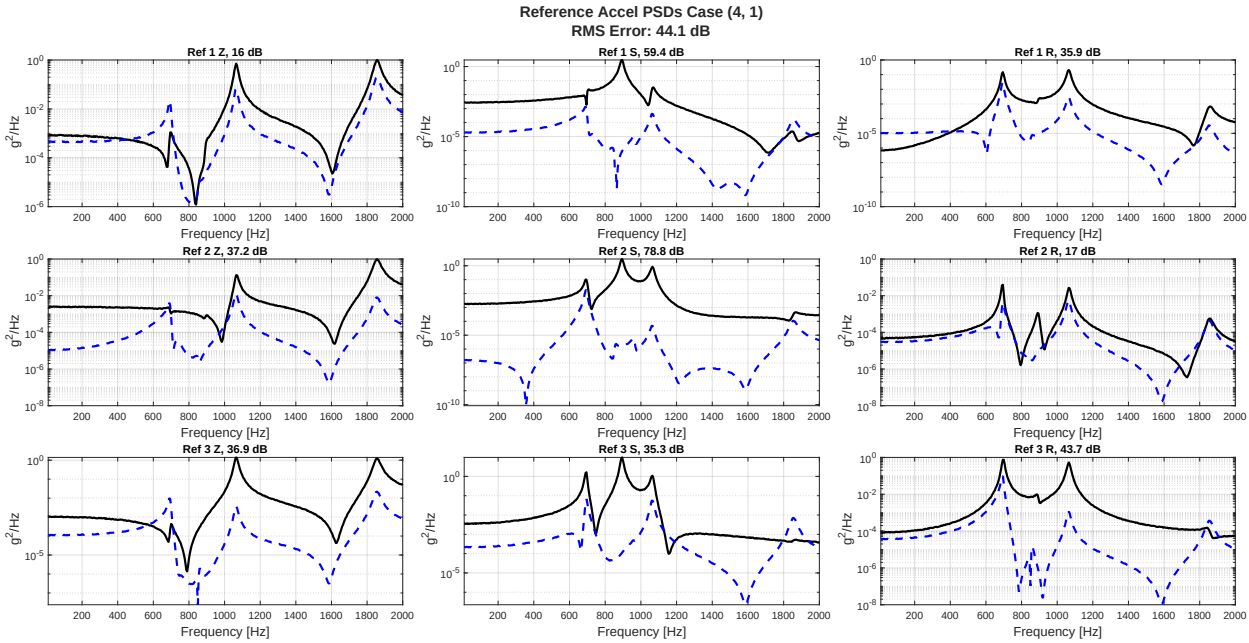


Figure 144: Reference Accels, Noise, with CN, Case (4,1)

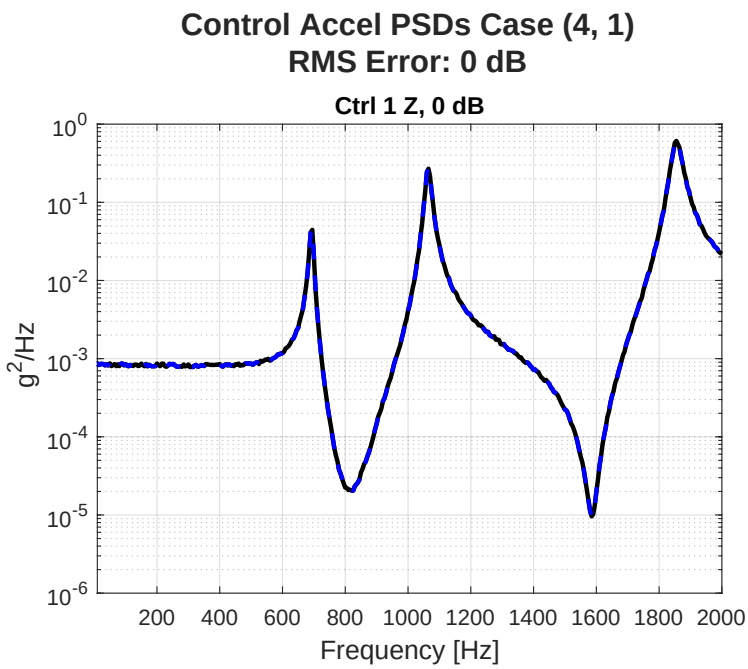


Figure 145: Control Accels, Noise, with CN, Case (4,1)

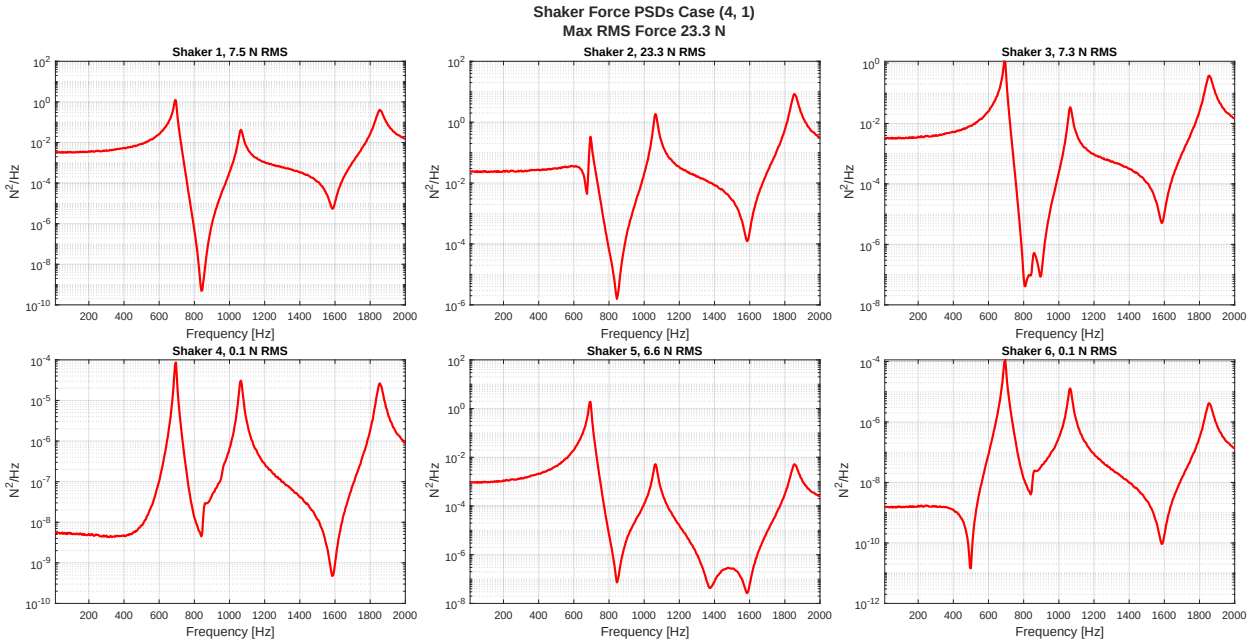


Figure 146: Shaker Forces, Noise, with CN, Case (4,1)

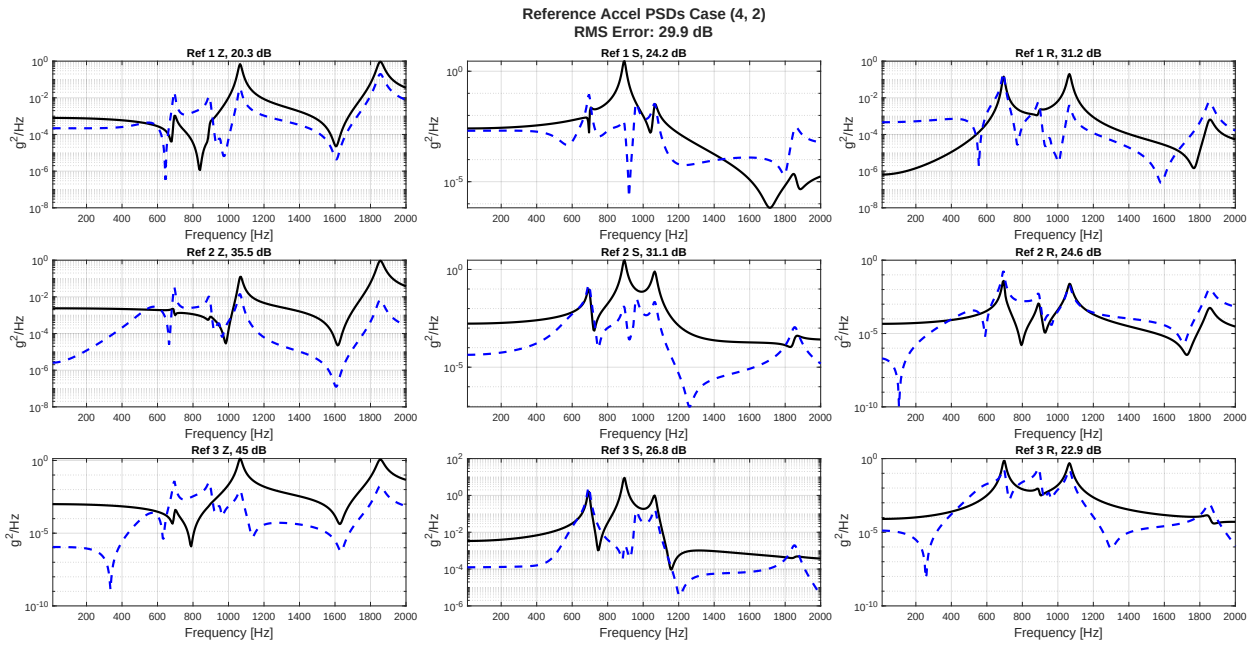


Figure 147: Reference Accels, No Noise, Case (4,2)

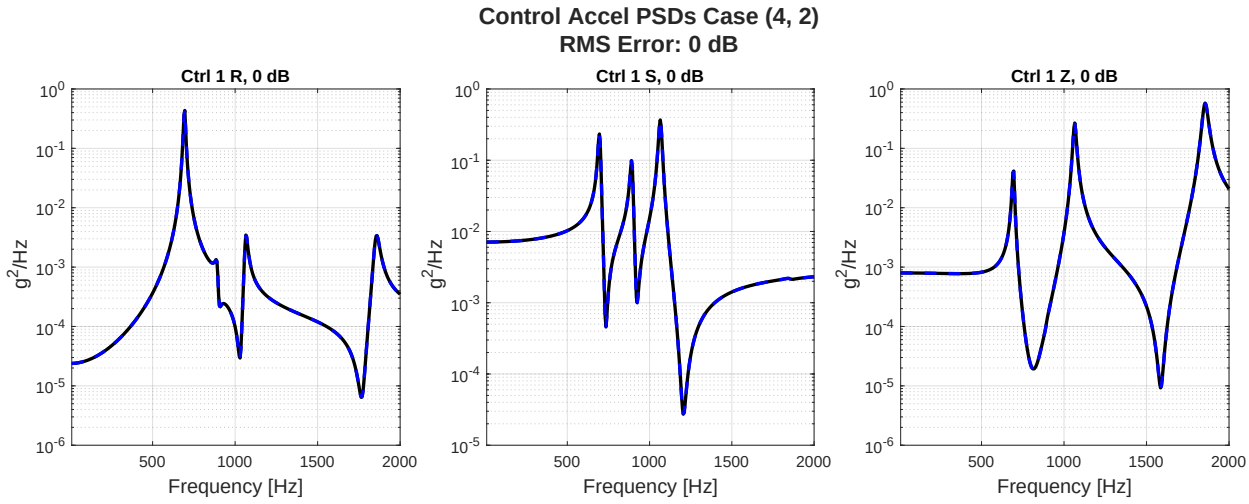


Figure 148: Control Accels, No Noise, Case (4,2)

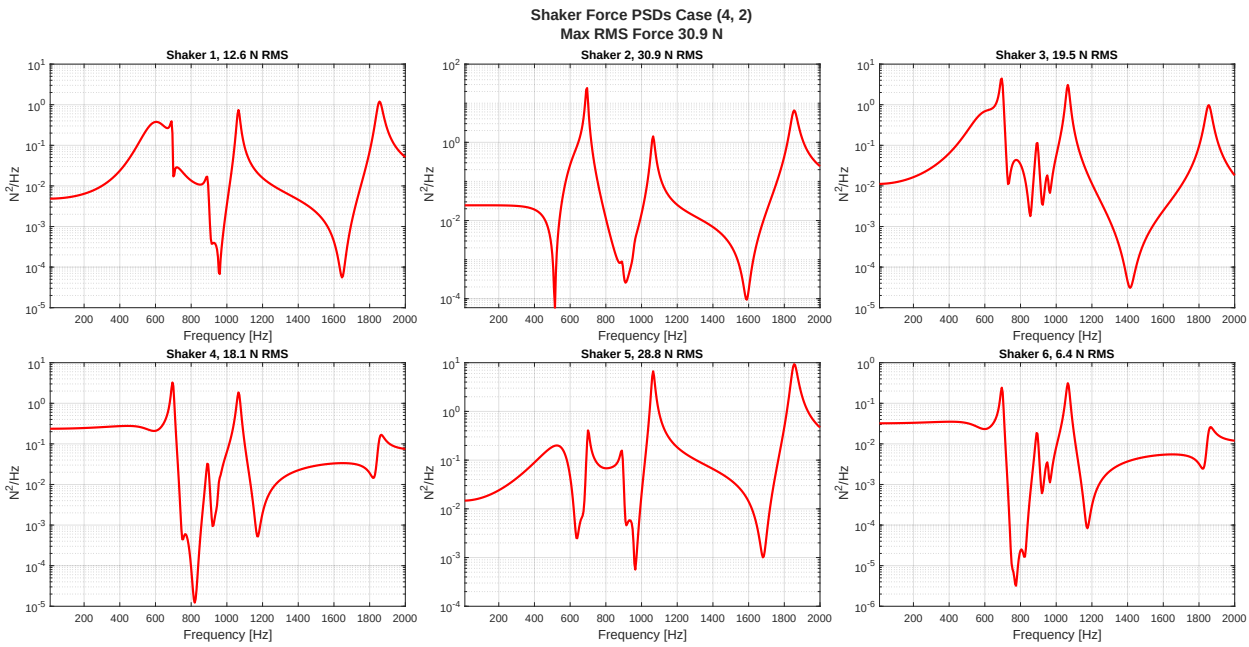


Figure 149: Shaker Forces, No Noise, Case (4,2)

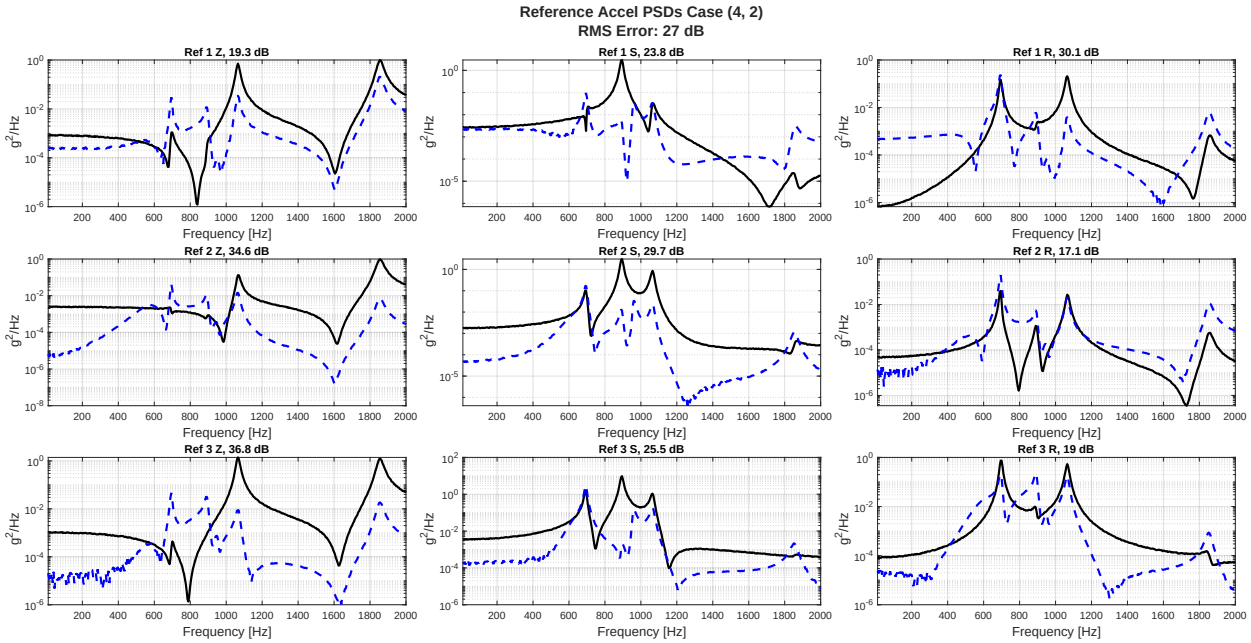


Figure 150: Reference Accels, Noise, No CN, Case (4,2)

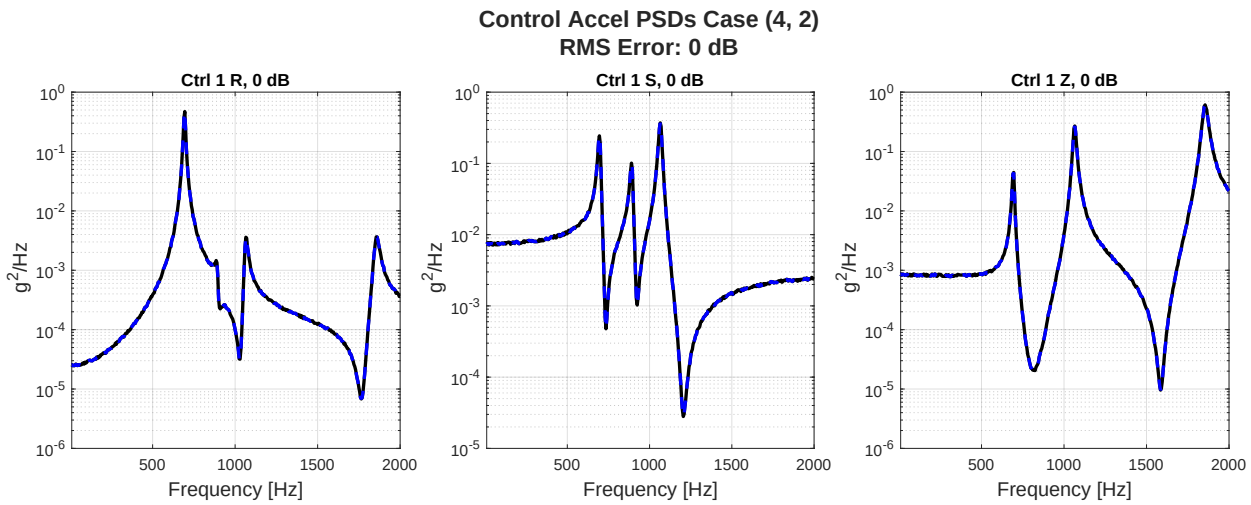


Figure 151: Control Accels, Noise, No CN, Case (4,2)

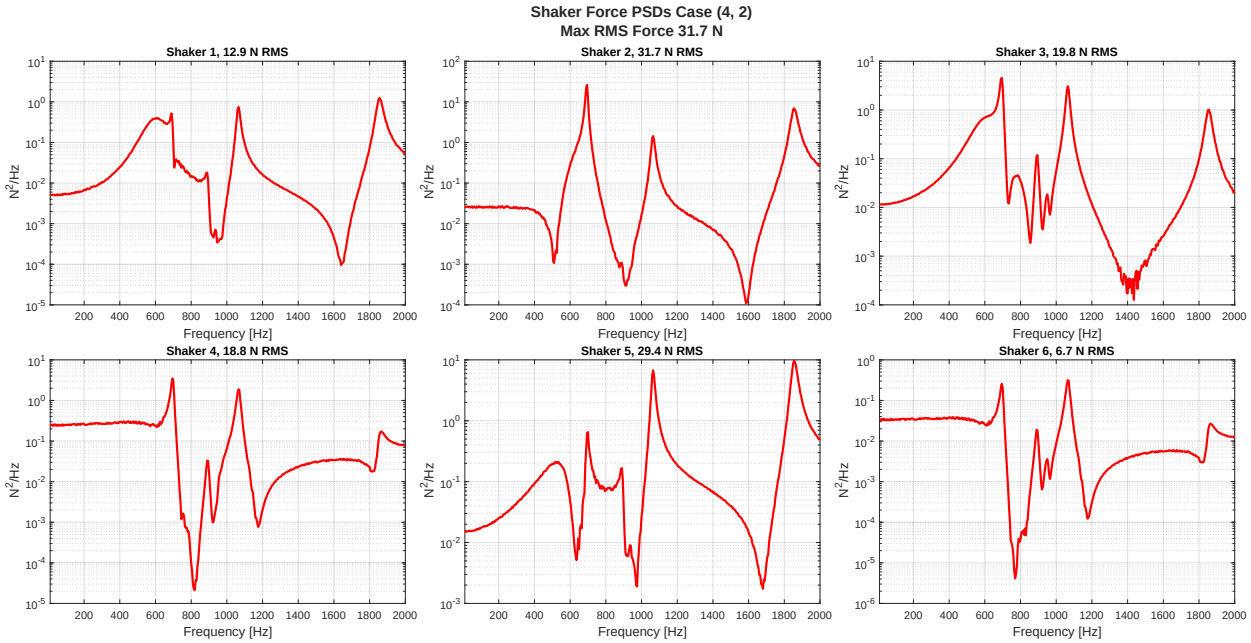


Figure 152: Shaker Forces, Noise, No CN, Case (4,2)

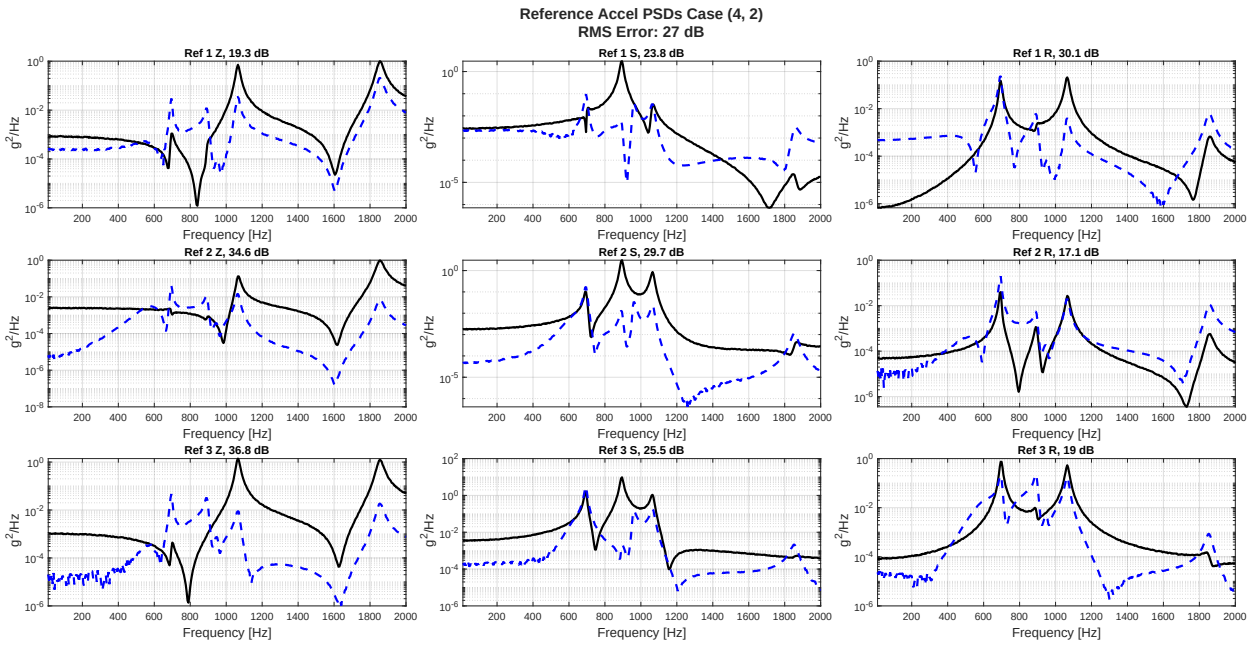


Figure 153: Reference Accels, Noise, with CN, Case (4,2)

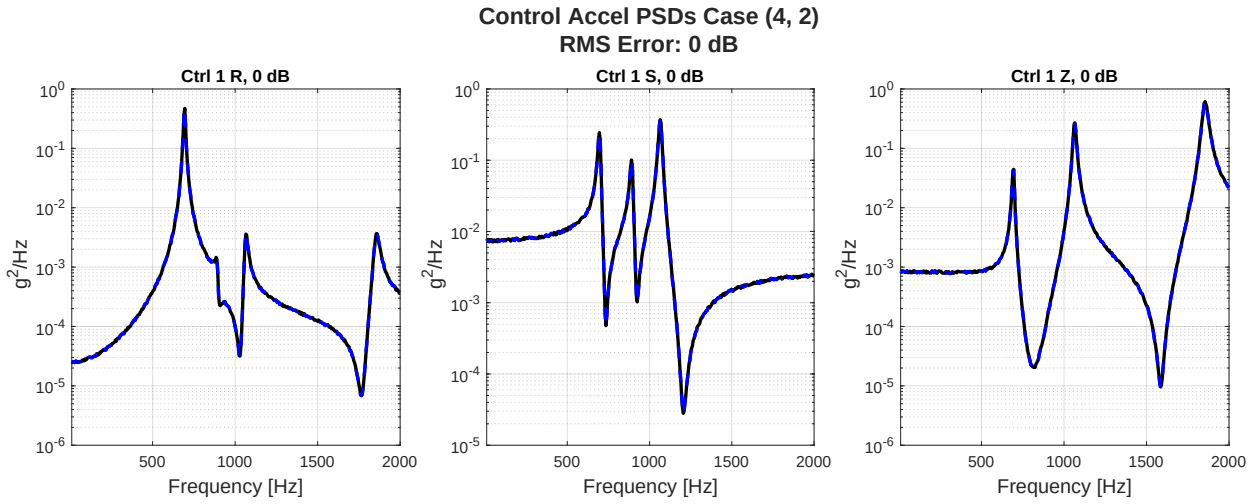


Figure 154: Control Accels, Noise, with CN, Case (4,2)

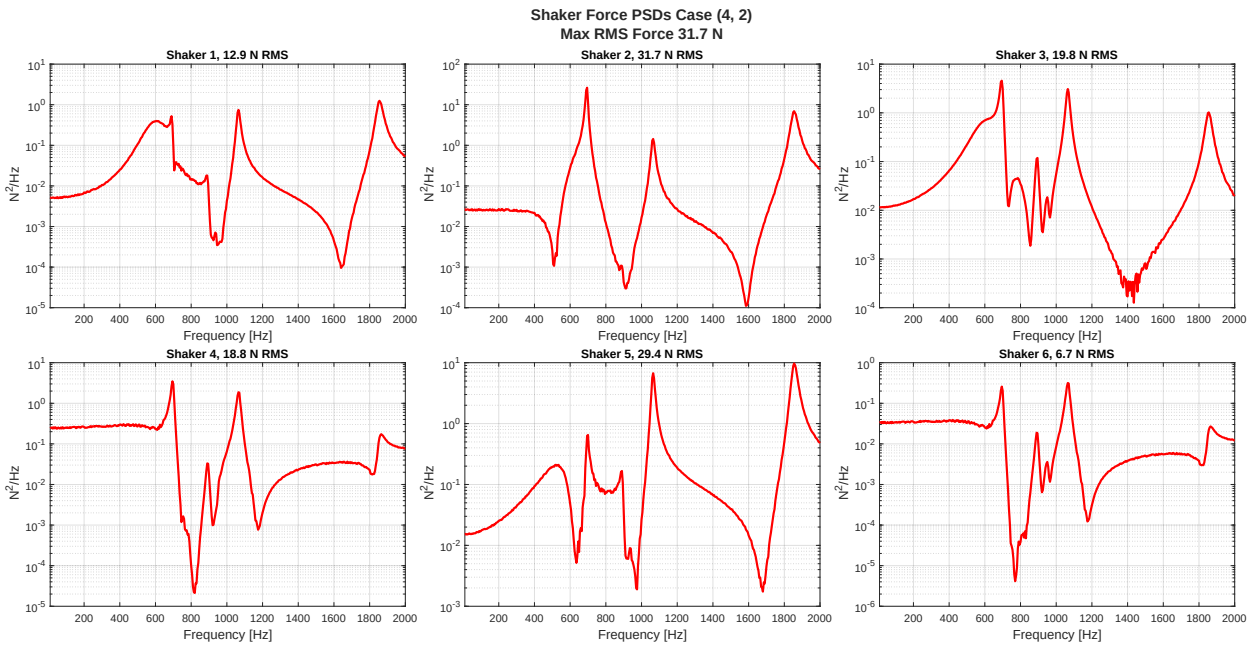


Figure 155: Shaker Forces, Noise, with CN, Case (4,2)

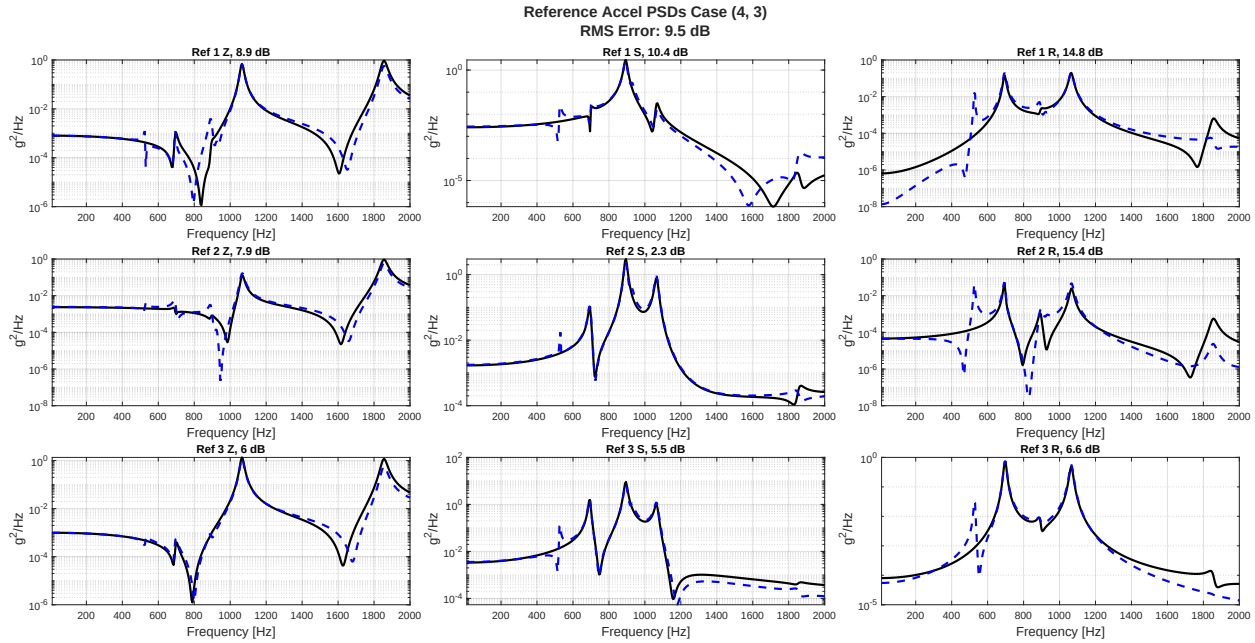


Figure 156: Reference Accels, No Noise, Case (4,3)

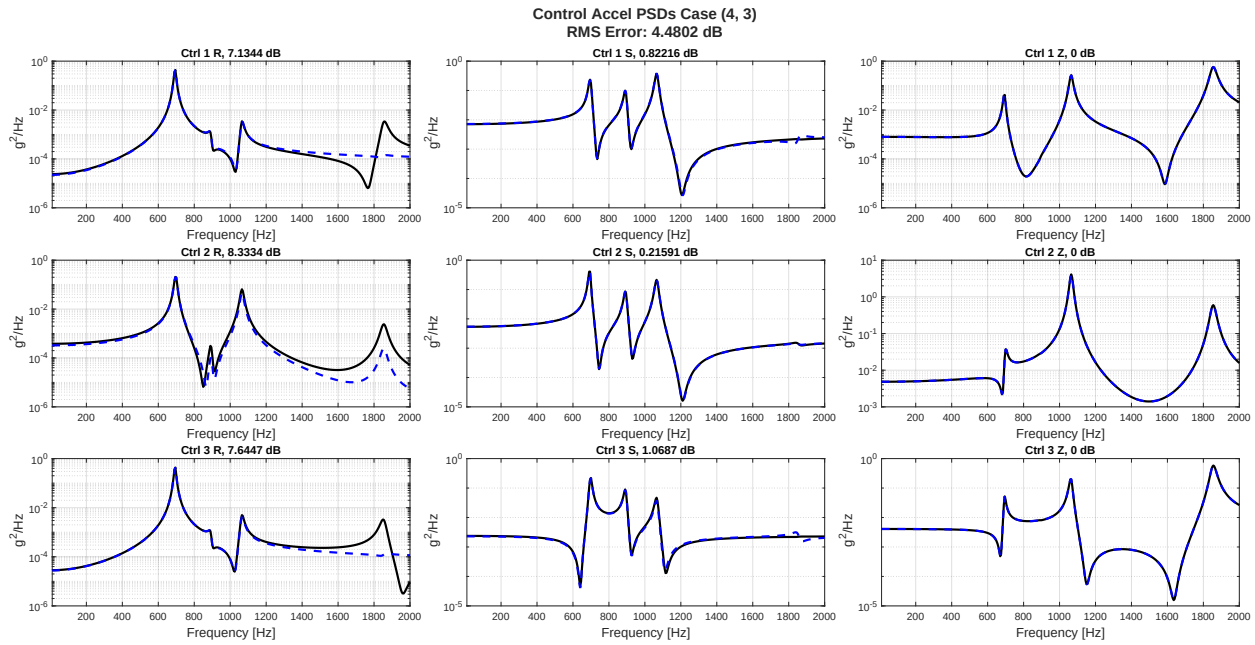


Figure 157: Control Accels, No Noise, Case (4,3)

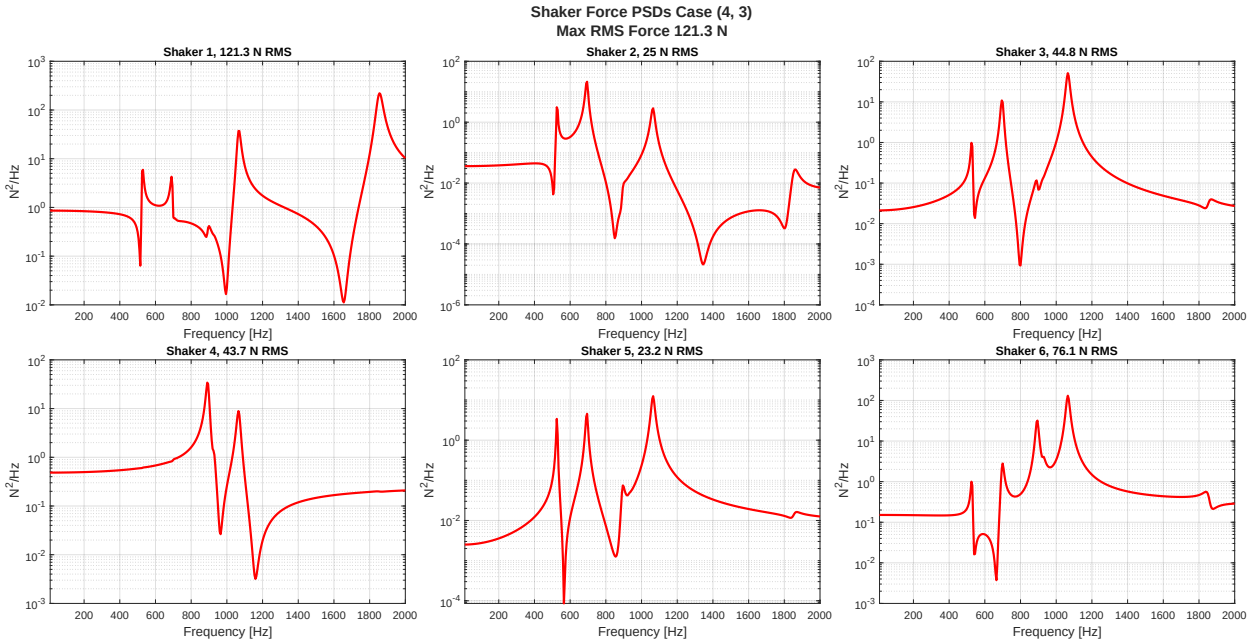


Figure 158: Shaker Forces, No Noise, Case (4,3)

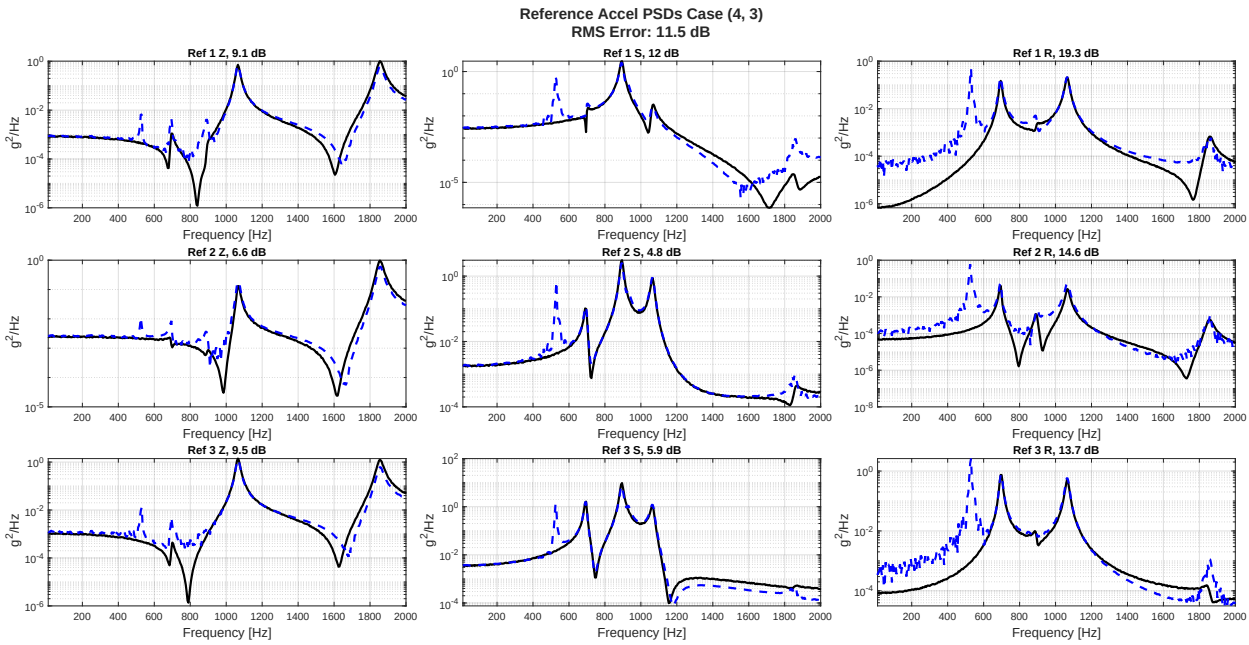


Figure 159: Reference Accels, Noise, No CN, Case (4,3)

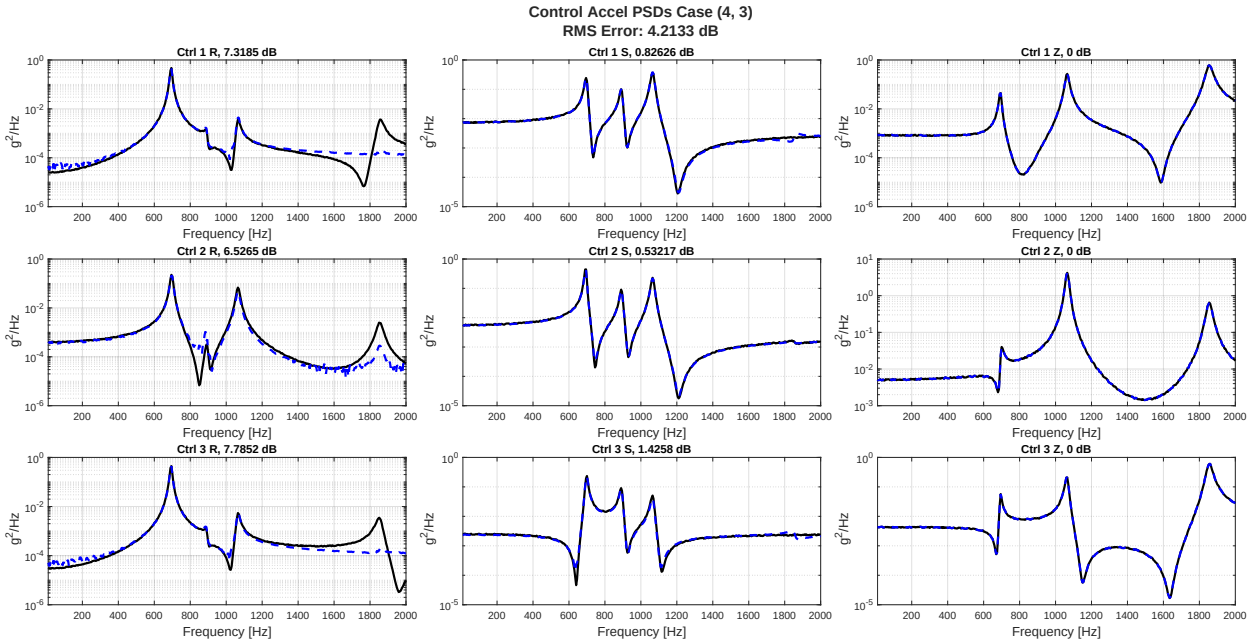


Figure 160: Control Accels, Noise, No CN, Case (4,3)

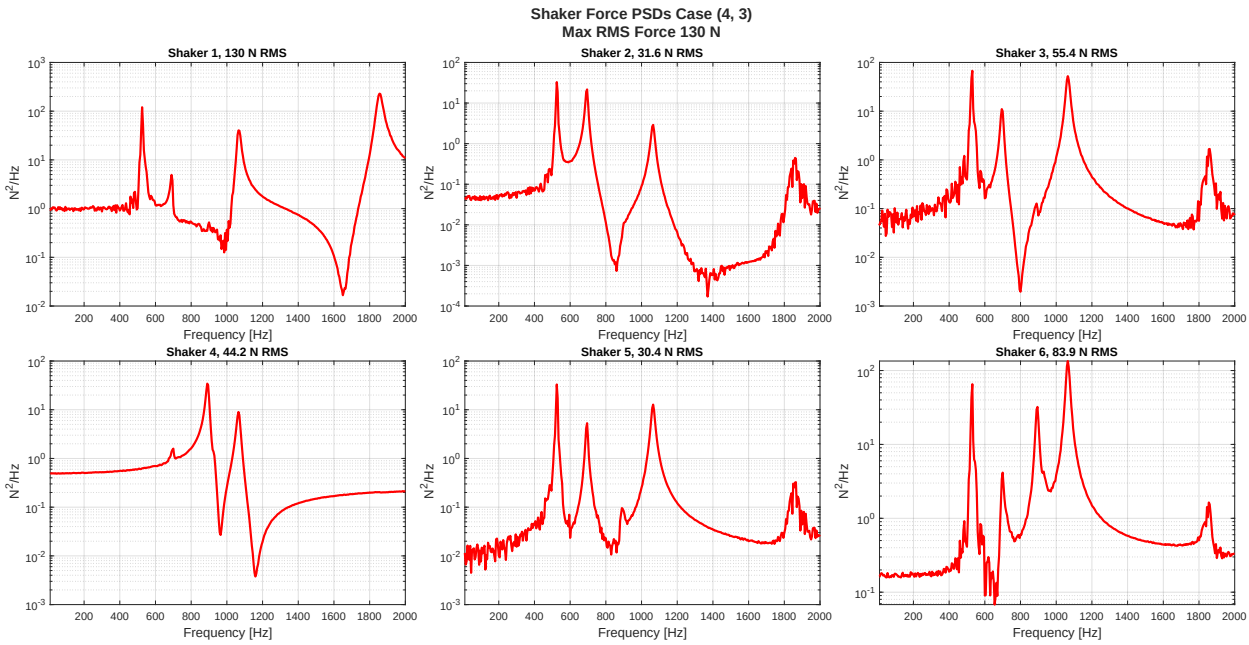


Figure 161: Shaker Forces, Noise, No CN, Case (4,3)

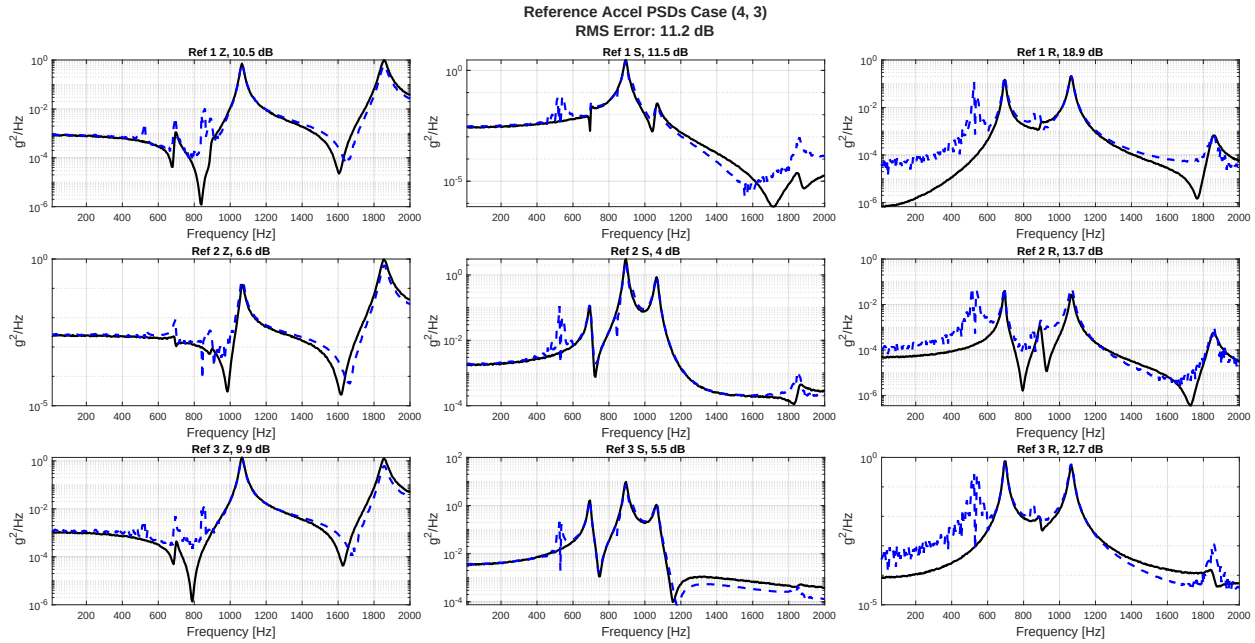


Figure 162: Reference Accels, Noise, with CN, Case (4,3)

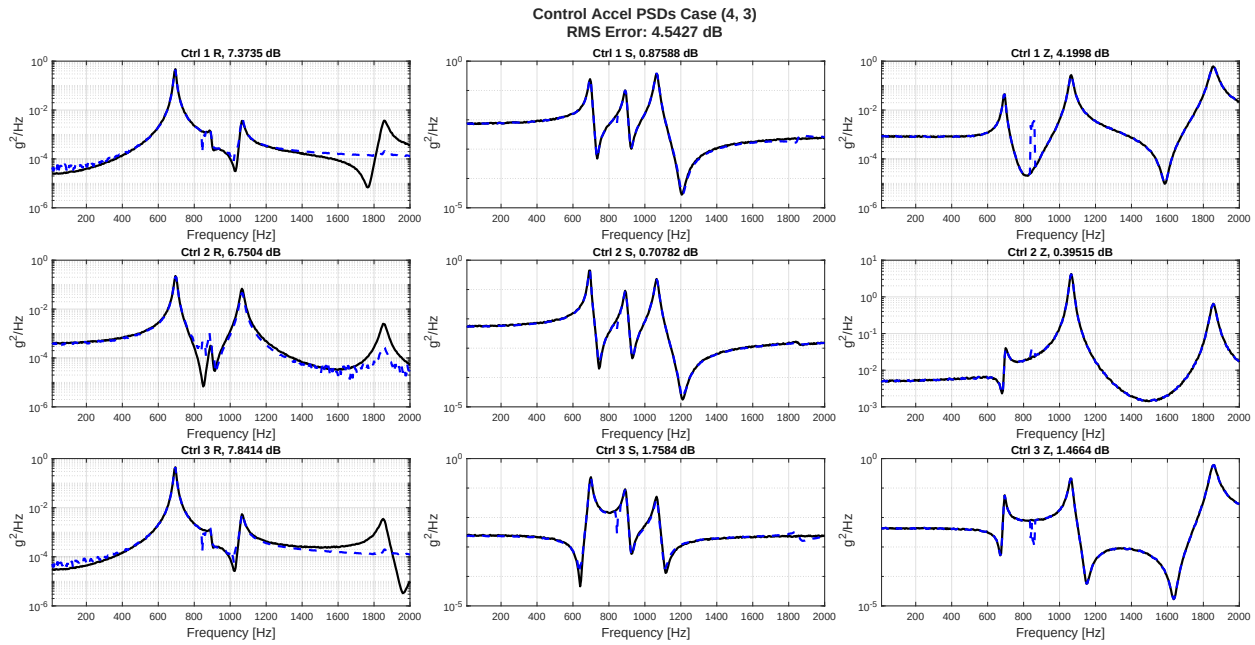


Figure 163: Control Accels, Noise, with CN, Case (4,3)

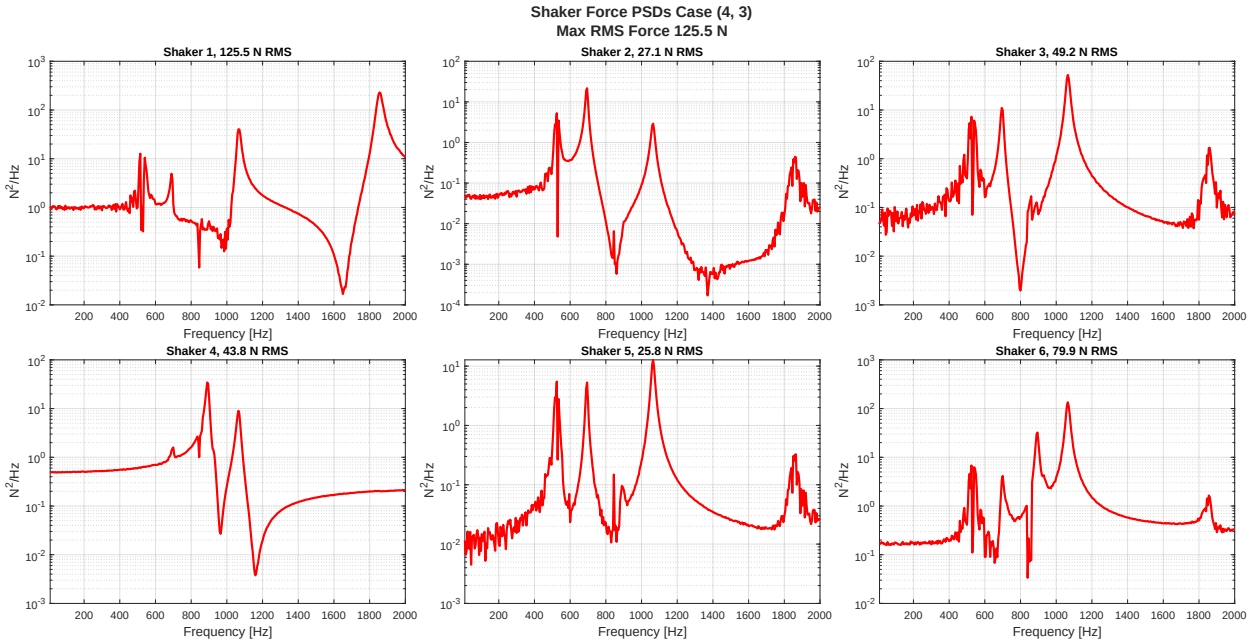


Figure 164: Shaker Forces, Noise, with CN, Case (4,3)

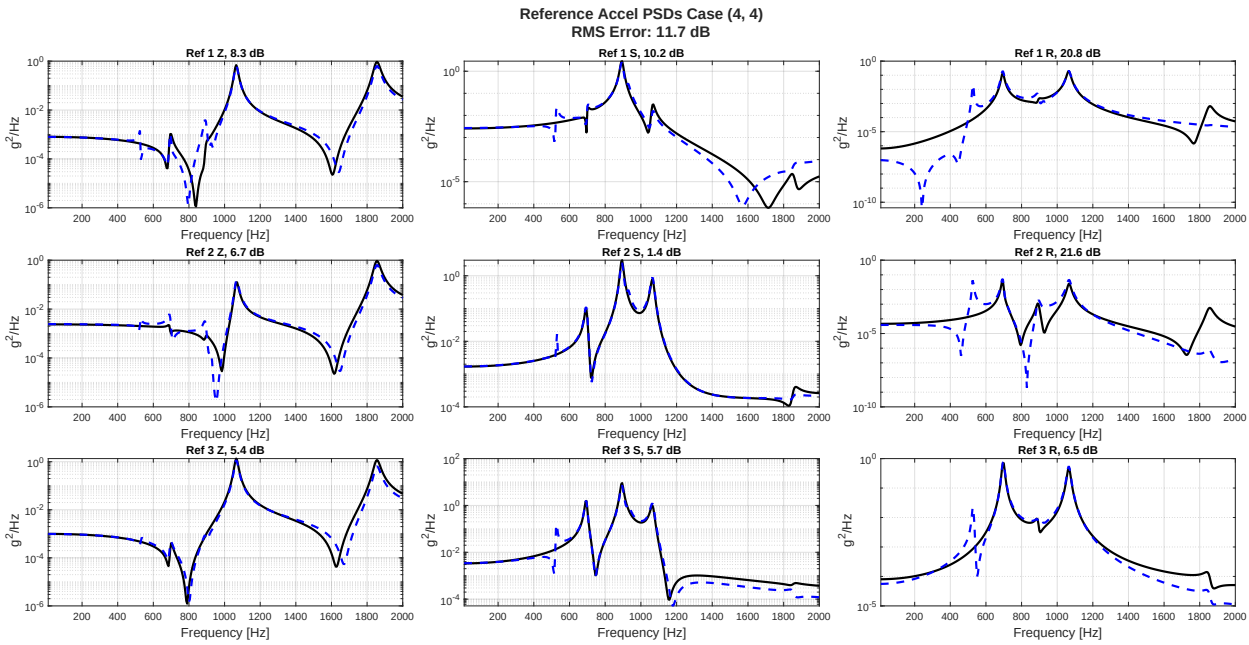


Figure 165: Reference Accels, No Noise, Case (4,4)

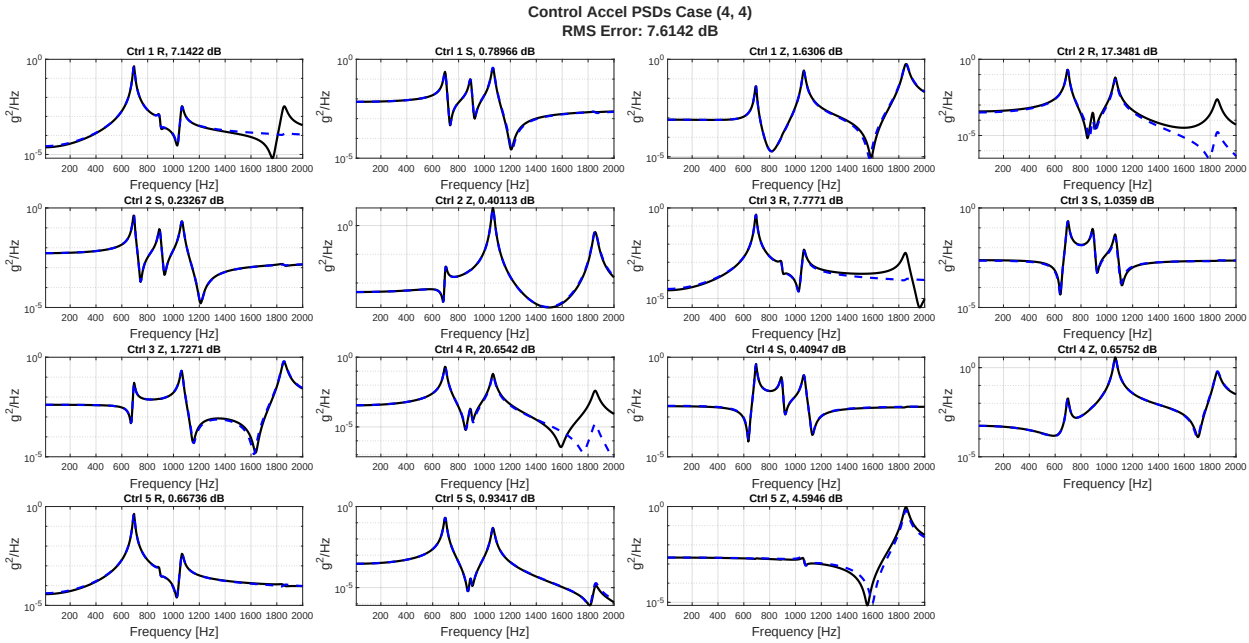


Figure 166: Control Accels, No Noise, Case (4,4)

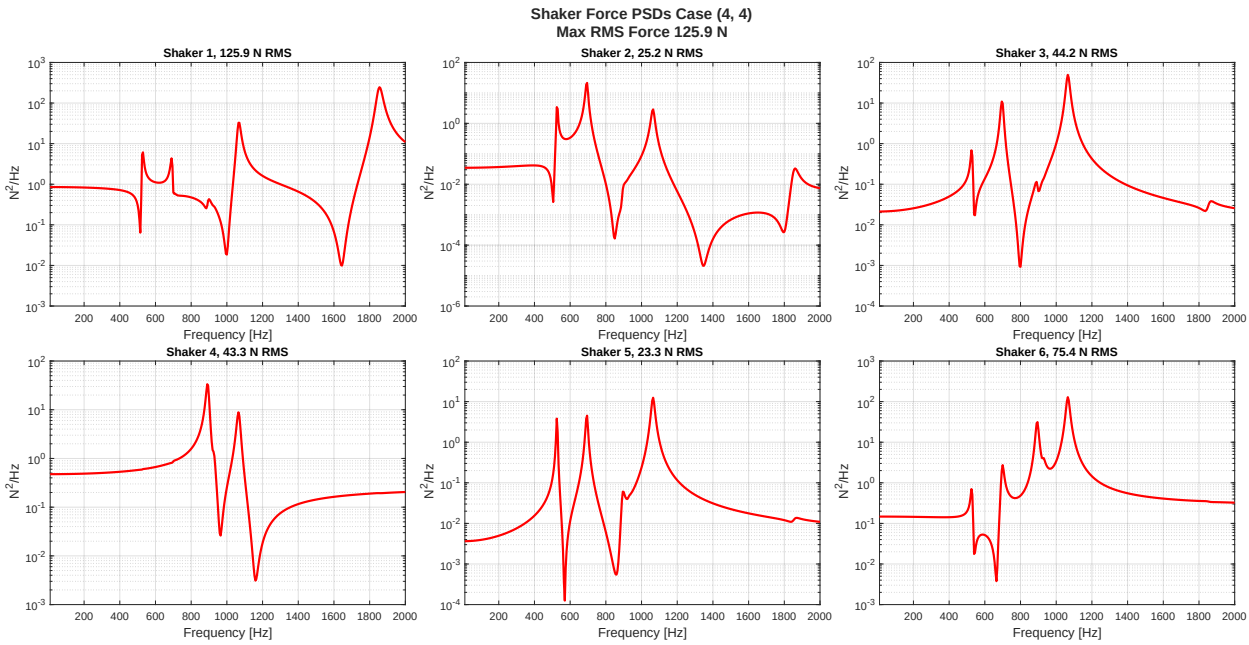


Figure 167: Shaker Forces, No Noise, Case (4,4)

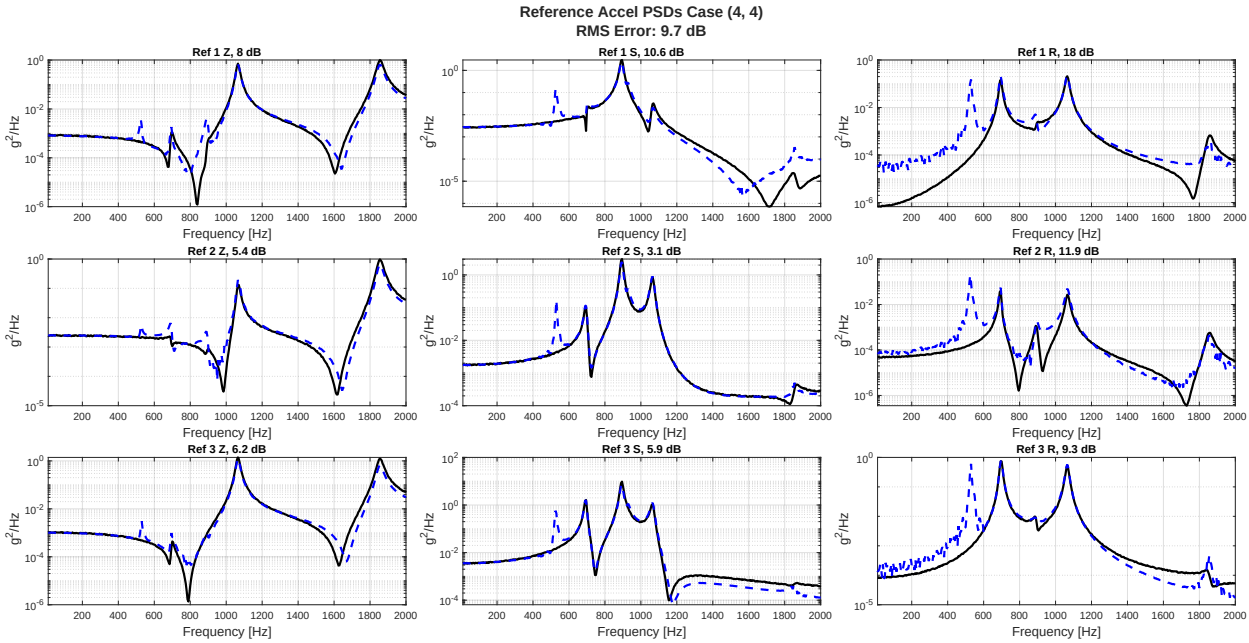


Figure 168: Reference Accels, Noise, No CN, Case (4,4)

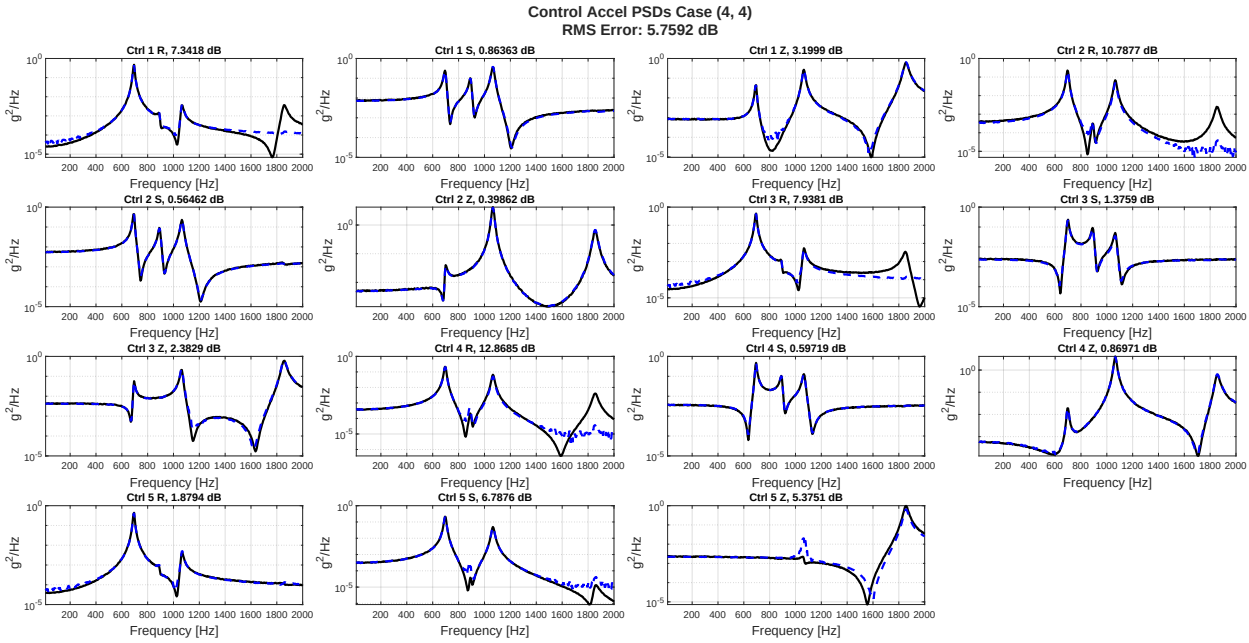


Figure 169: Control Accels, Noise, No CN, Case (4,4)

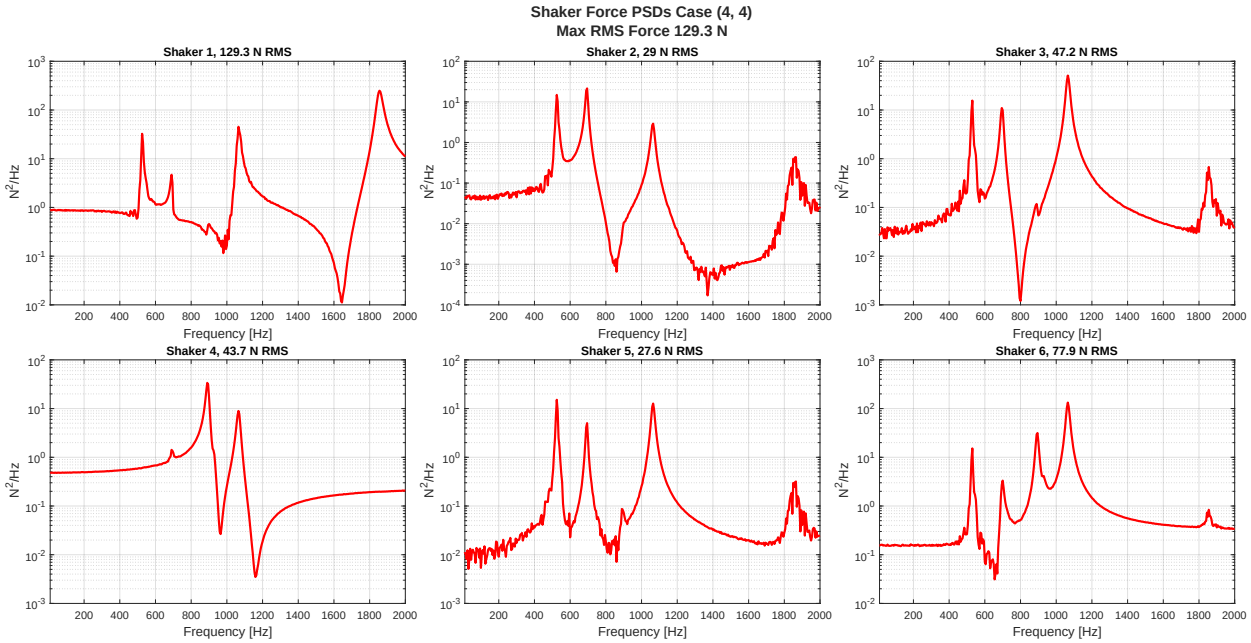


Figure 170: Shaker Forces, Noise, No CN, Case (4,4)

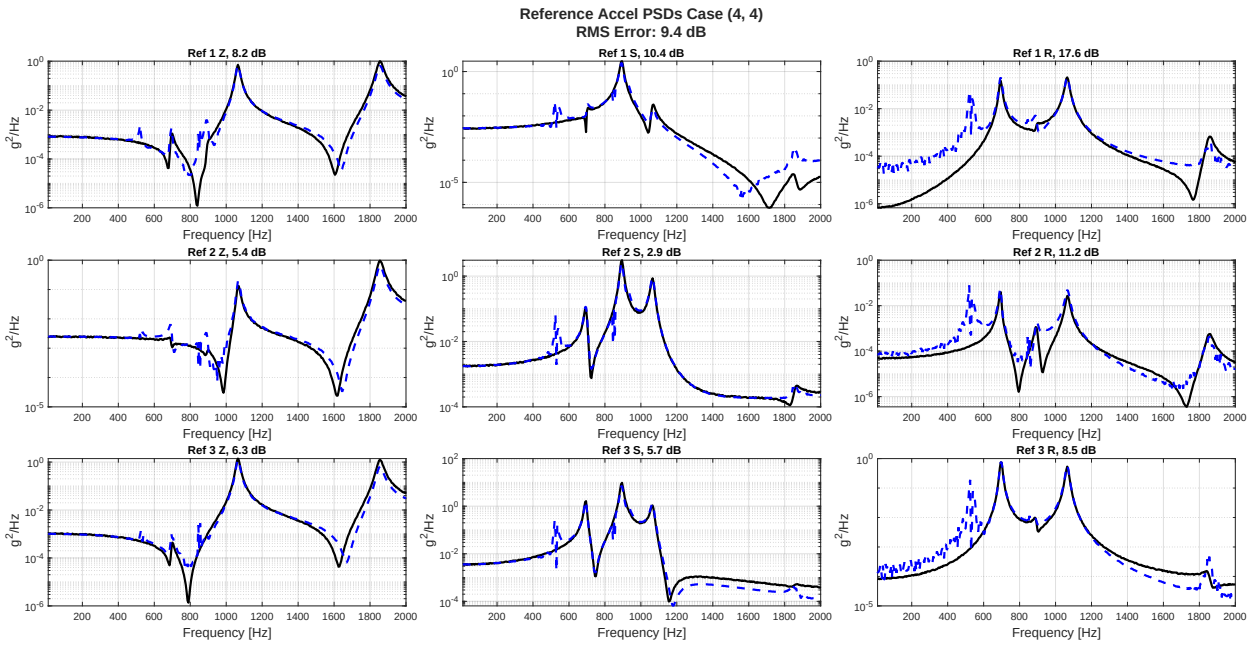


Figure 171: Reference Accels, Noise, with CN, Case (4,4)

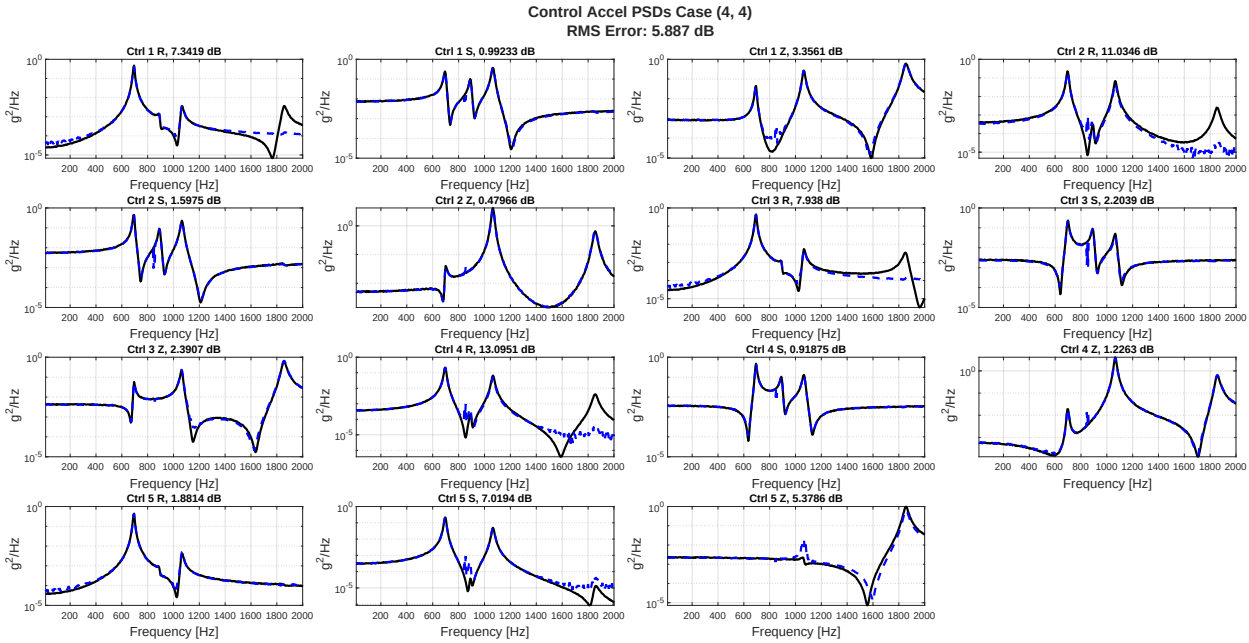


Figure 172: Control Accels, Noise, with CN, Case (4,4)

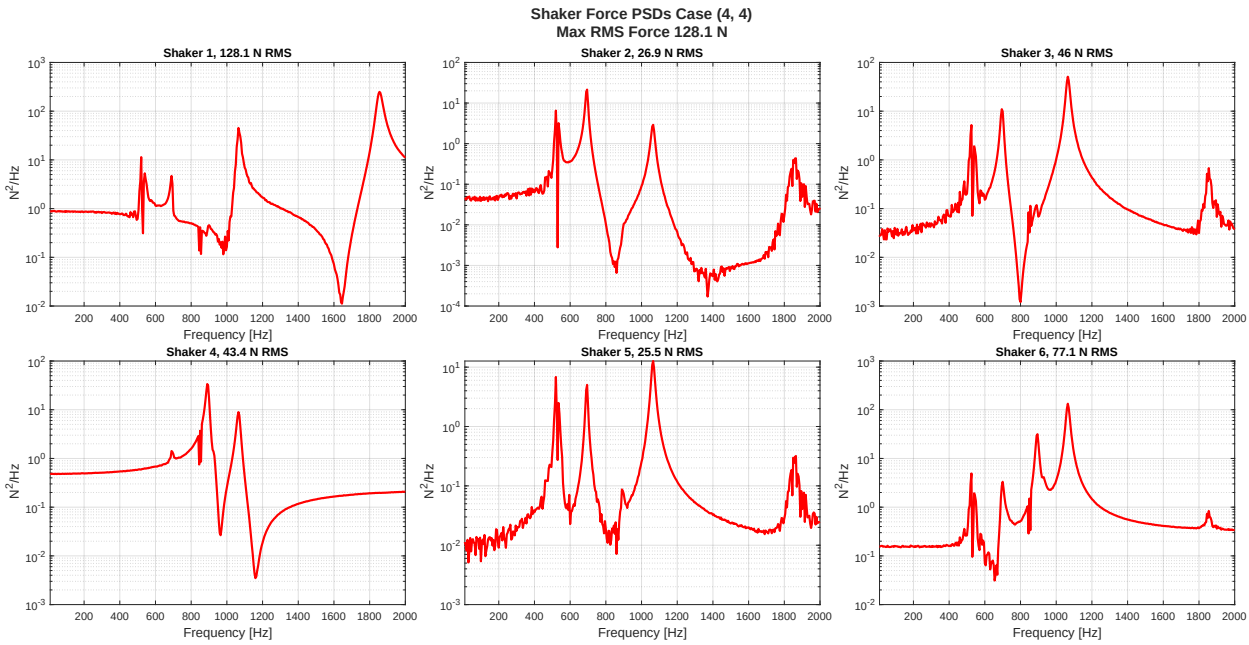


Figure 173: Shaker Forces, Noise, with CN, Case (4,4)

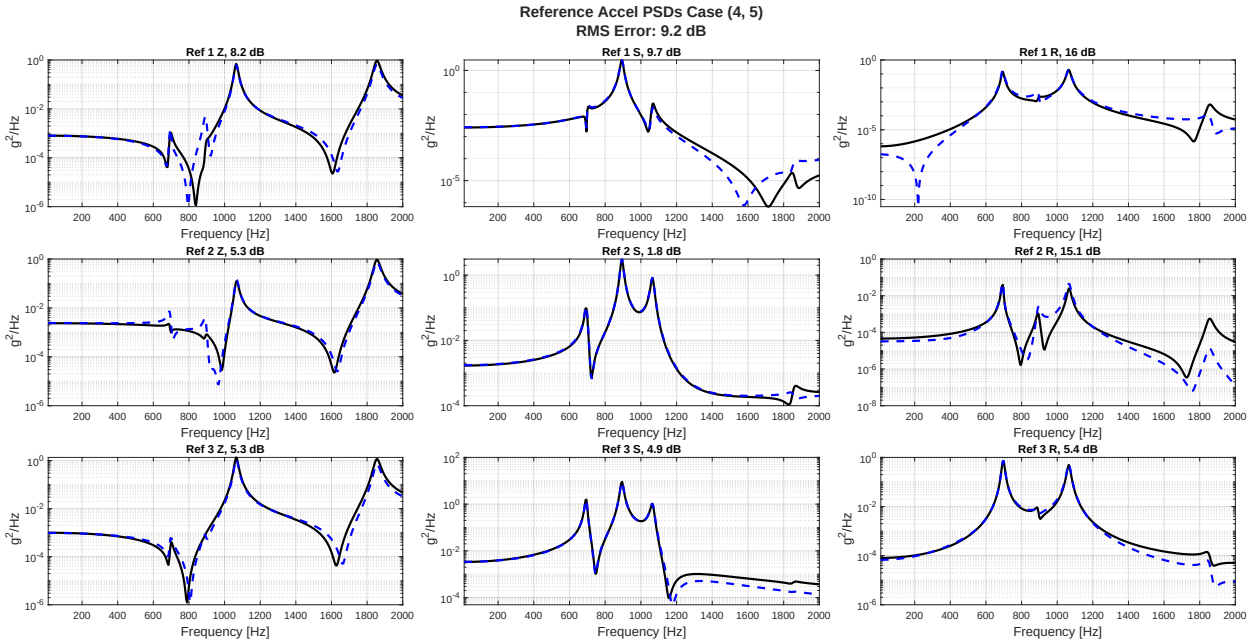


Figure 174: Reference Accels, No Noise, Case (4,5)

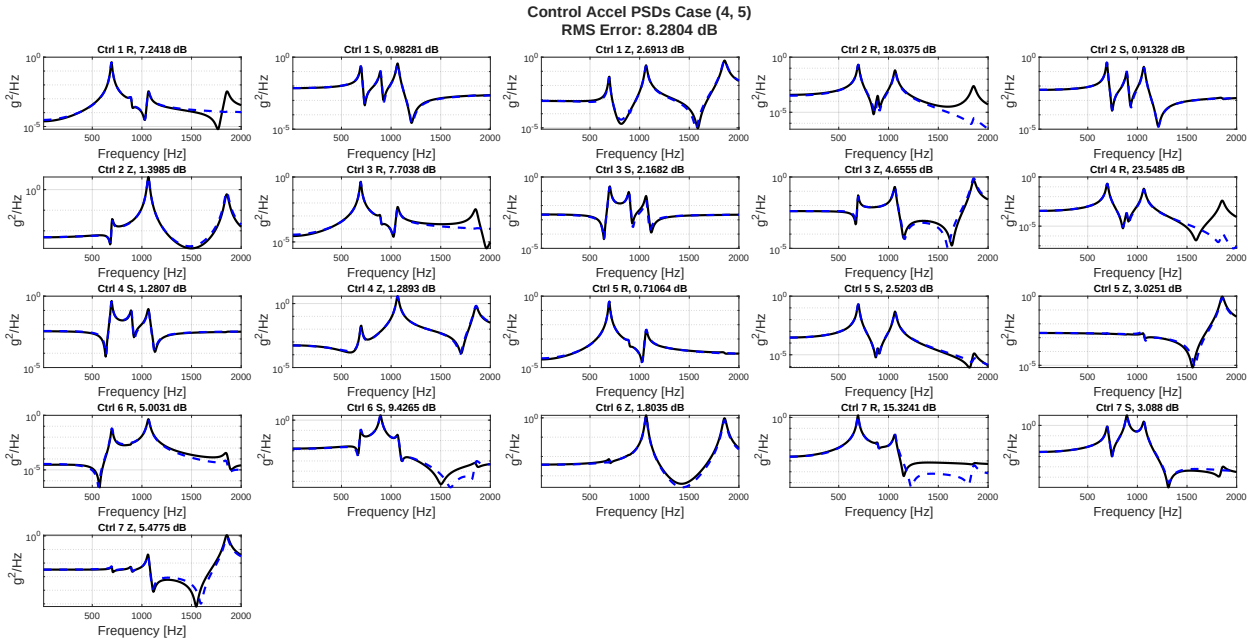


Figure 175: Control Accels, No Noise, Case (4,5)

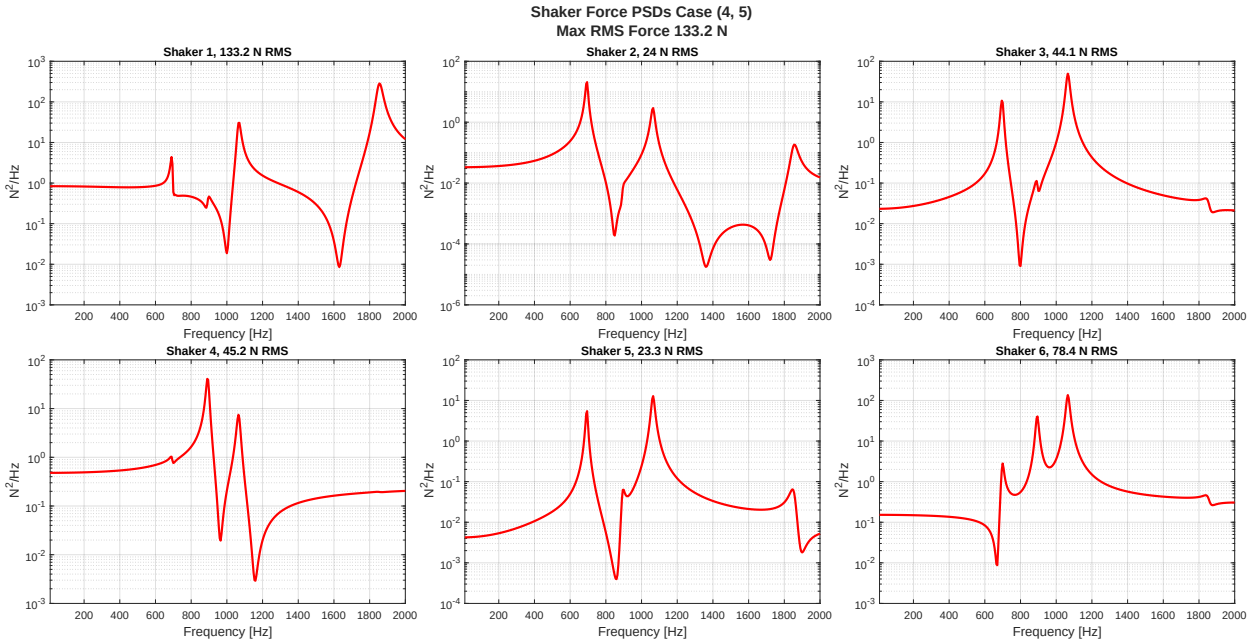


Figure 176: Shaker Forces, No Noise, Case (4,5)

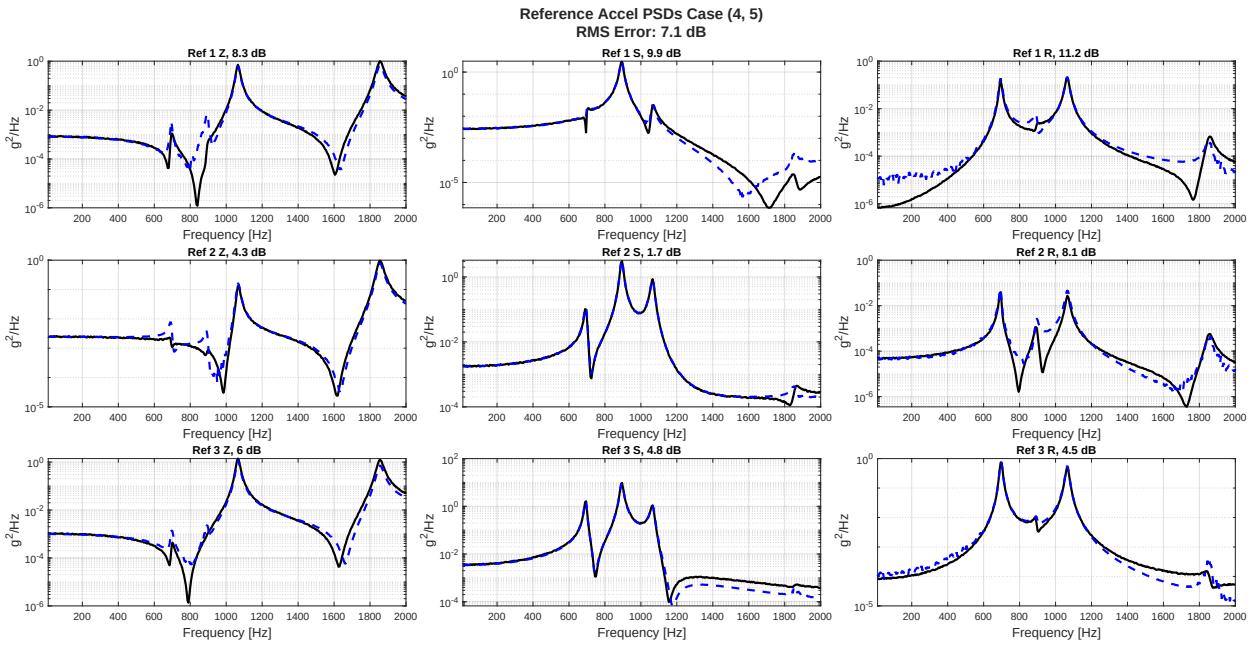


Figure 177: Reference Accels, Noise, No CN, Case (4,5)

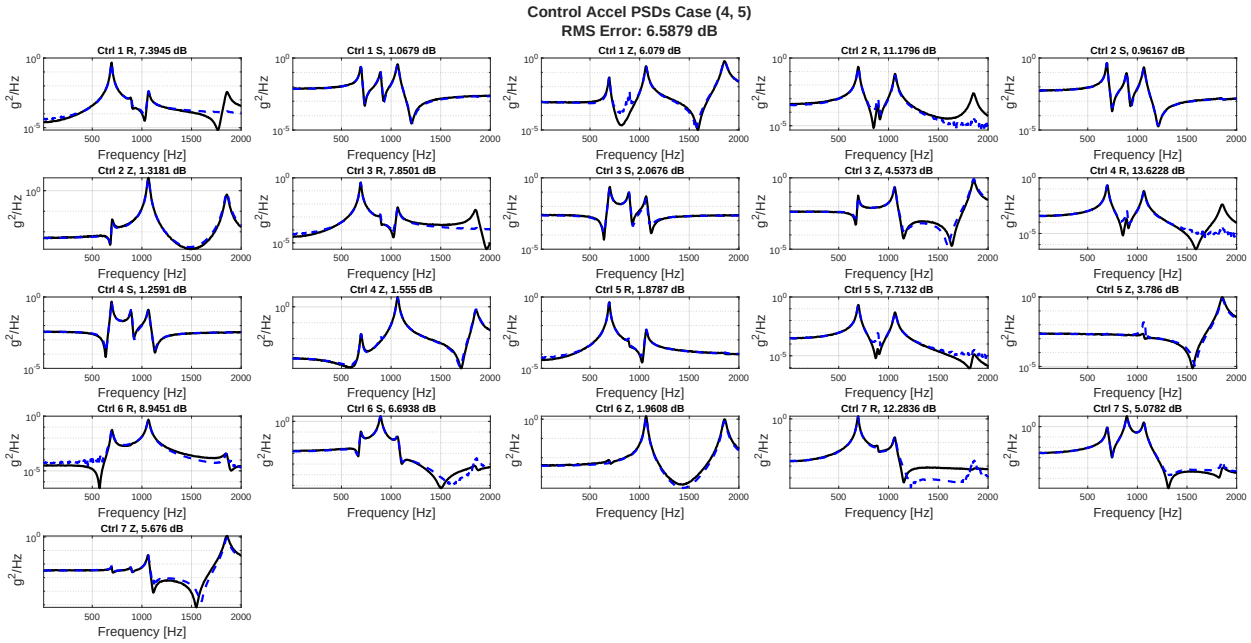


Figure 178: Control Accels, Noise, No CN, Case (4,5)

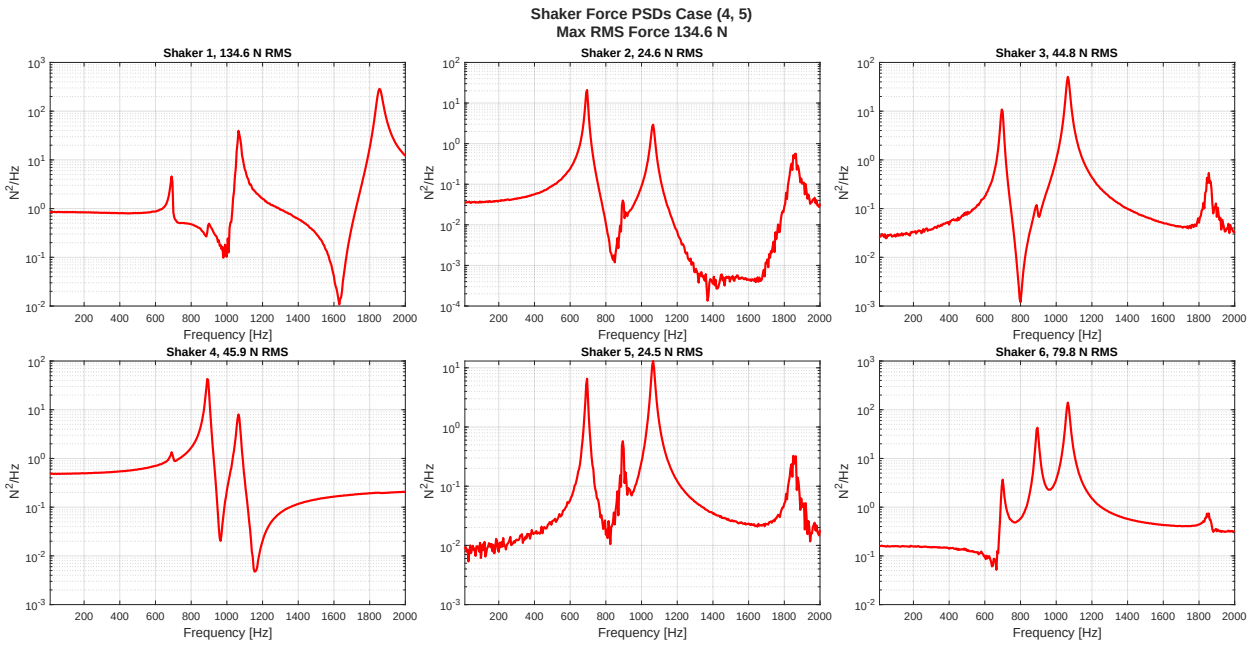


Figure 179: Shaker Forces, Noise, No CN, Case (4,5)

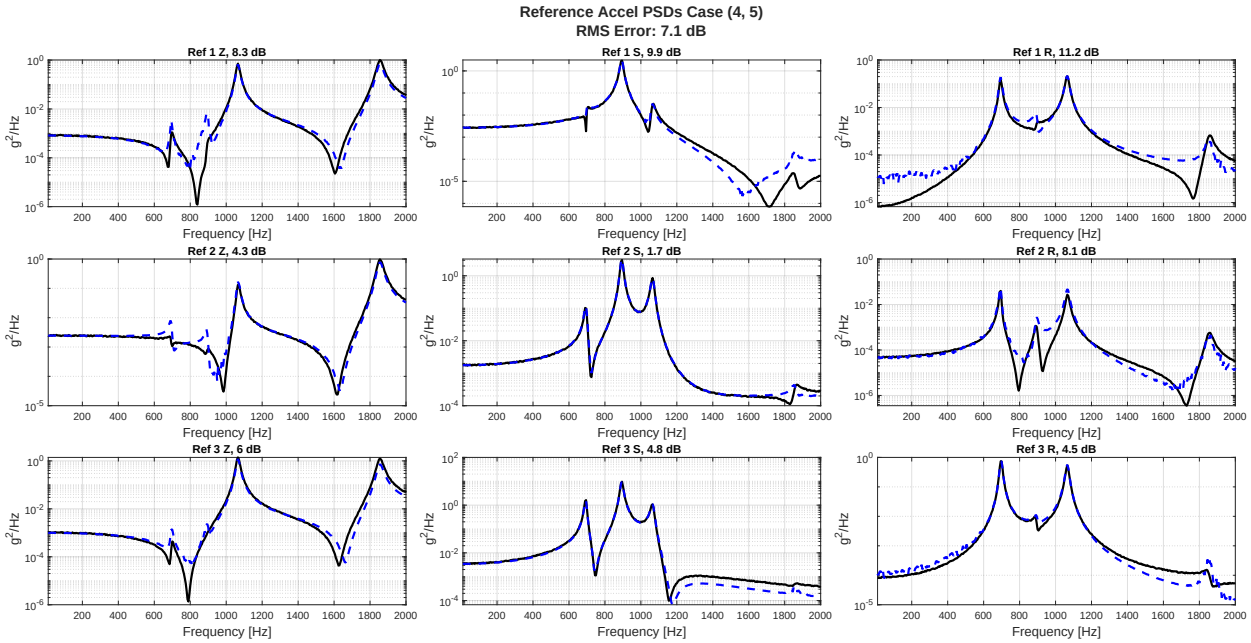


Figure 180: Reference Accels, Noise, with CN, Case (4,5)

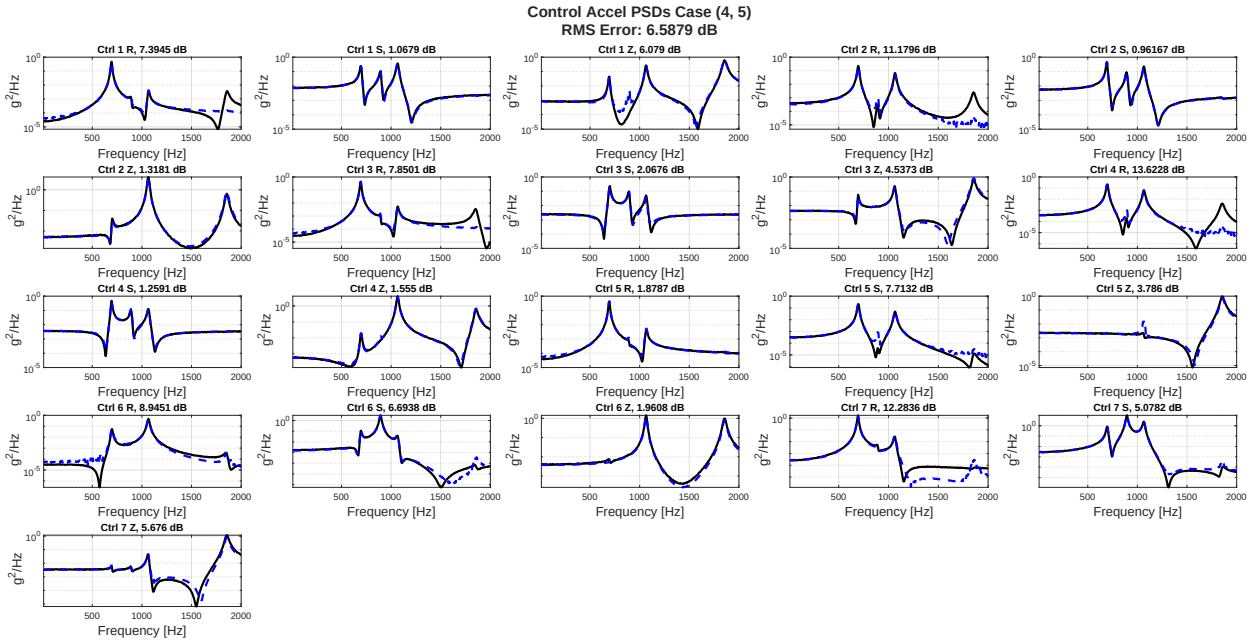


Figure 181: Control Accels, Noise, with CN, Case (4,5)

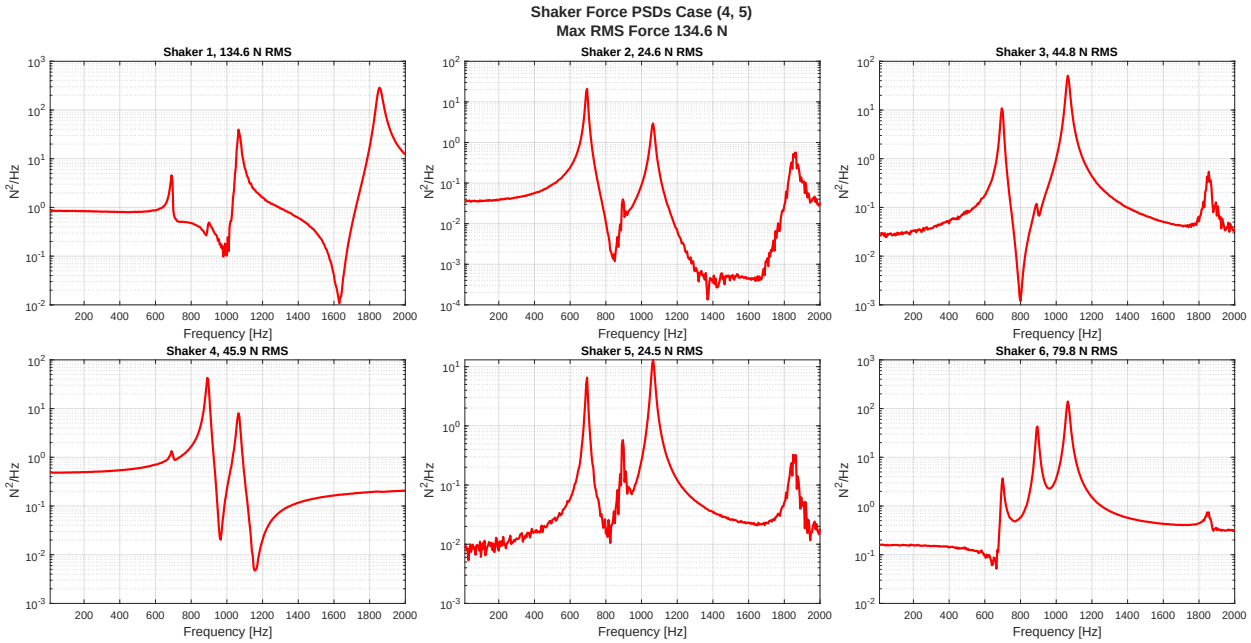


Figure 182: Shaker Forces, Noise, with CN, Case (4,5)

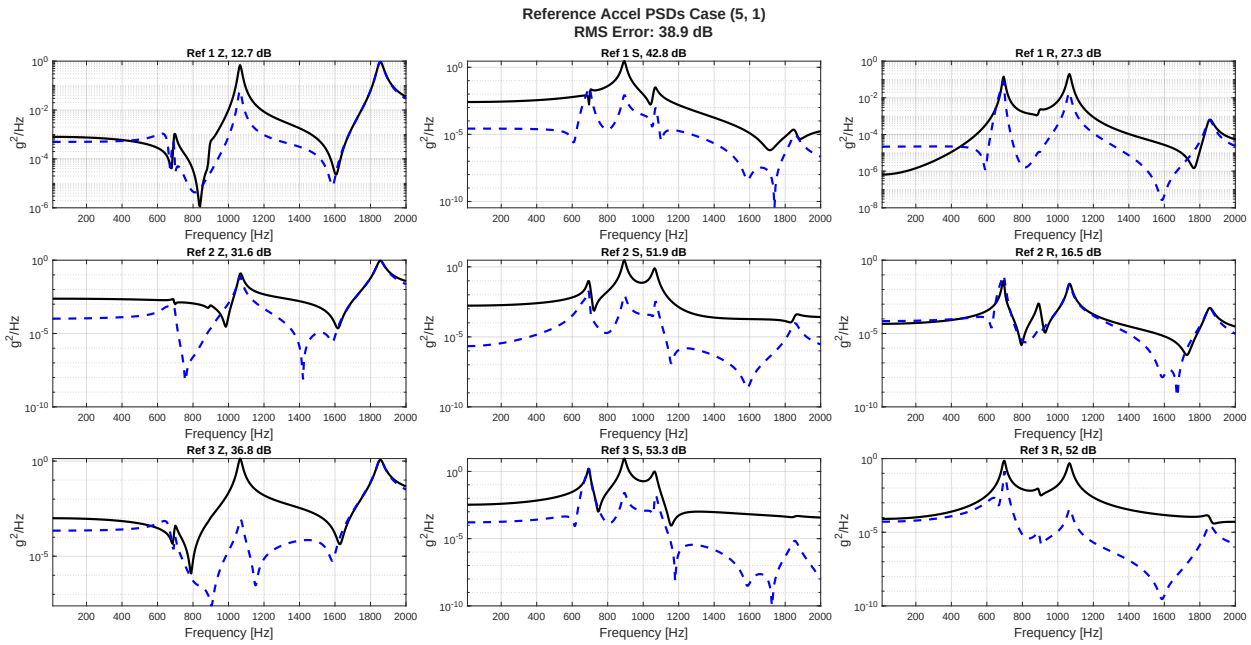


Figure 183: Reference Accels, No Noise, Case (5,1)

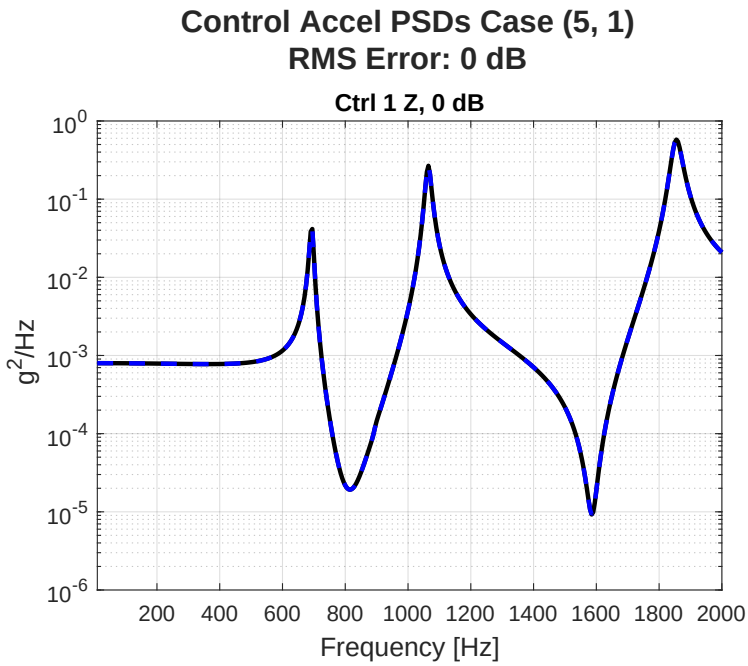


Figure 184: Control Accels, No Noise, Case (5,1)

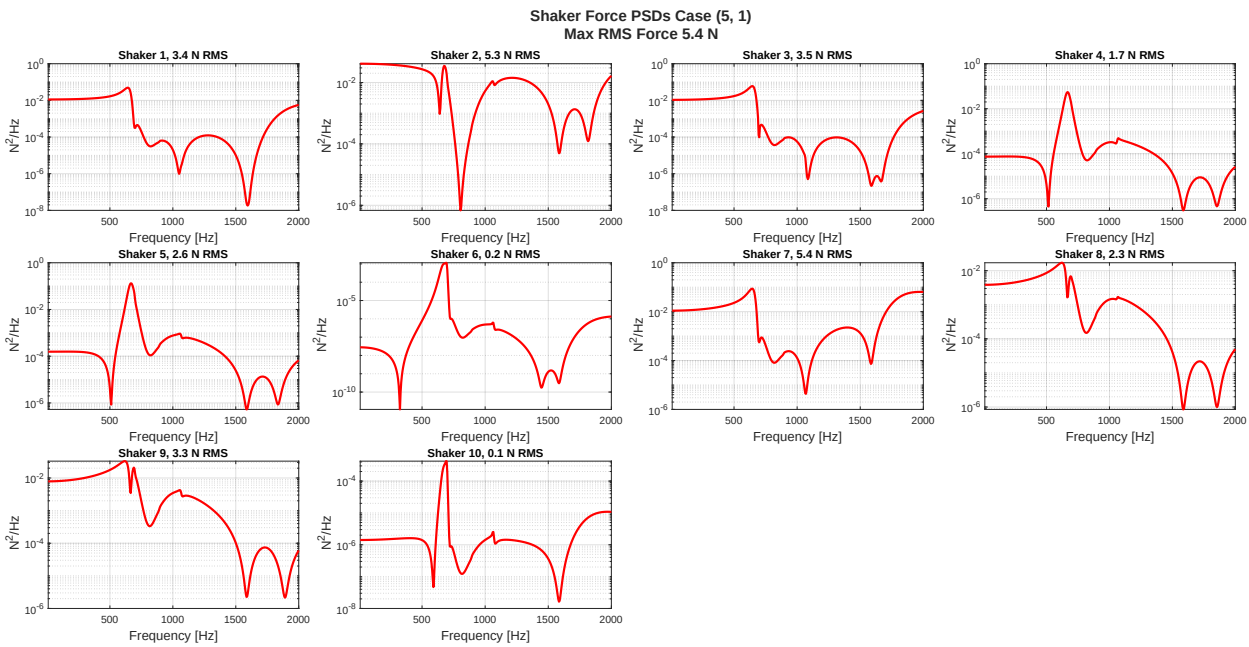


Figure 185: Shaker Forces, No Noise, Case (5,1)

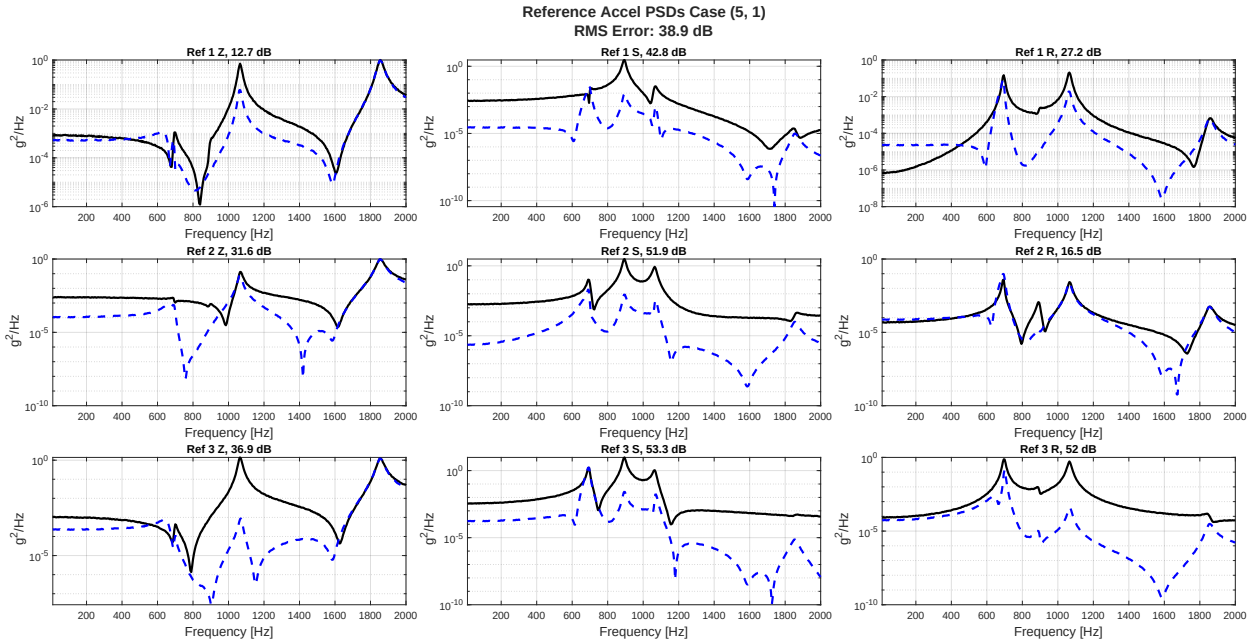


Figure 186: Reference Accels, Noise, No CN, Case (5,1)

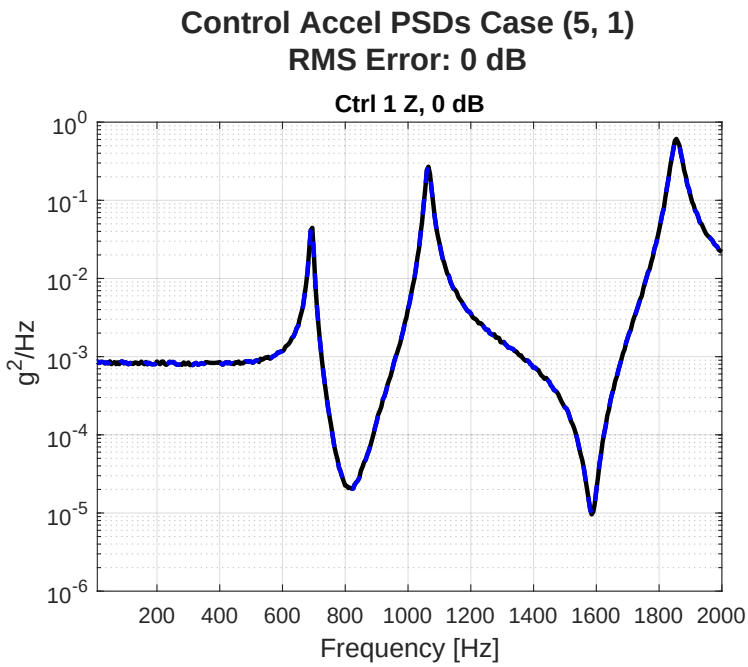


Figure 187: Control Accels, Noise, No CN, Case (5,1)

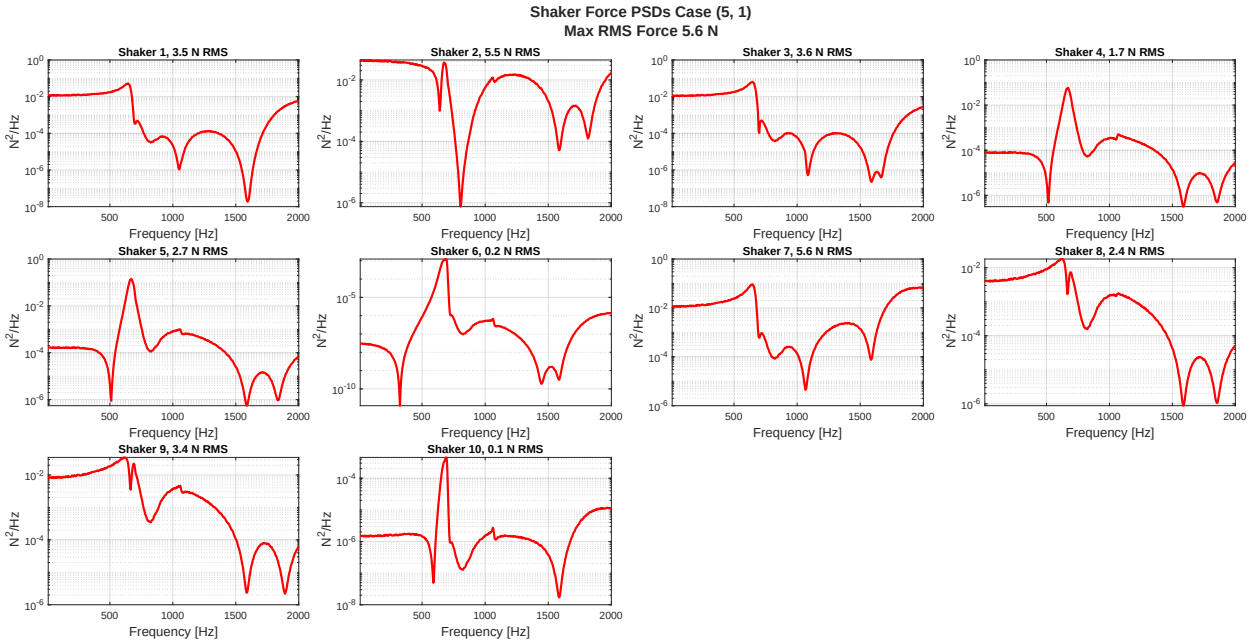


Figure 188: Shaker Forces, Noise, No CN, Case (5,1)

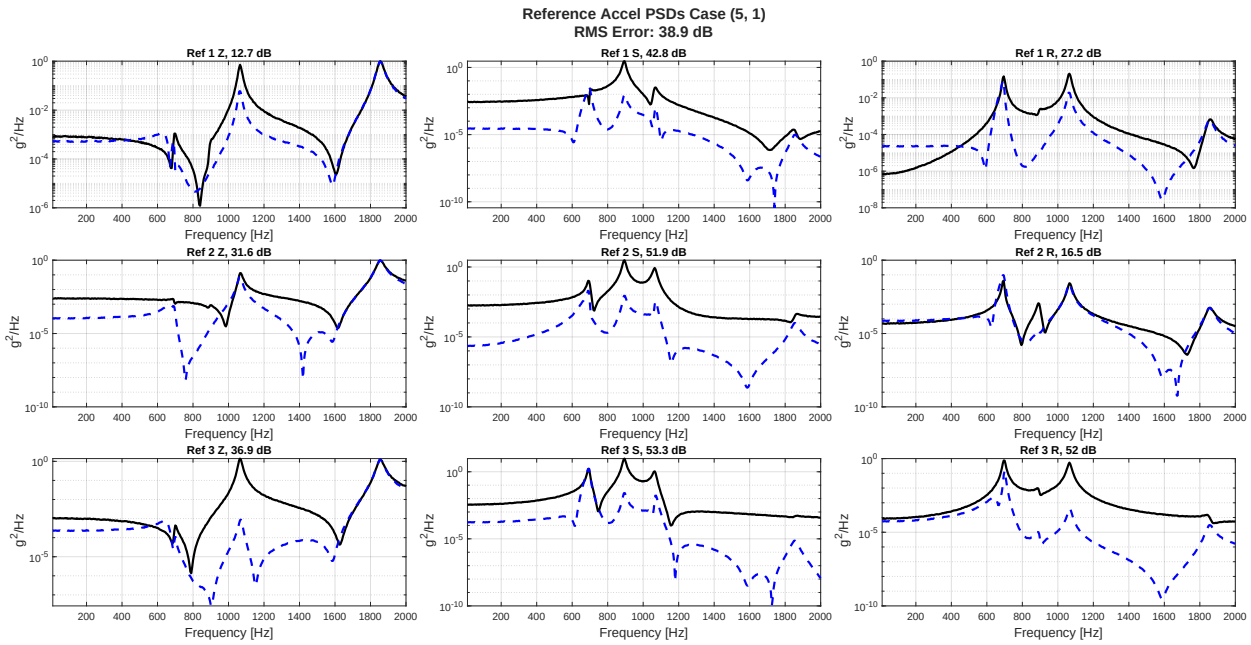


Figure 189: Reference Accels, Noise, with CN, Case (5,1)

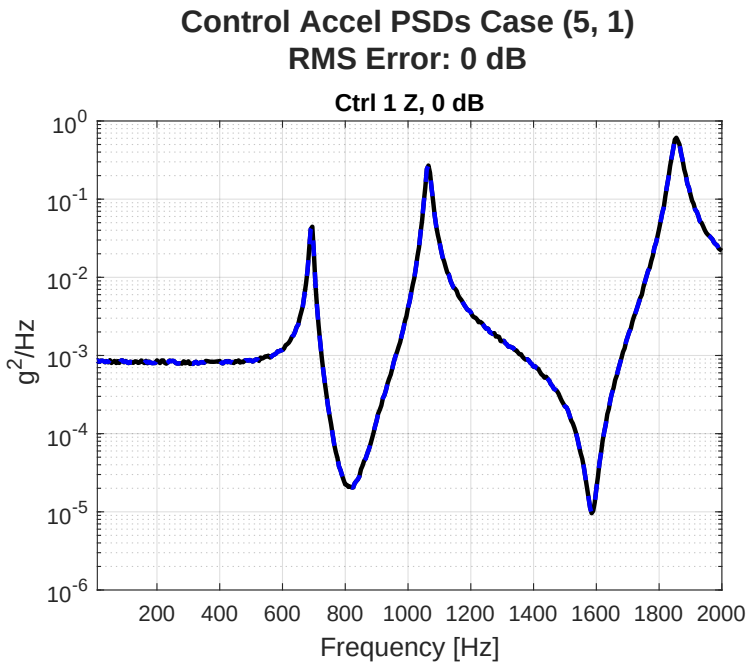


Figure 190: Control Accels, Noise, with CN, Case (5,1)

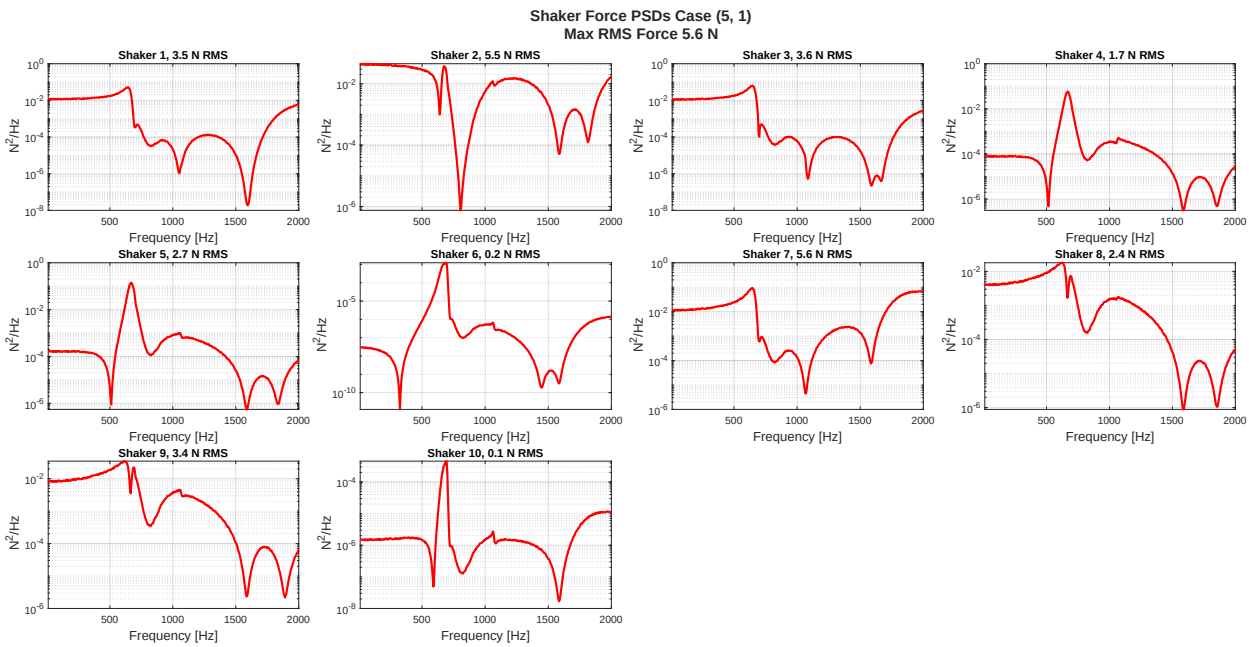


Figure 191: Shaker Forces, Noise, with CN, Case (5,1)

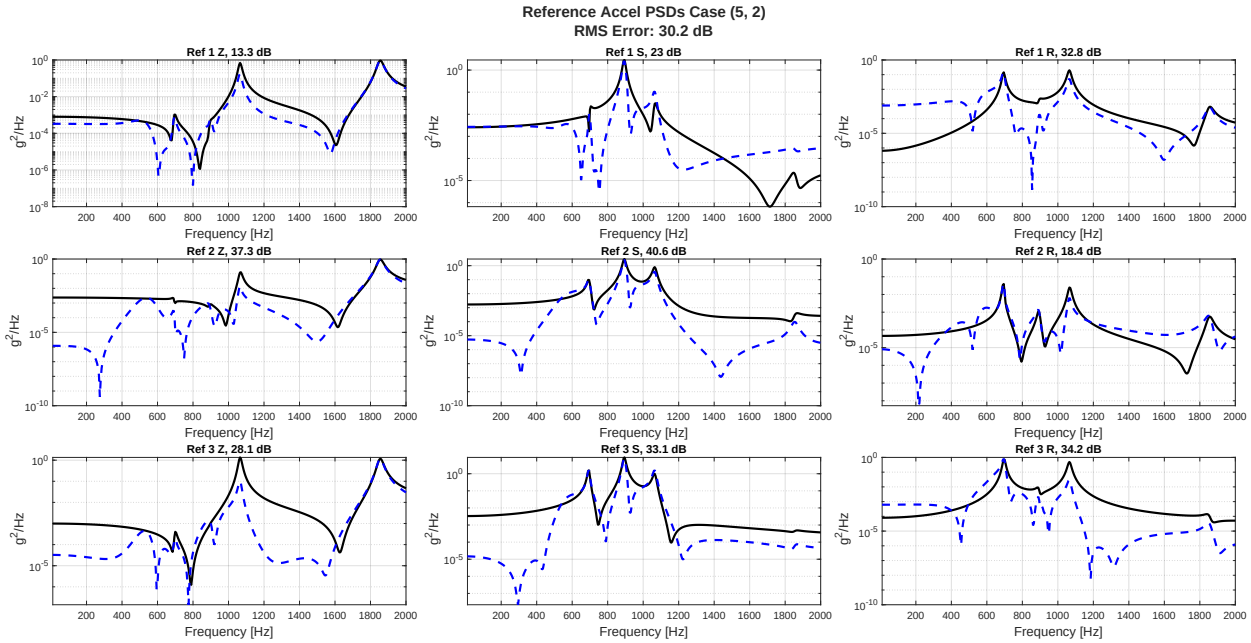


Figure 192: Reference Accels, No Noise, Case (5,2)

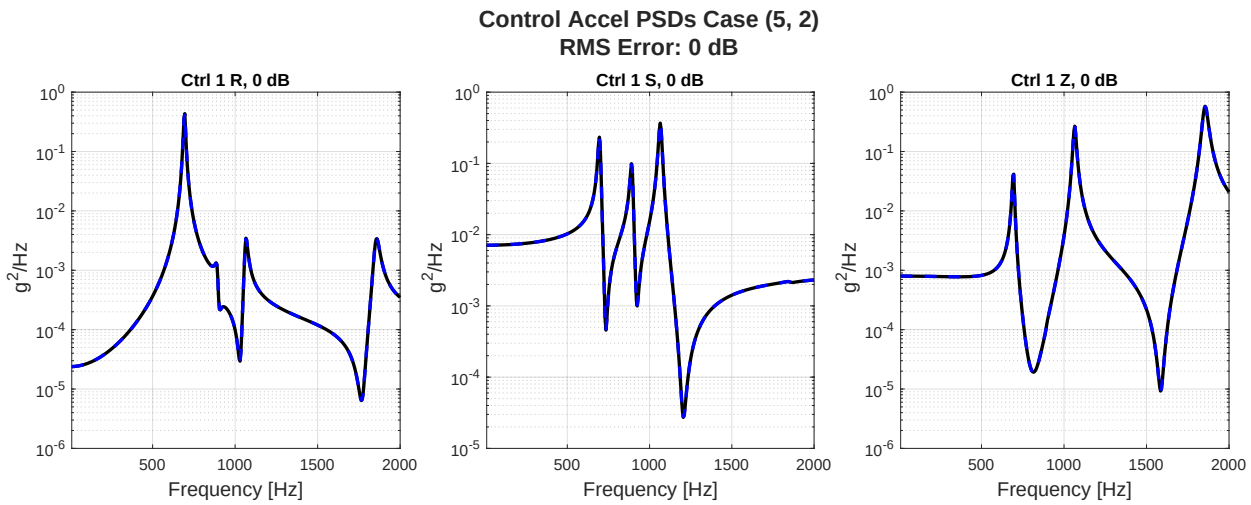


Figure 193: Control Accels, No Noise, Case (5,2)

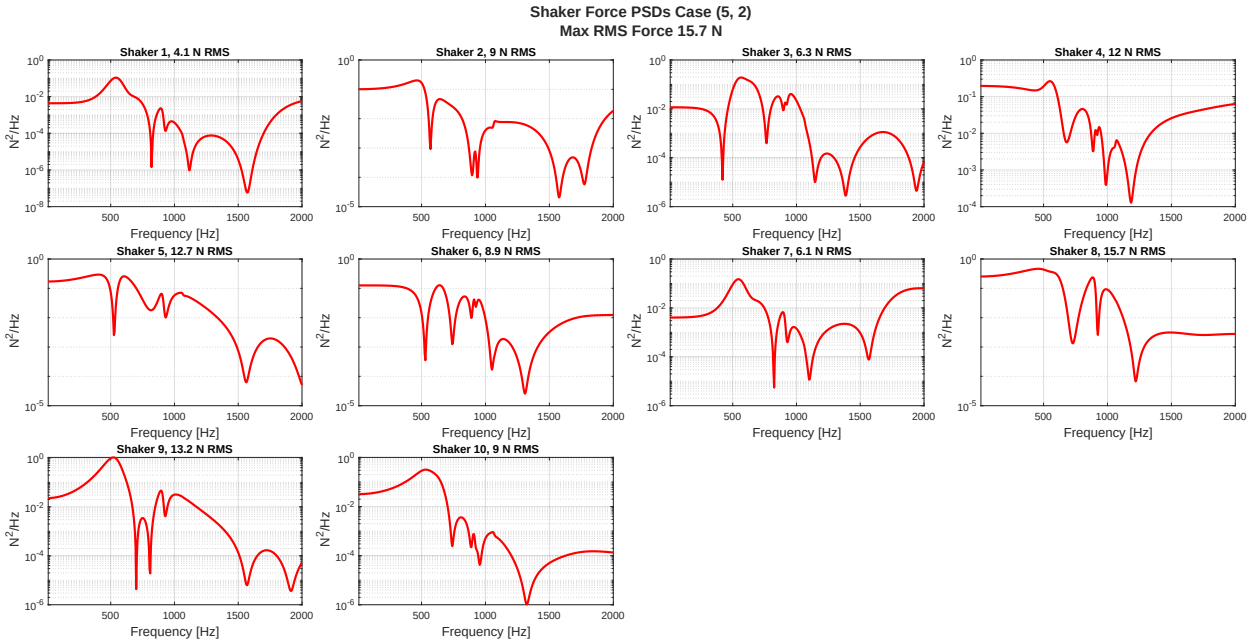


Figure 194: Shaker Forces, No Noise, Case (5,2)

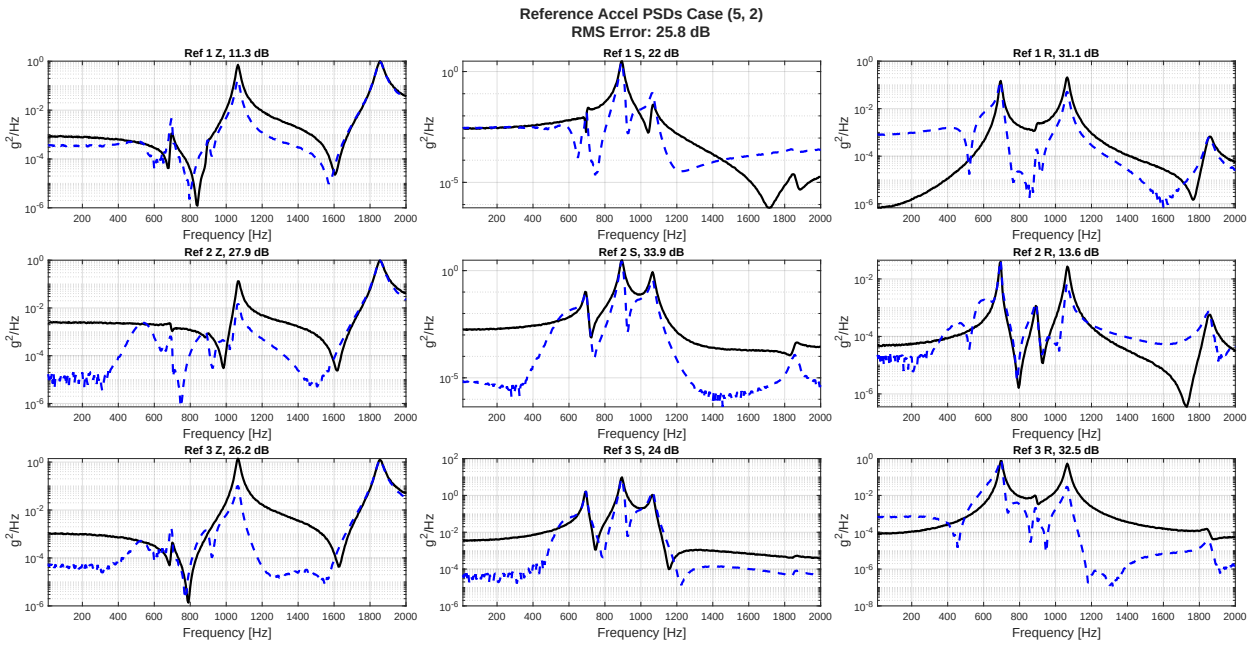


Figure 195: Reference Accels, Noise, No CN, Case (5,2)

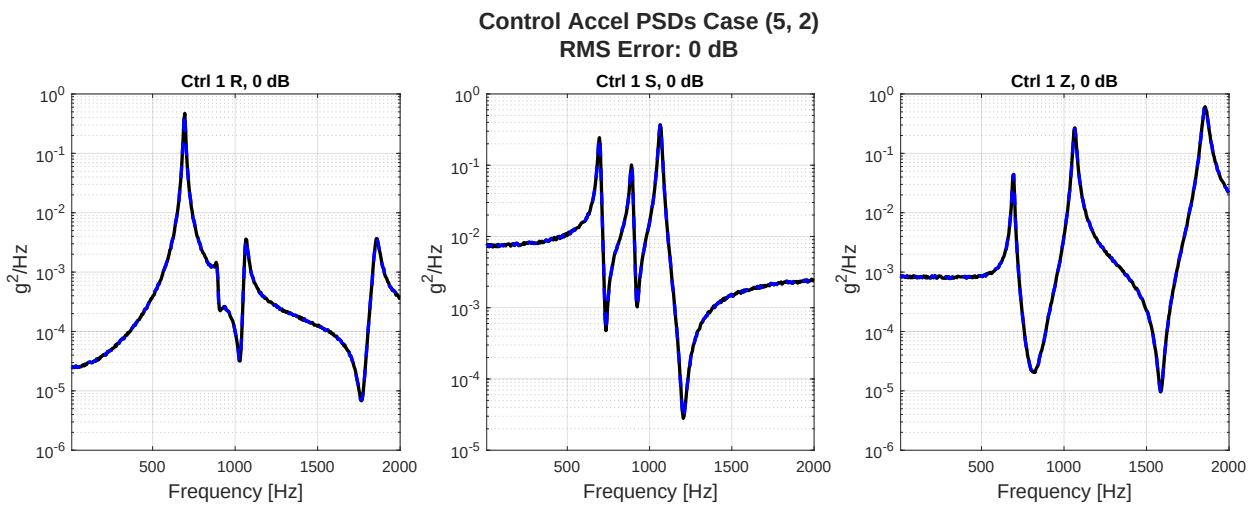


Figure 196: Control Accels, Noise, No CN, Case (5,2)

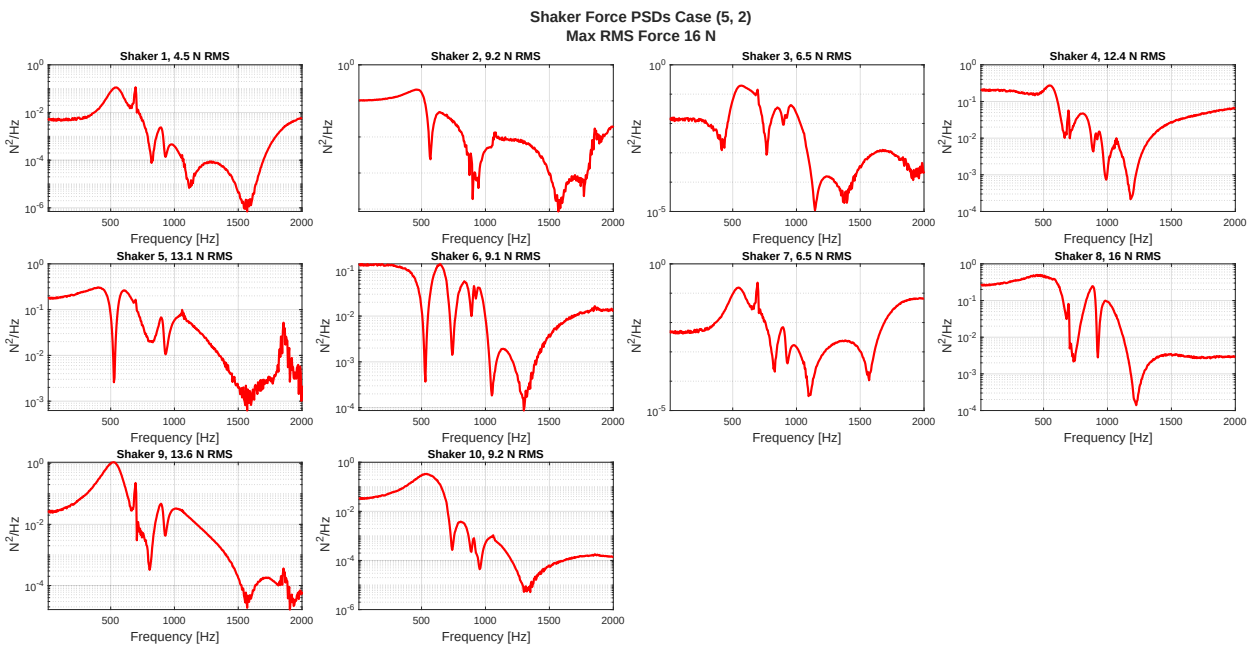


Figure 197: Shaker Forces, Noise, No CN, Case (5,2)

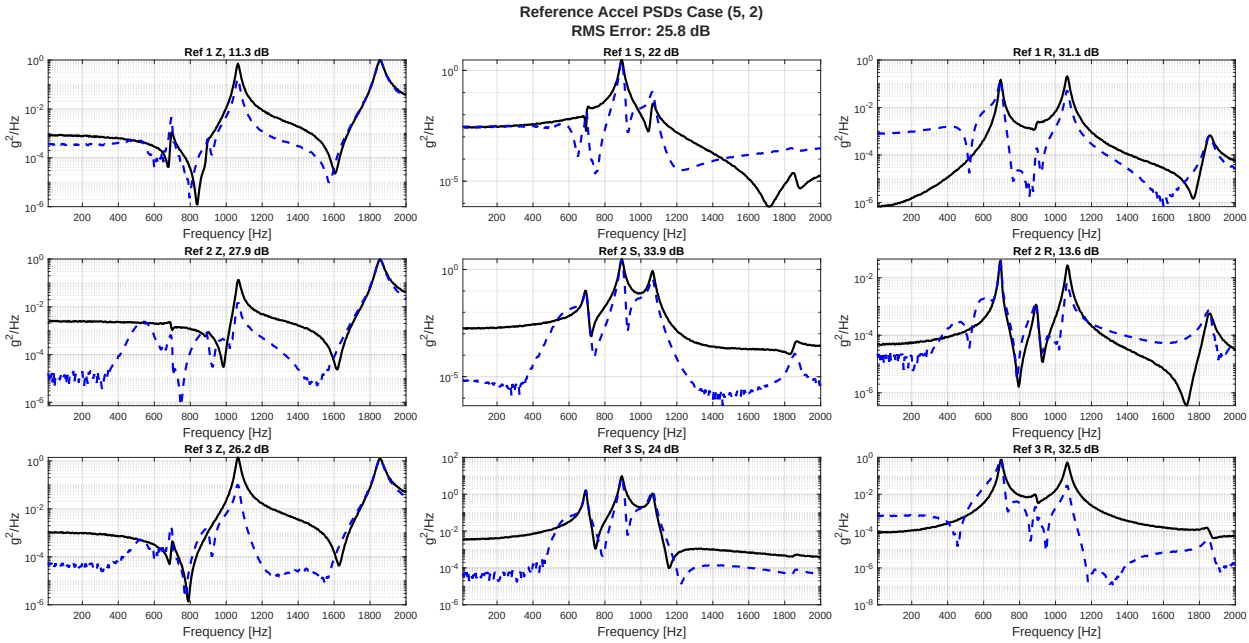


Figure 198: Reference Accels, Noise, with CN, Case (5,2)

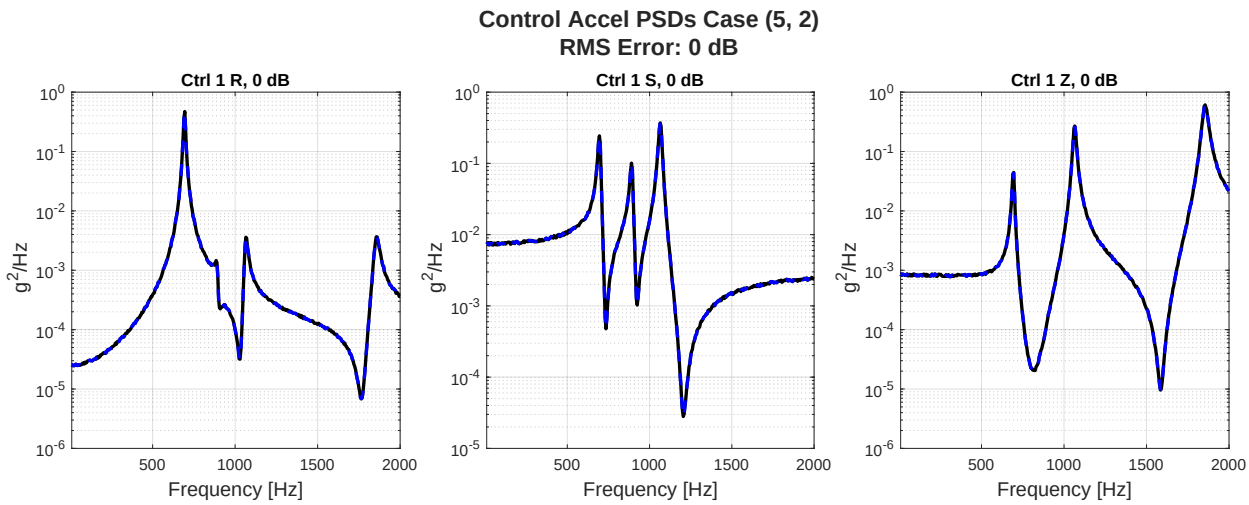


Figure 199: Control Accels, Noise, with CN, Case (5,2)

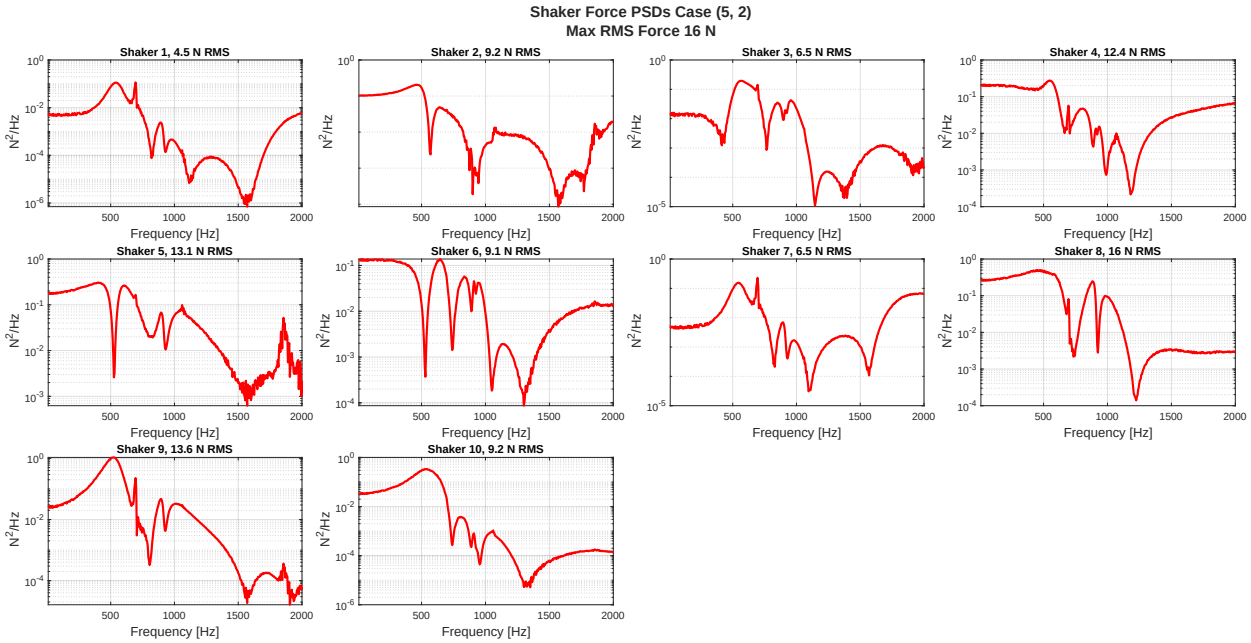


Figure 200: Shaker Forces, Noise, with CN, Case (5,2)

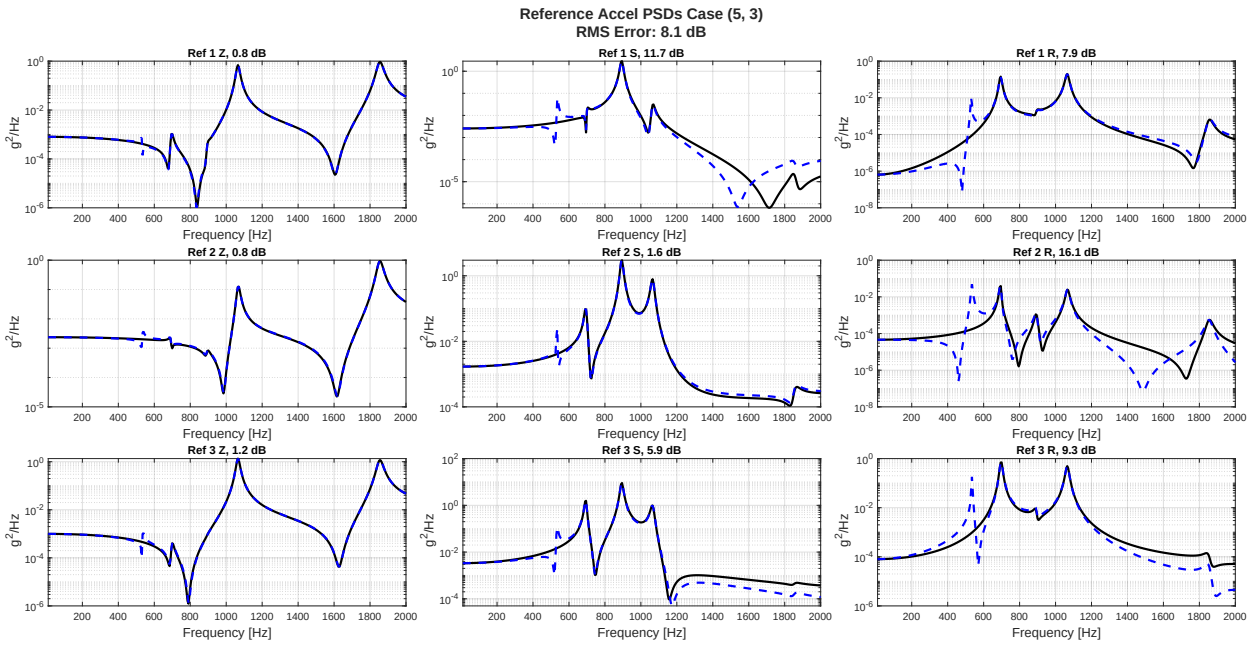


Figure 201: Reference Accels, No Noise, Case (5,3)

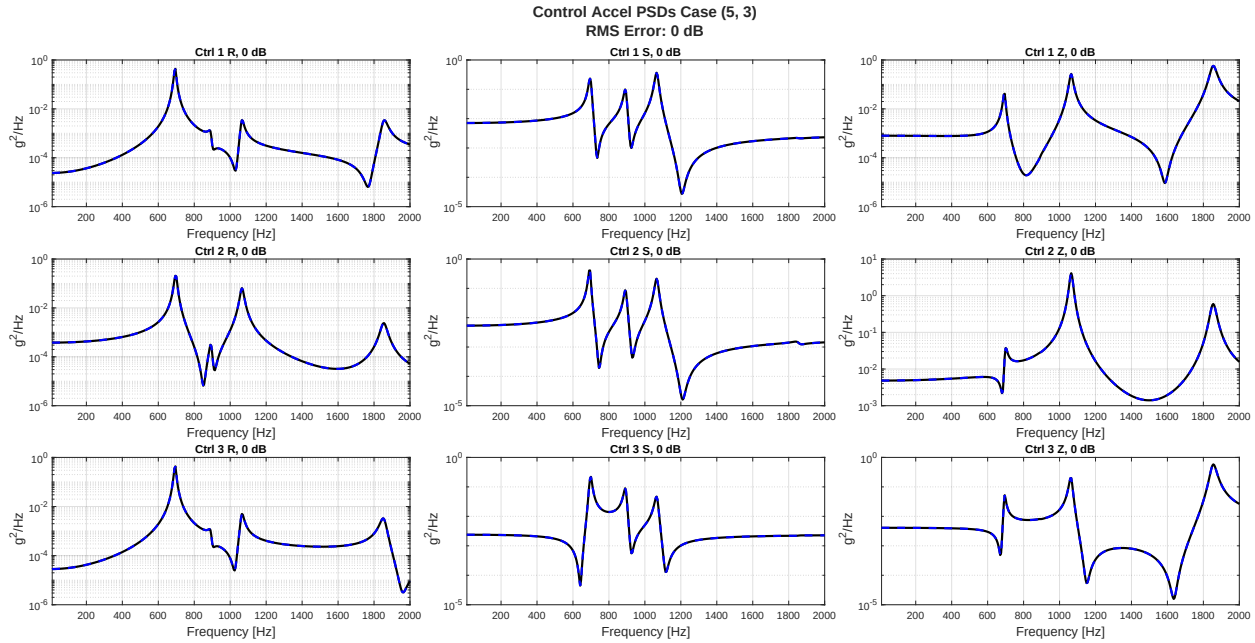


Figure 202: Control Accels, No Noise, Case (5,3)

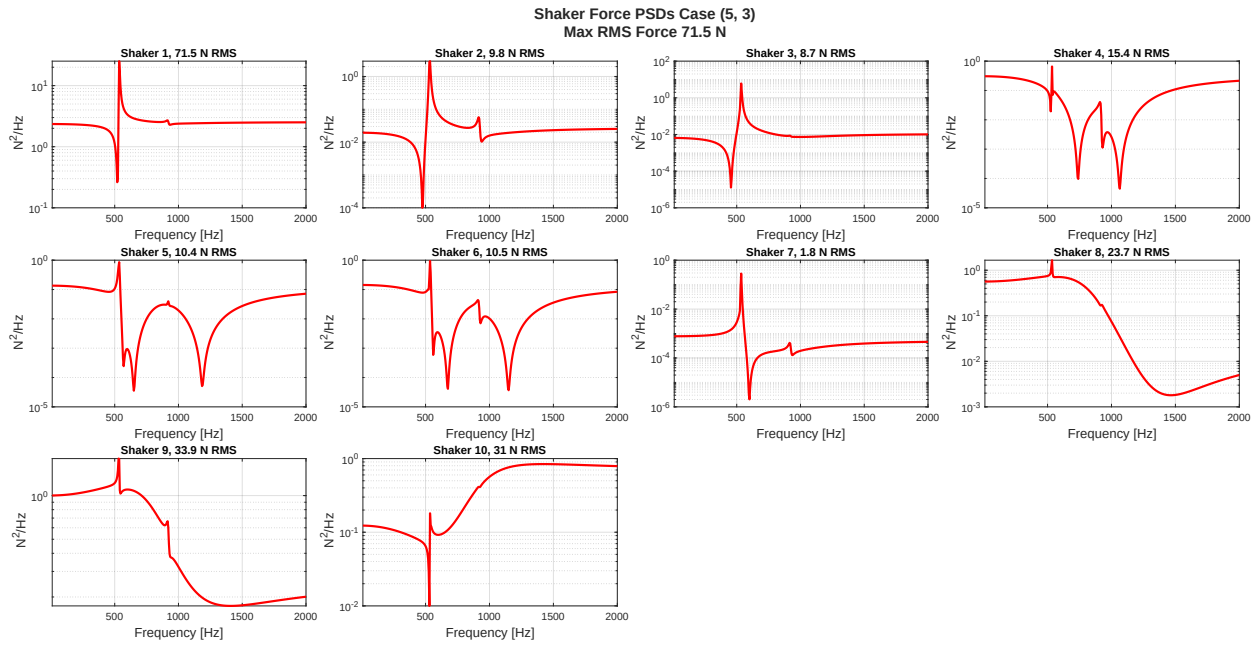


Figure 203: Shaker Forces, No Noise, Case (5,3)

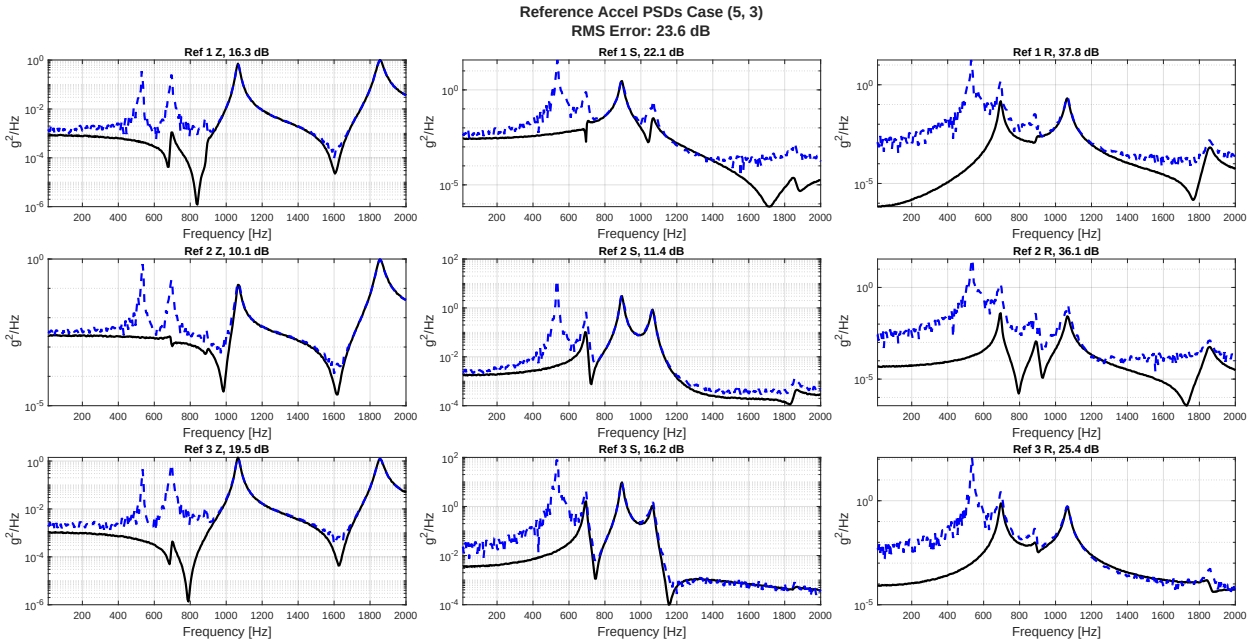


Figure 204: Reference Accels, Noise, No CN, Case (5,3)

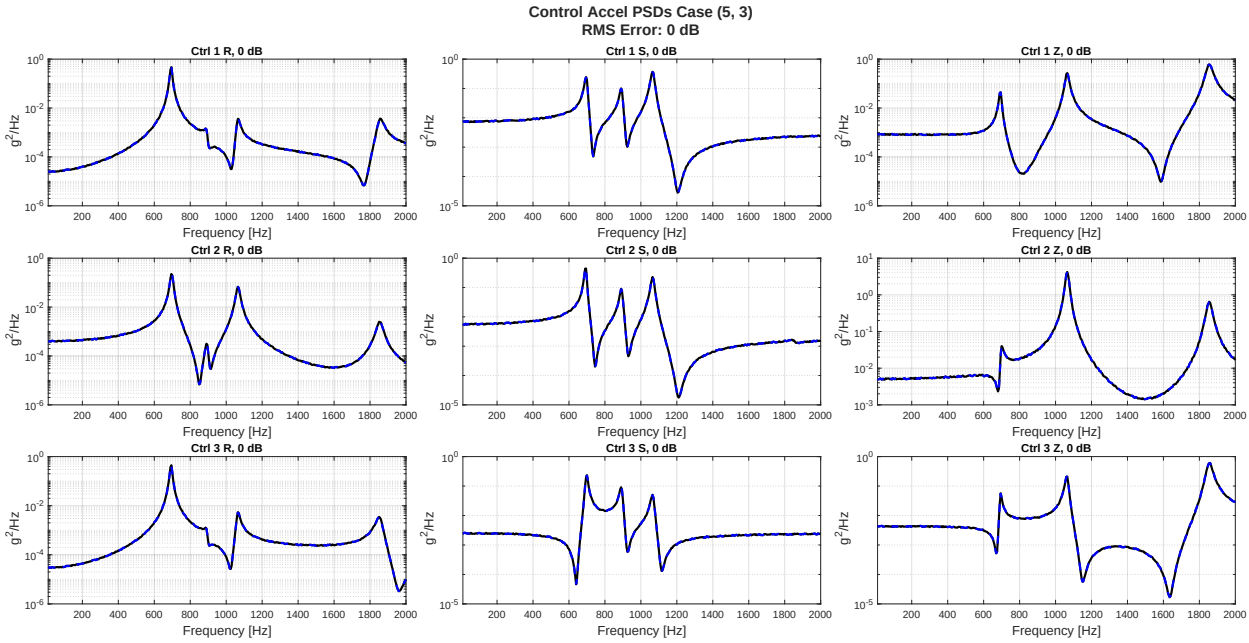


Figure 205: Control Accels, Noise, No CN, Case (5,3)

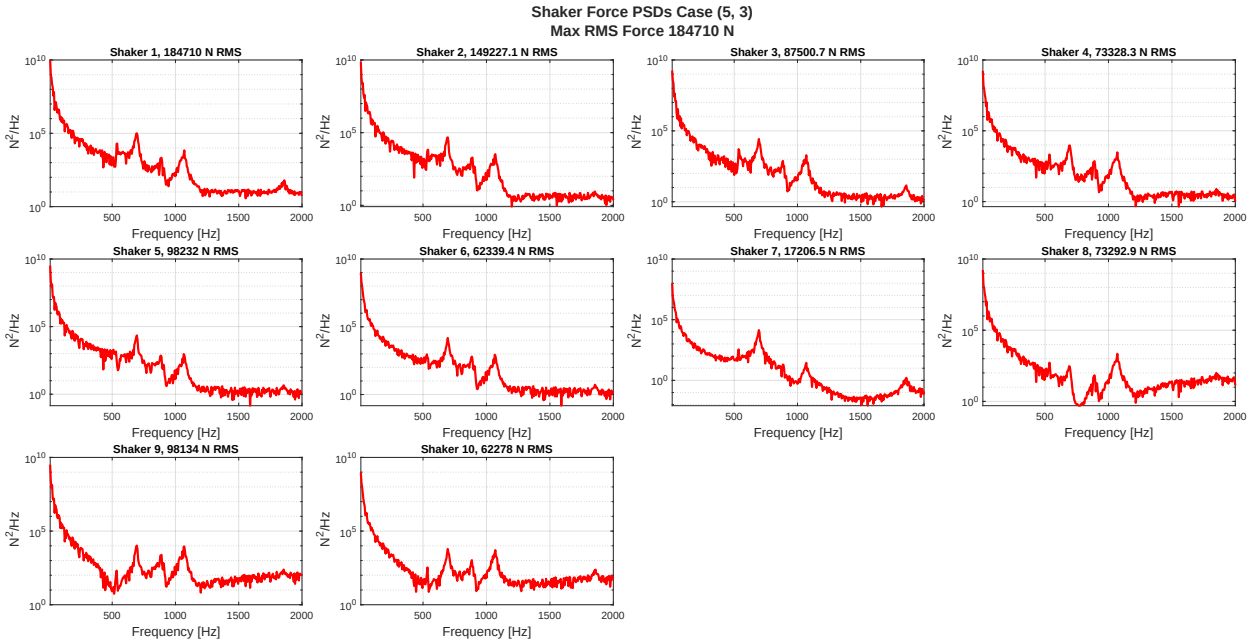


Figure 206: Shaker Forces, Noise, No CN, Case (5,3)

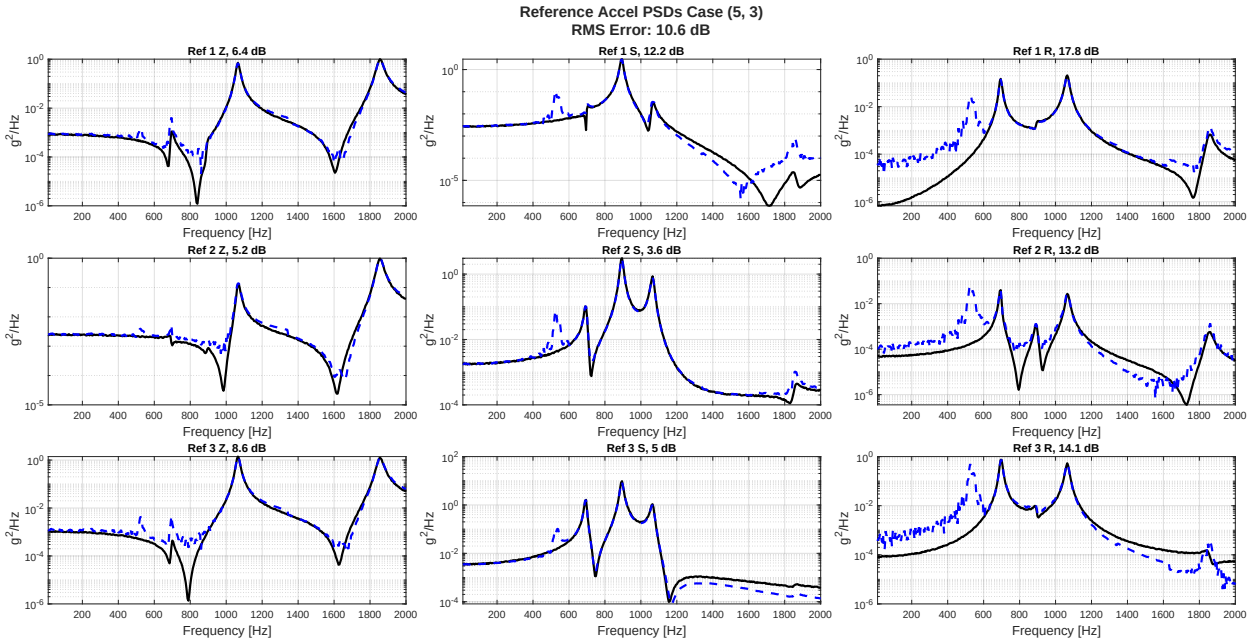


Figure 207: Reference Accels, Noise, with CN, Case (5,3)

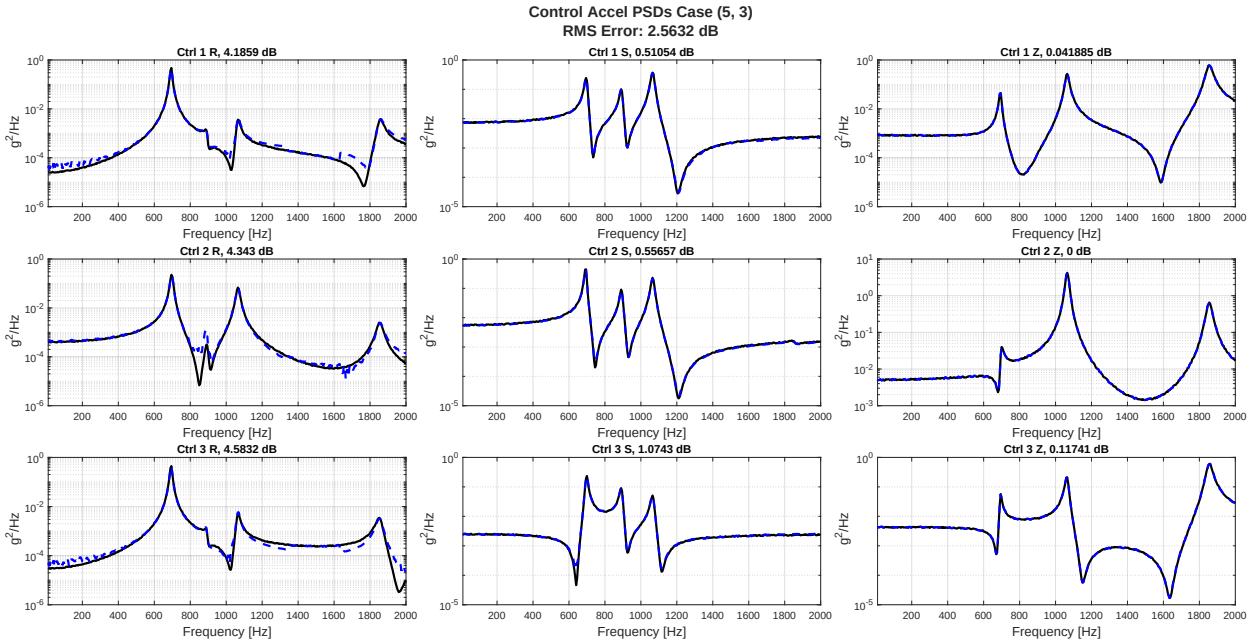


Figure 208: Control Accels, Noise, with CN, Case (5,3)

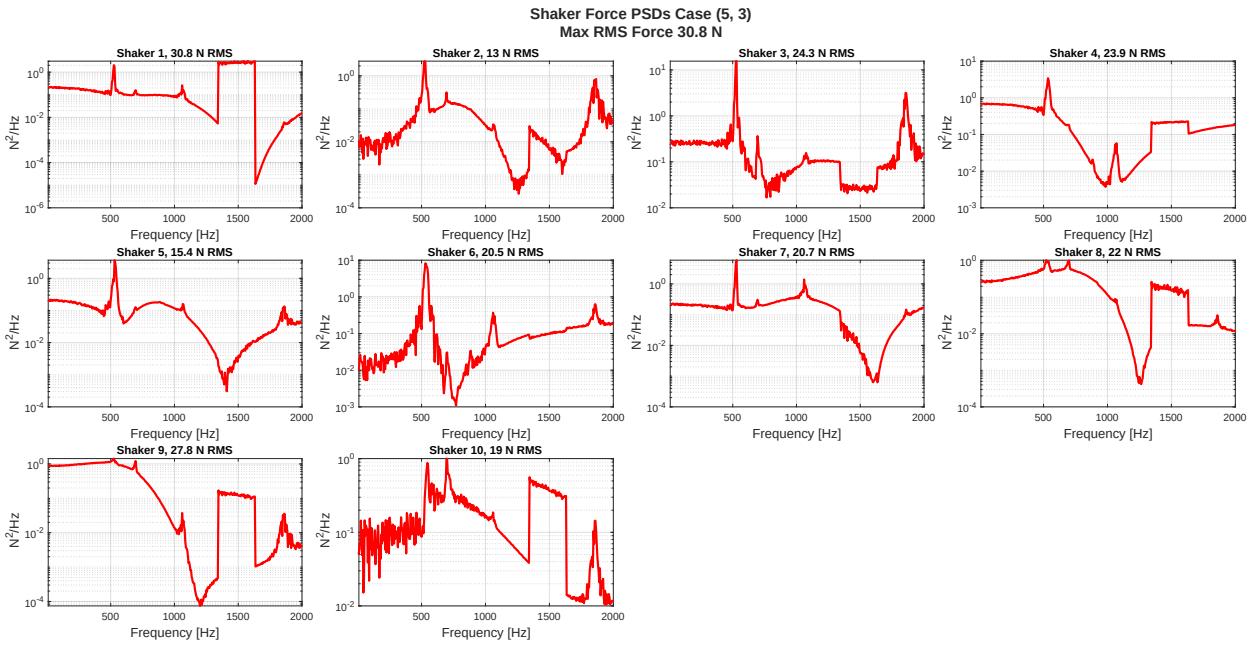


Figure 209: Shaker Forces, Noise, with CN, Case (5,3)

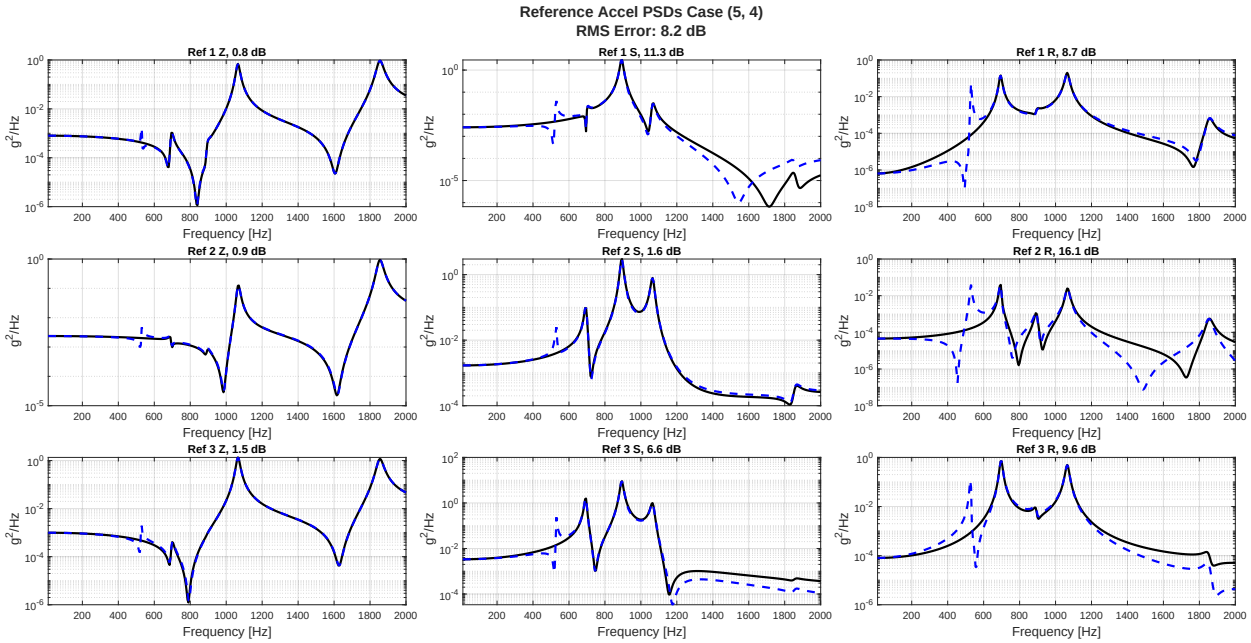


Figure 210: Reference Accels, No Noise, Case (5,4)

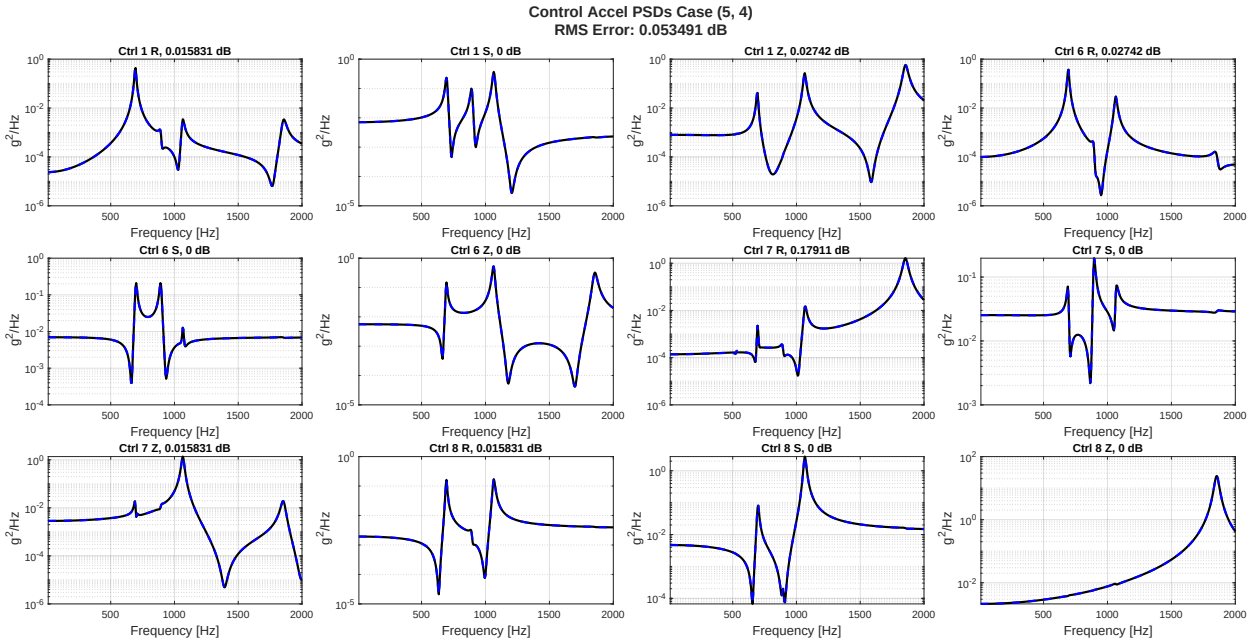


Figure 211: Control Accels, No Noise, Case (5,4)

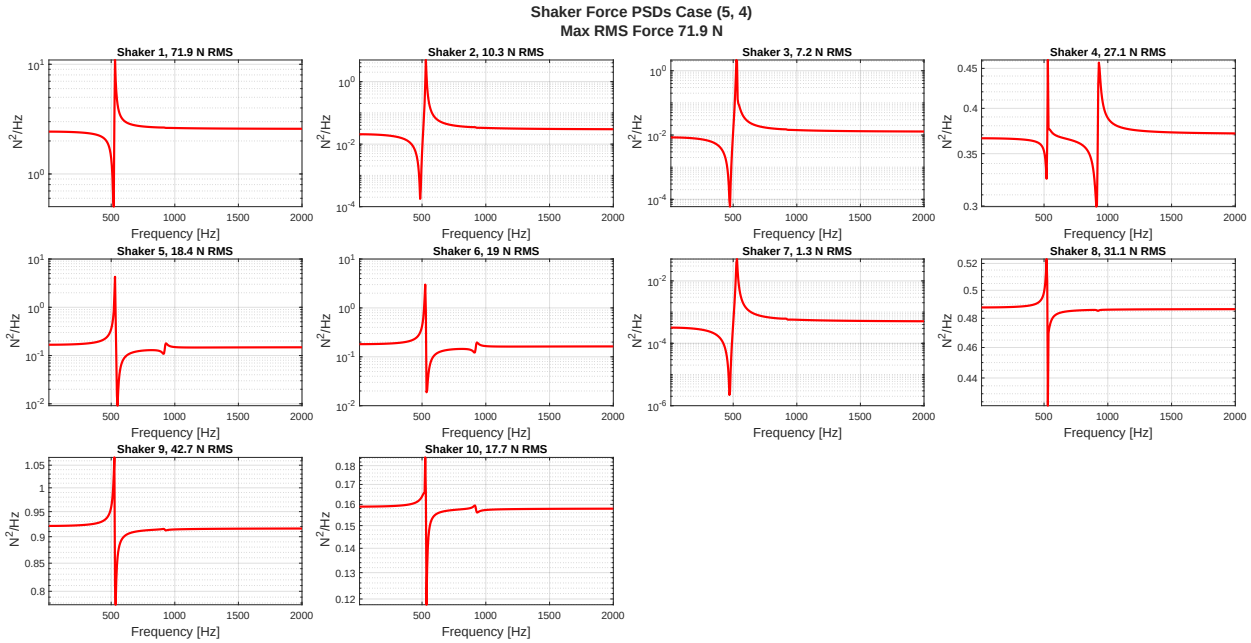


Figure 212: Shaker Forces, No Noise, Case (5,4)

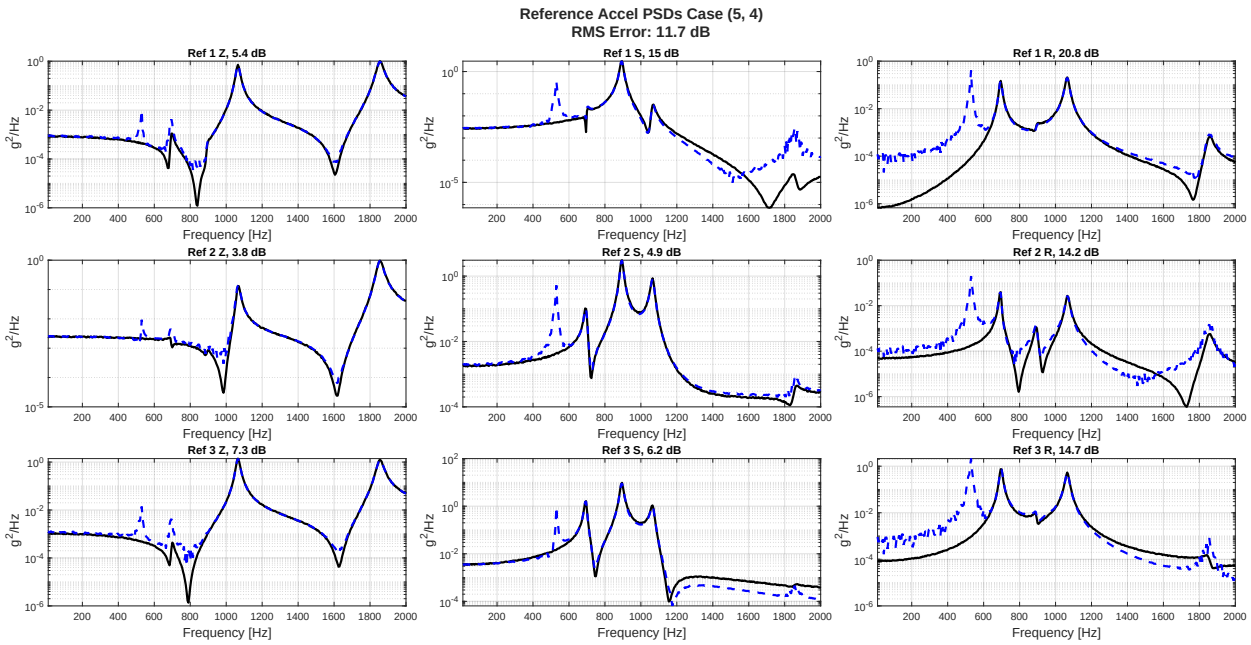


Figure 213: Reference Accels, Noise, No CN, Case (5,4)

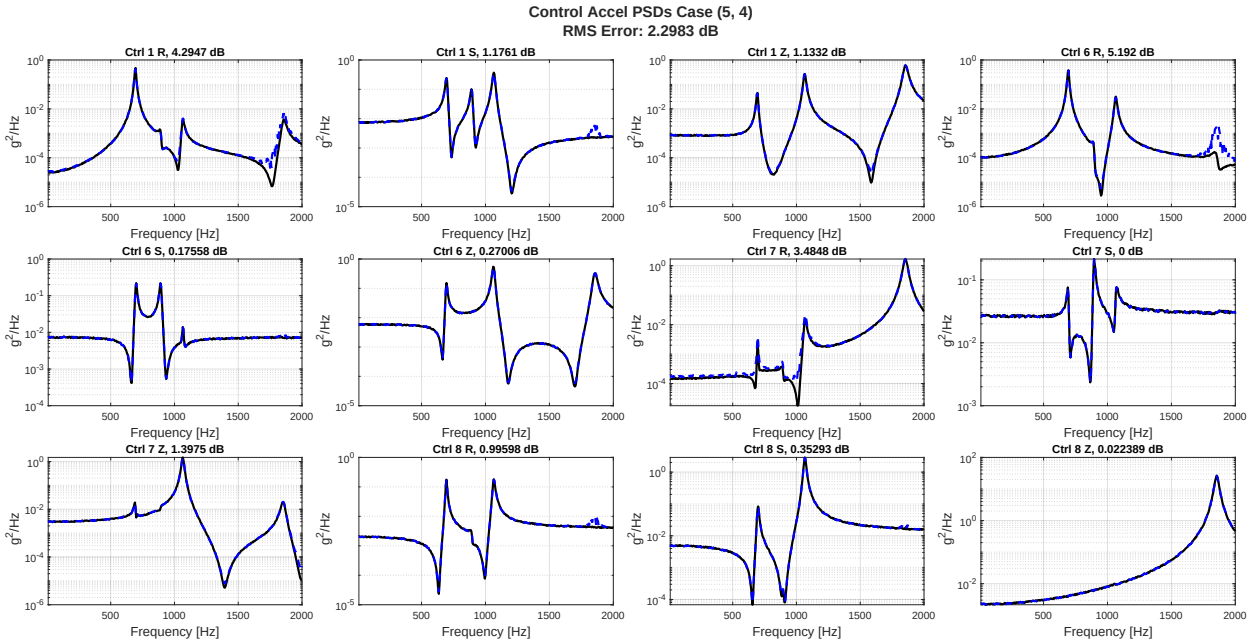


Figure 214: Control Accels, Noise, No CN, Case (5,4)

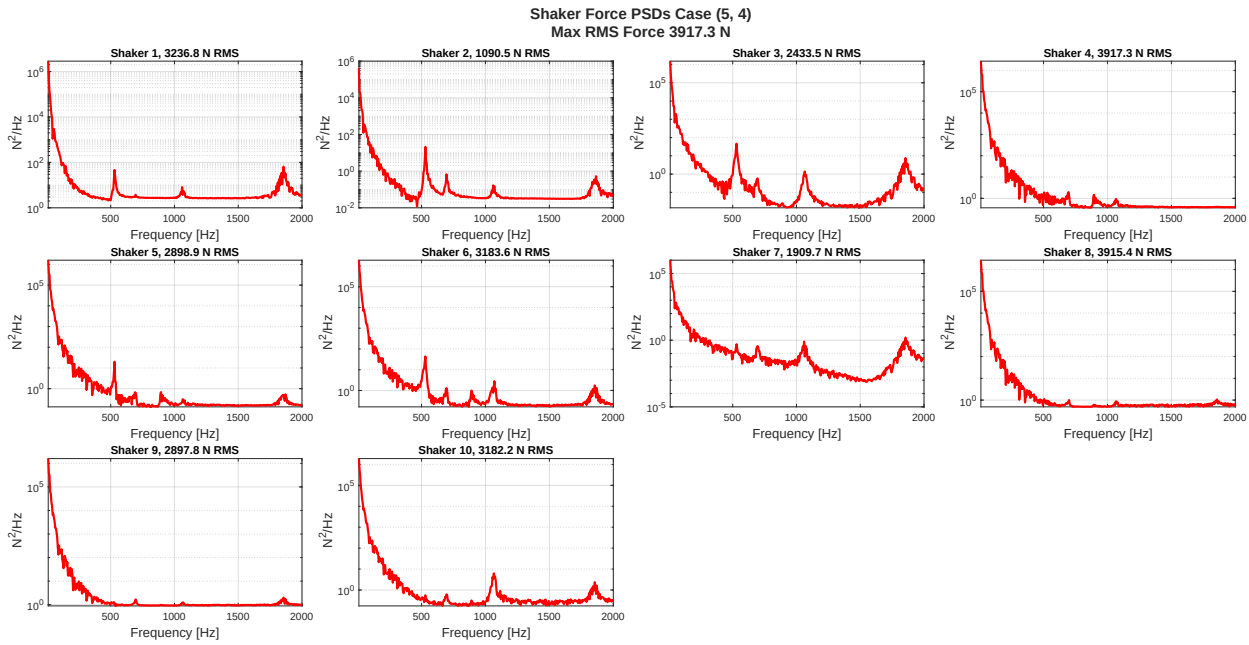


Figure 215: Shaker Forces, Noise, No CN, Case (5,4)

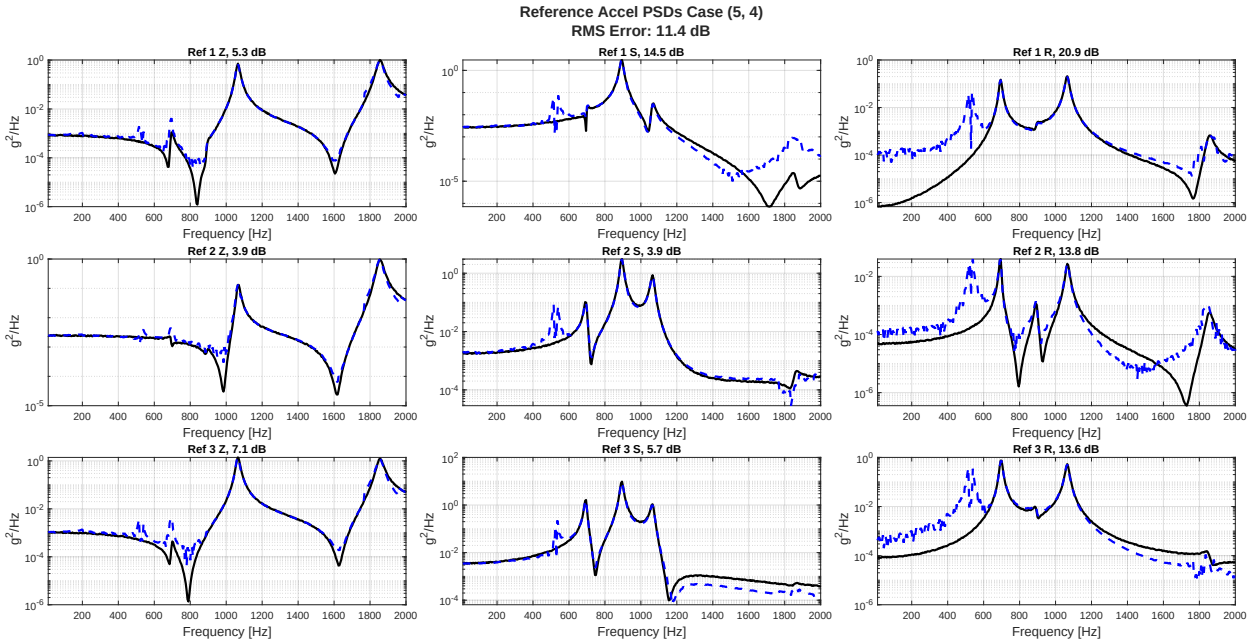


Figure 216: Reference Accels, Noise, with CN, Case (5,4)

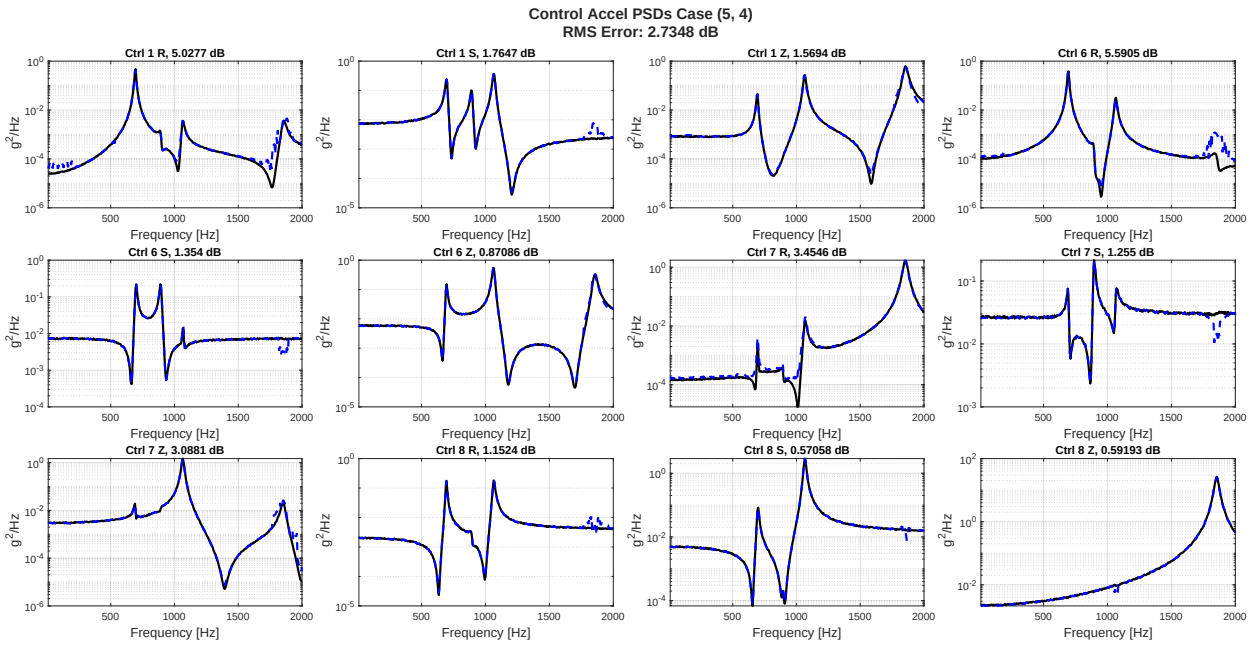


Figure 217: Control Accels, Noise, with CN, Case (5,4)

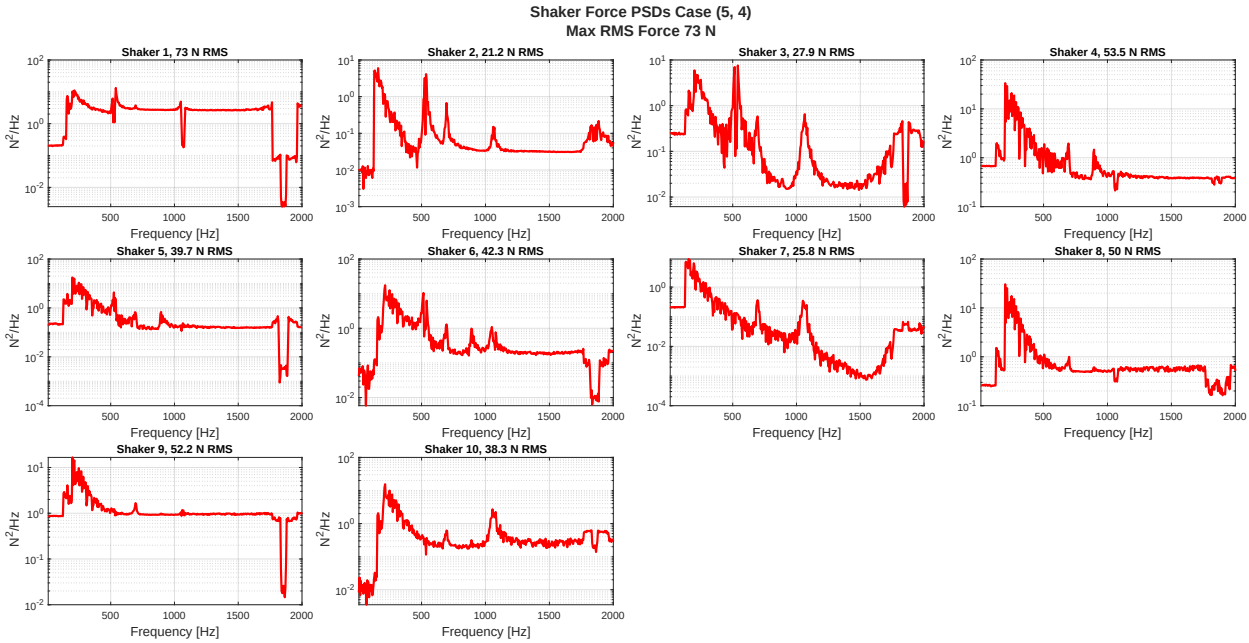


Figure 218: Shaker Forces, Noise, with CN, Case (5,4)

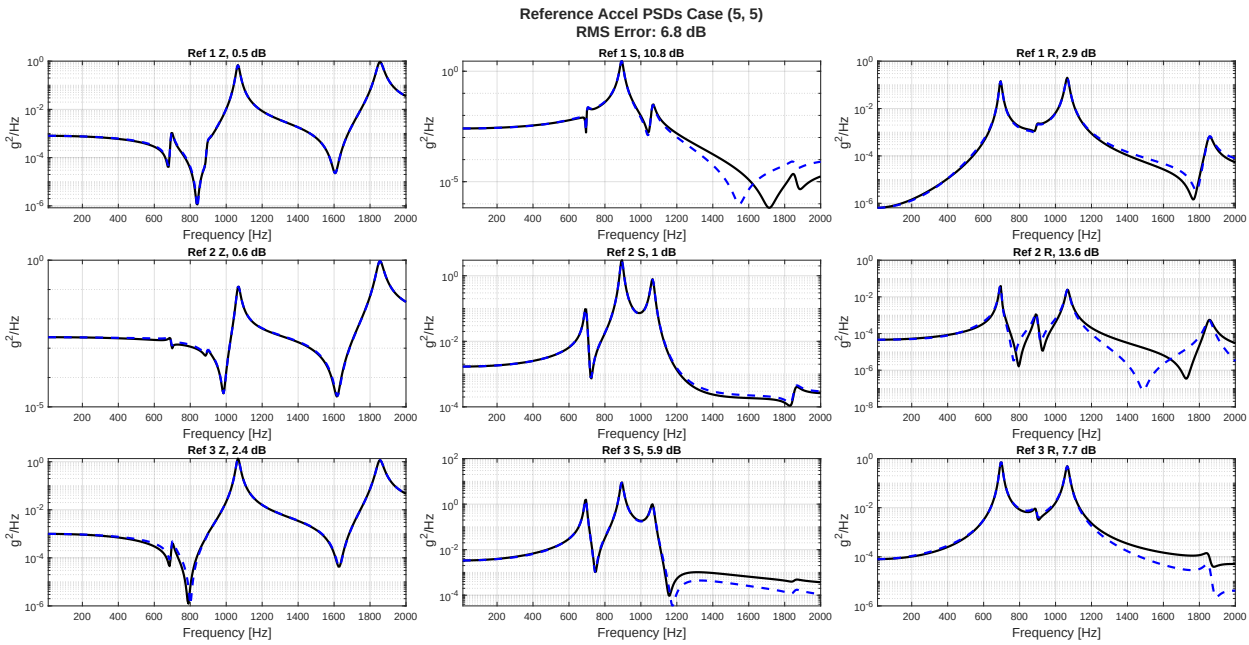


Figure 219: Reference Accels, No Noise, Case (5,5)

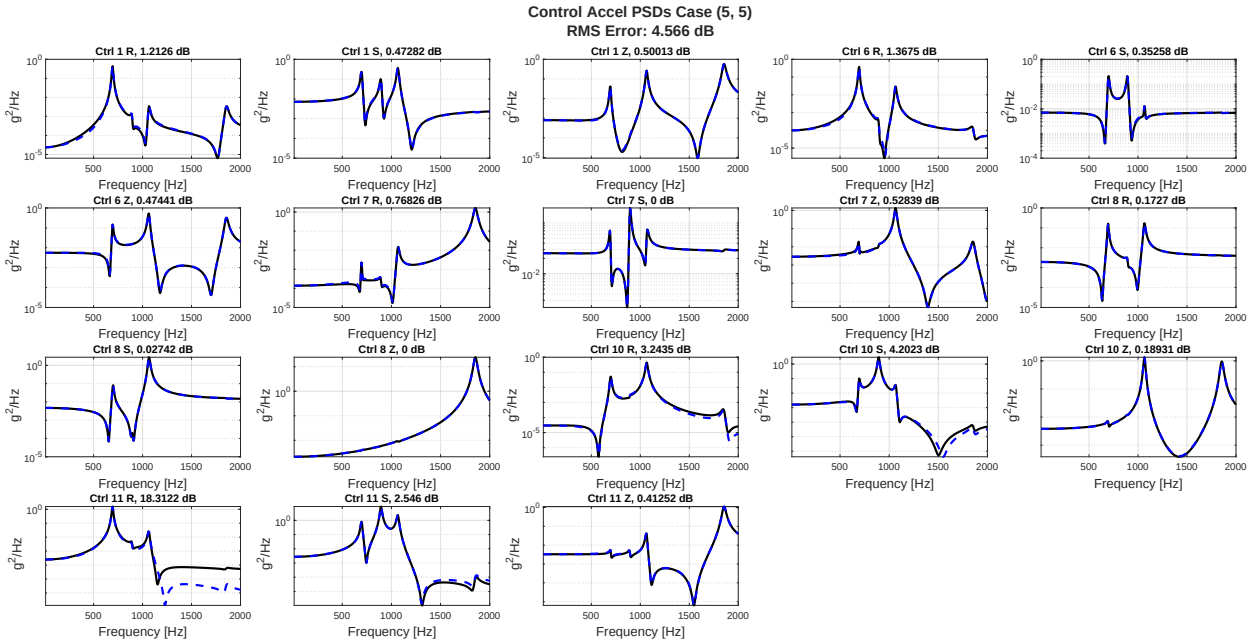


Figure 220: Control Accels, No Noise, Case (5,5)

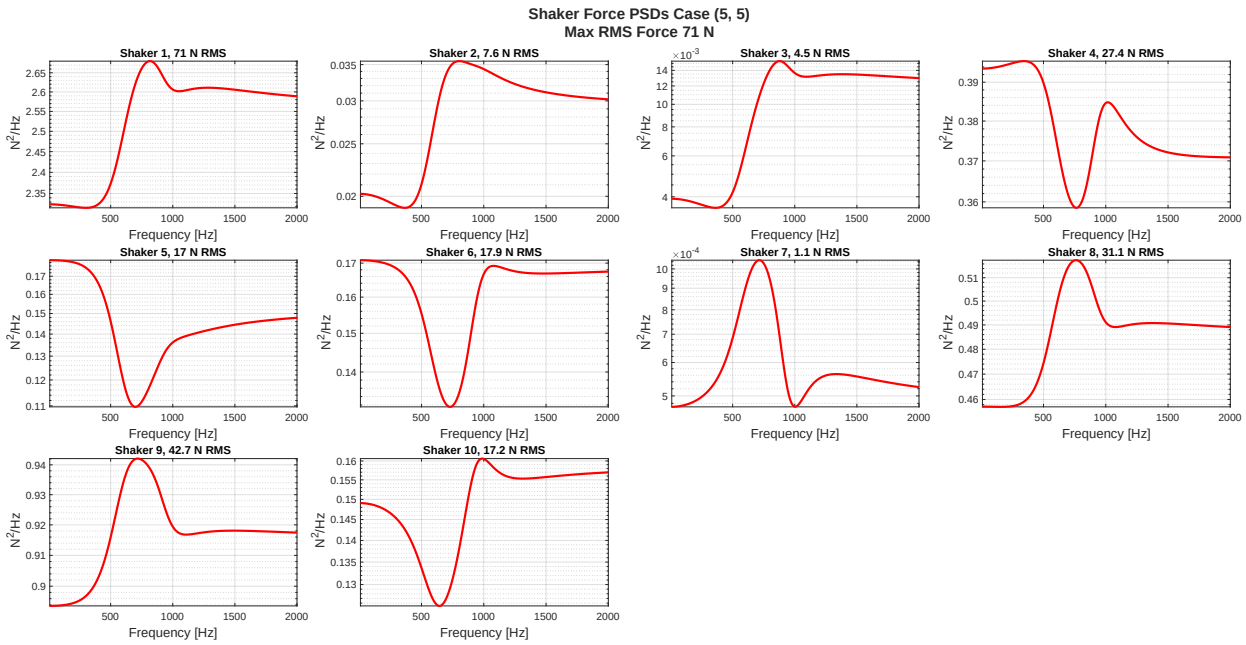


Figure 221: Shaker Forces, No Noise, Case (5,5)

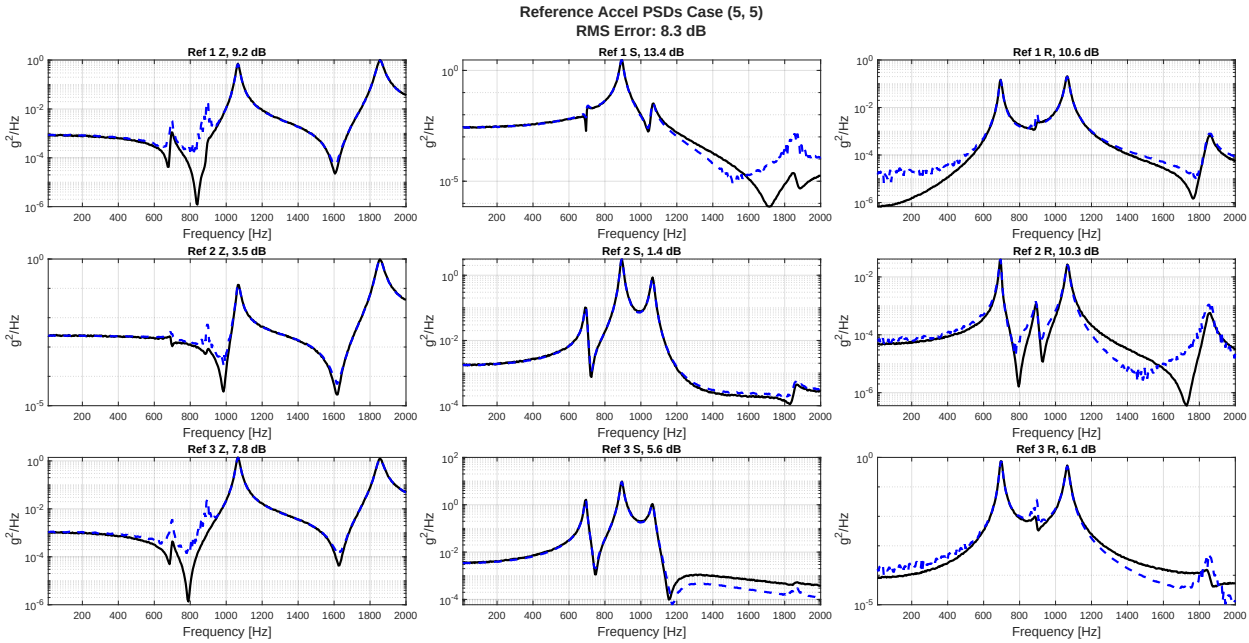


Figure 222: Reference Accels, Noise, No CN, Case (5,5)

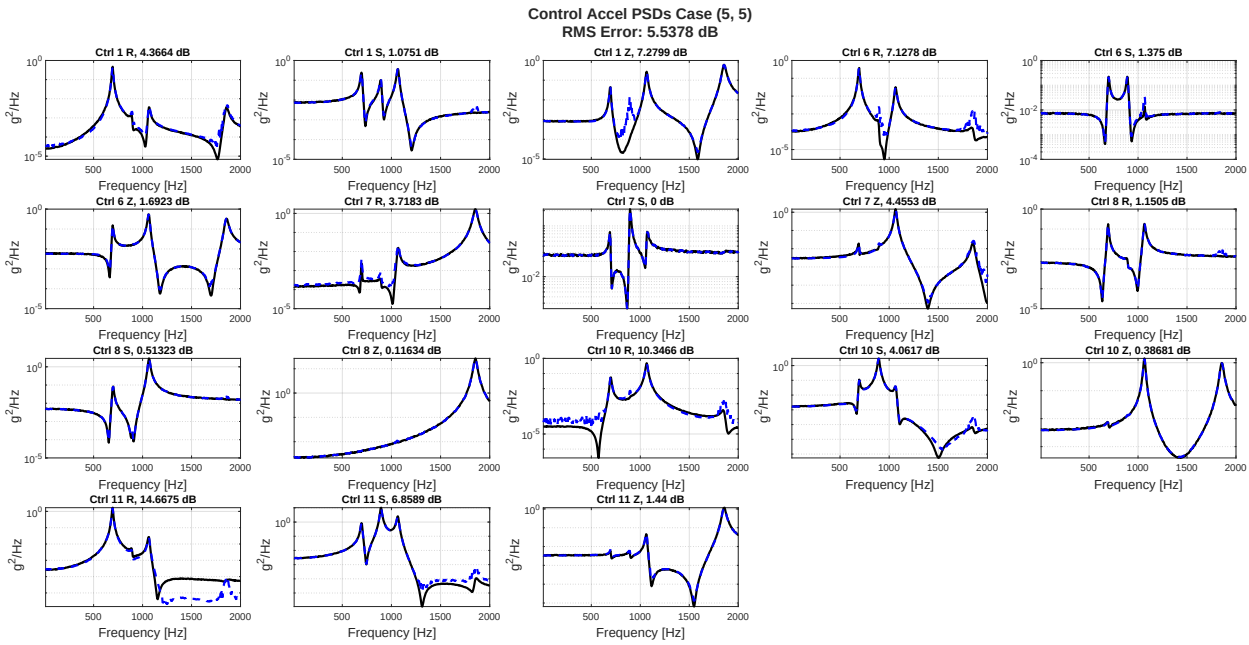


Figure 223: Control Accels, Noise, No CN, Case (5,5)

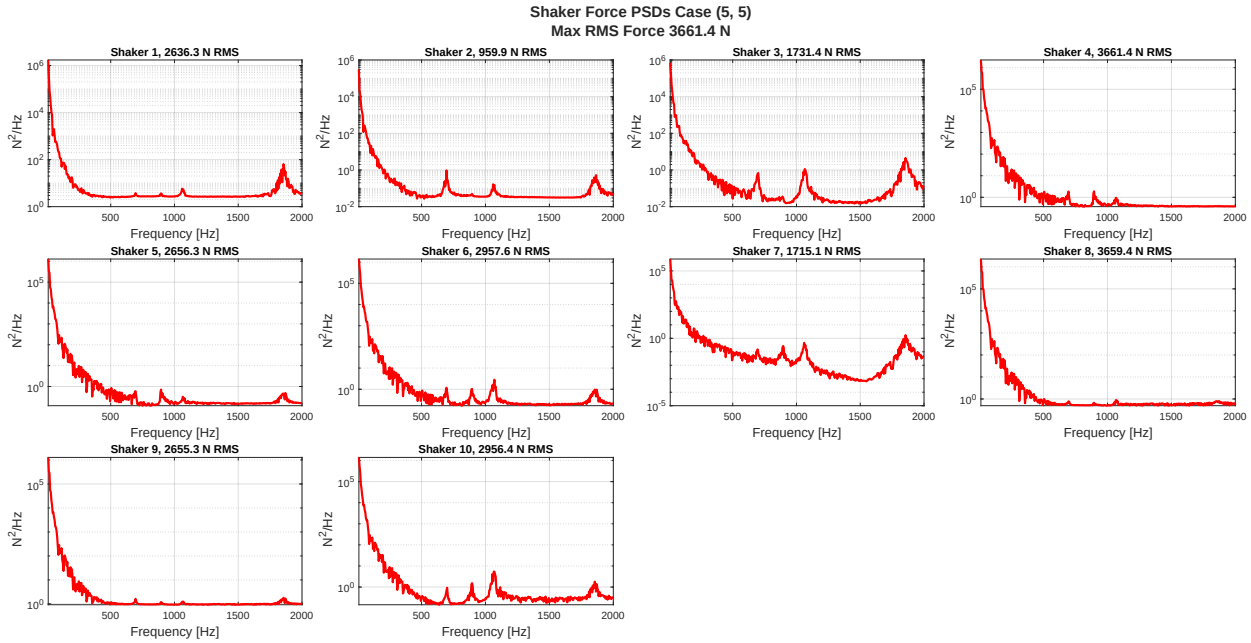


Figure 224: Shaker Forces, Noise, No CN, Case (5,5)

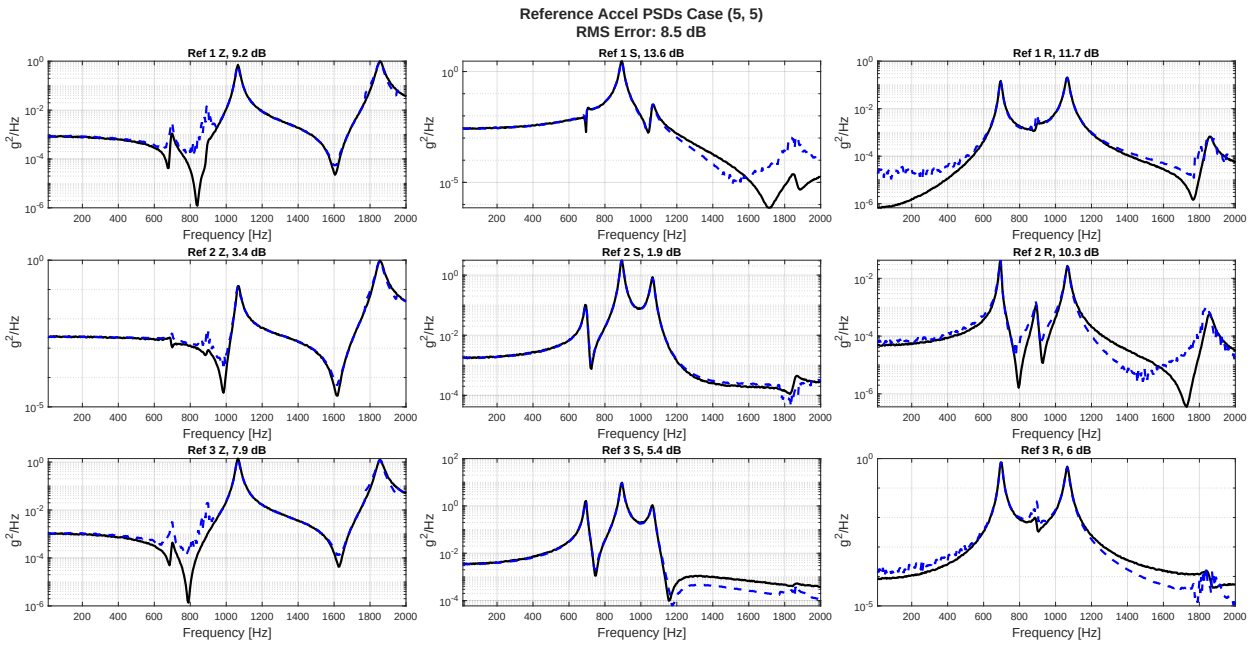


Figure 225: Reference Accels, Noise, with CN, Case (5,5)

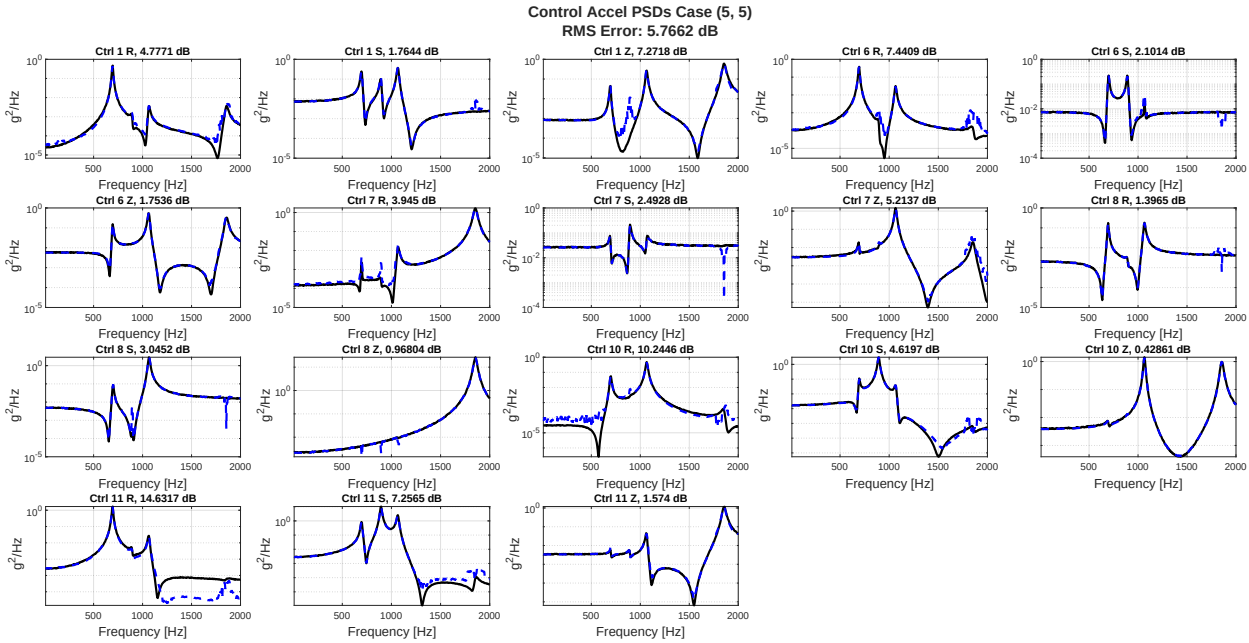


Figure 226: Control Accels, Noise, with CN, Case (5,5)

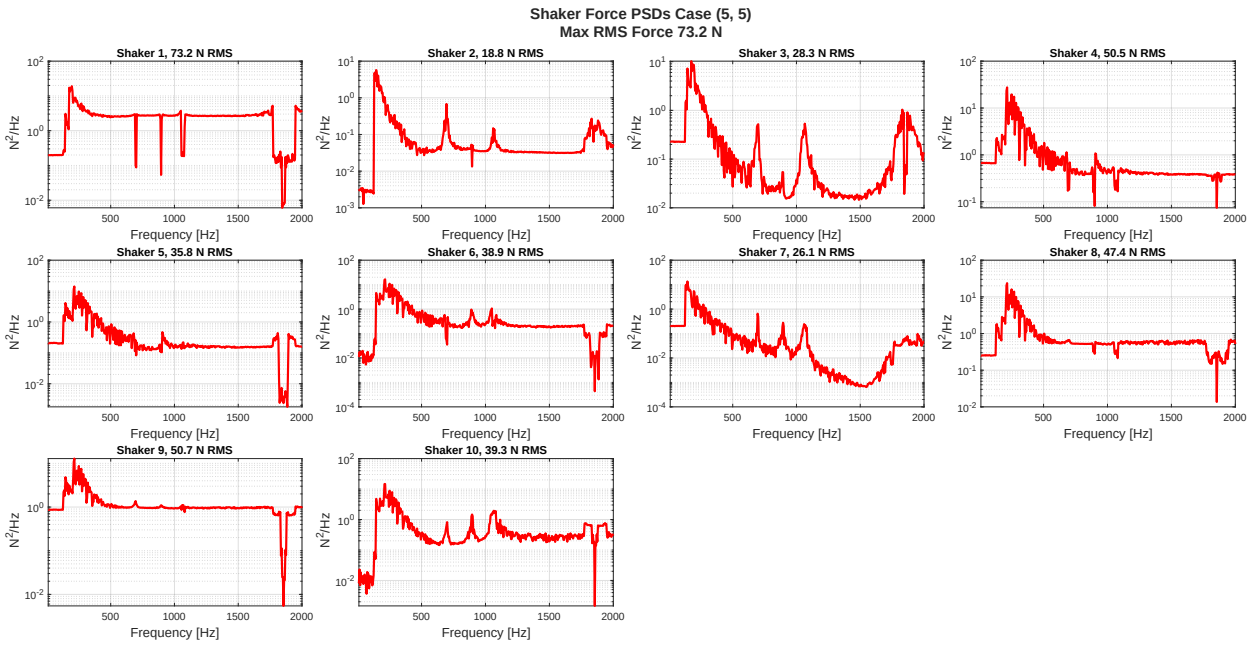


Figure 227: Shaker Forces, Noise, with CN, Case (5,5)

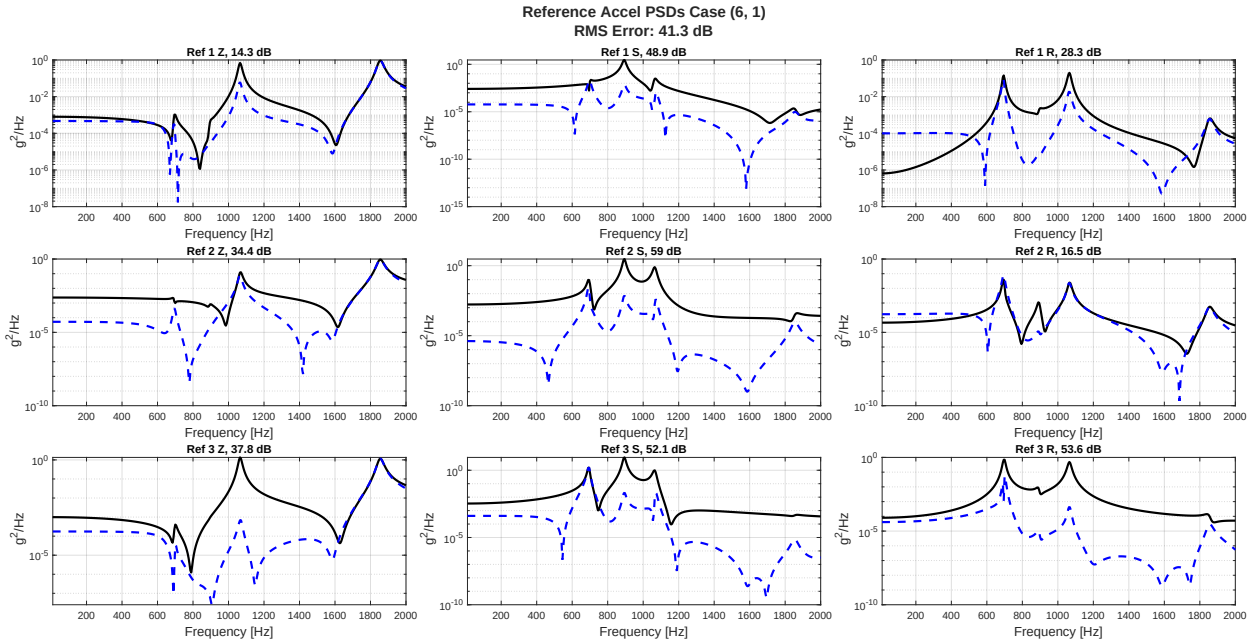


Figure 228: Reference Accels, No Noise, Case (6,1)

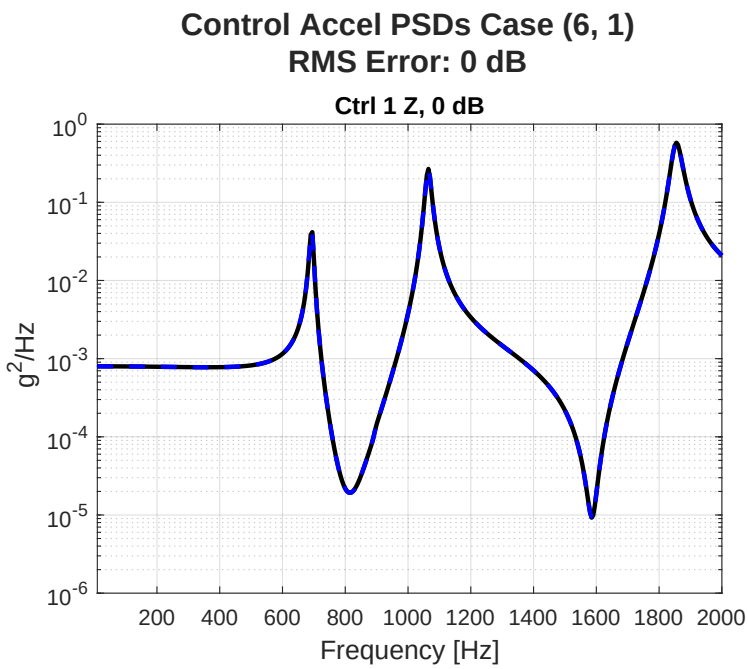


Figure 229: Control Accels, No Noise, Case (6,1)

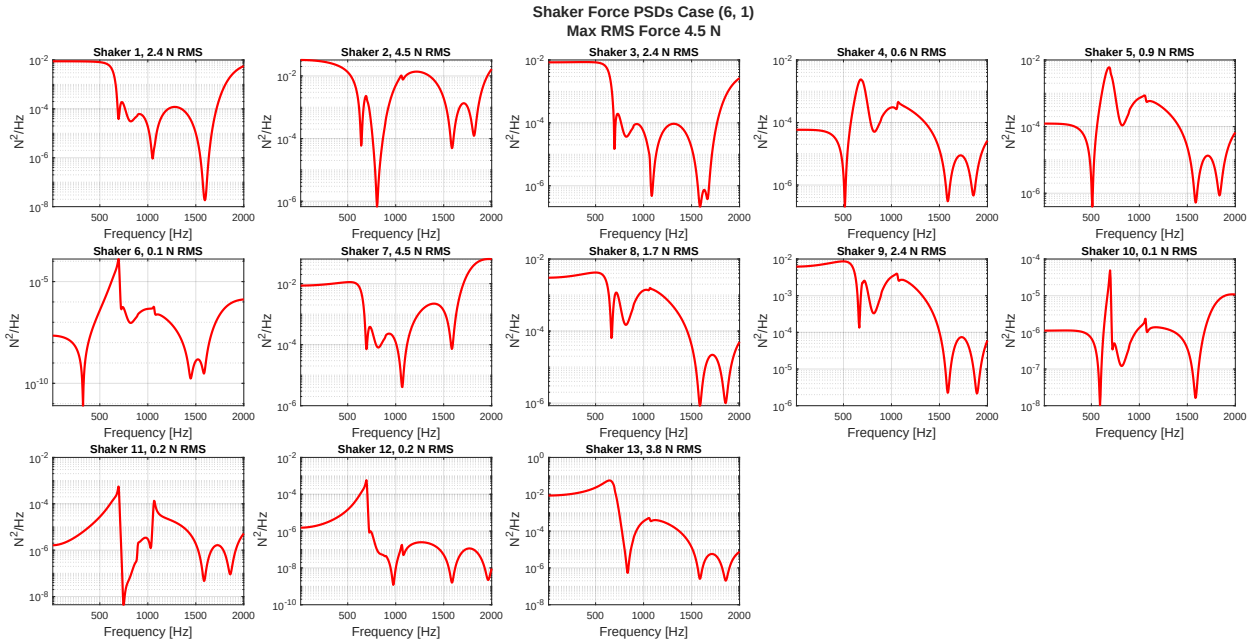


Figure 230: Shaker Forces, No Noise, Case (6,1)

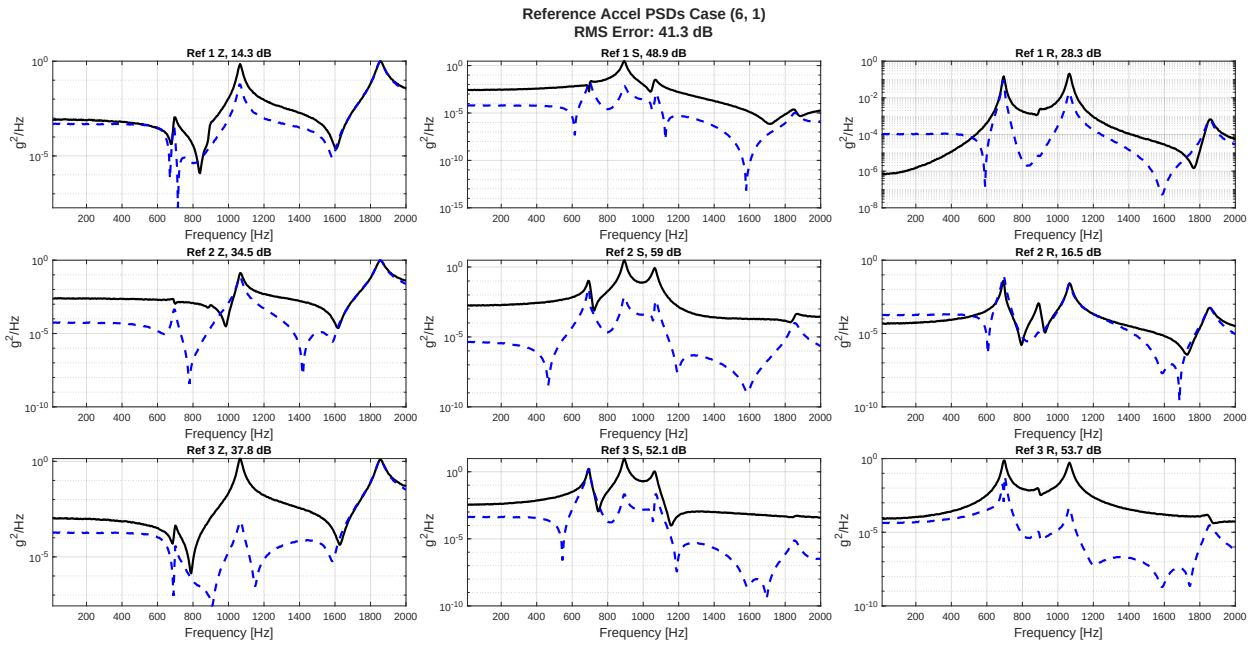


Figure 231: Reference Accels, Noise, No CN, Case (6,1)

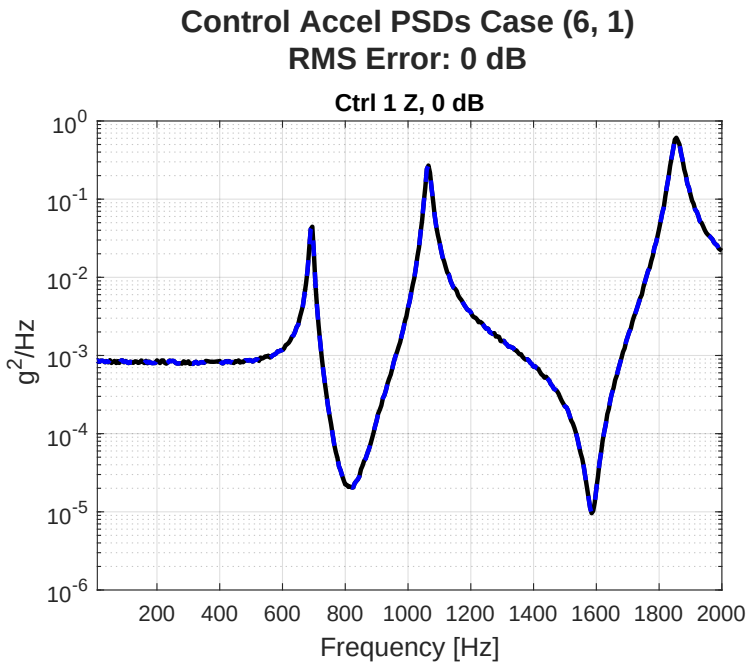


Figure 232: Control Accels, Noise, No CN, Case (6,1)

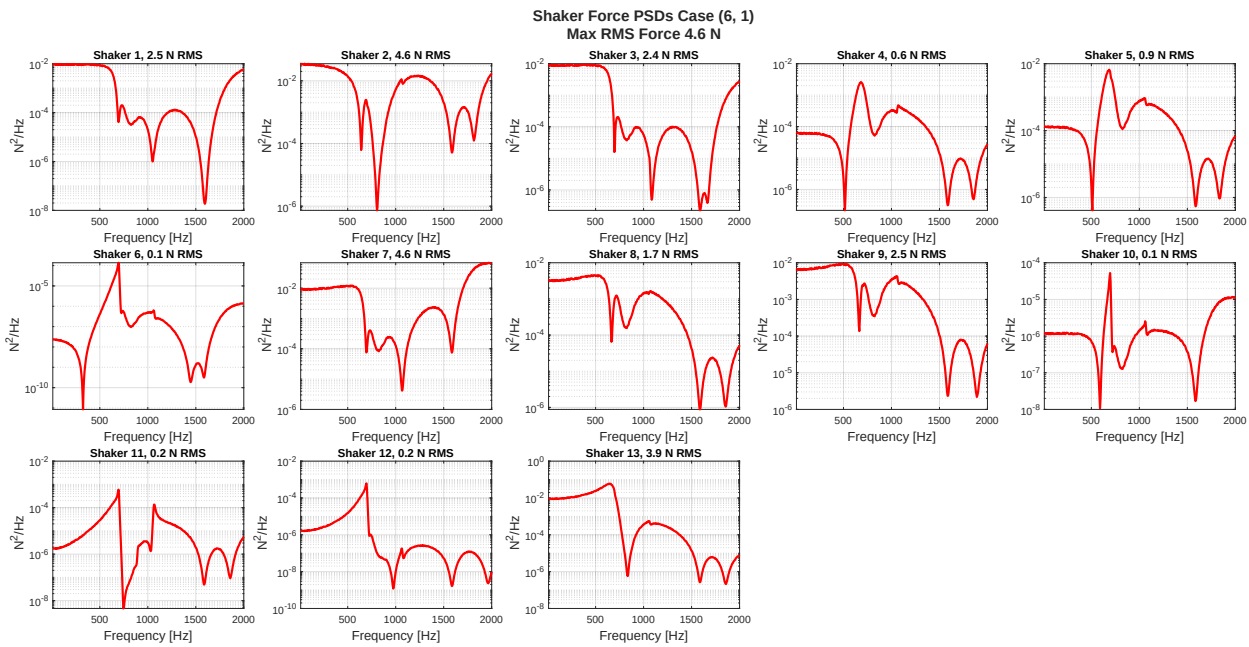


Figure 233: Shaker Forces, Noise, No CN, Case (6,1)

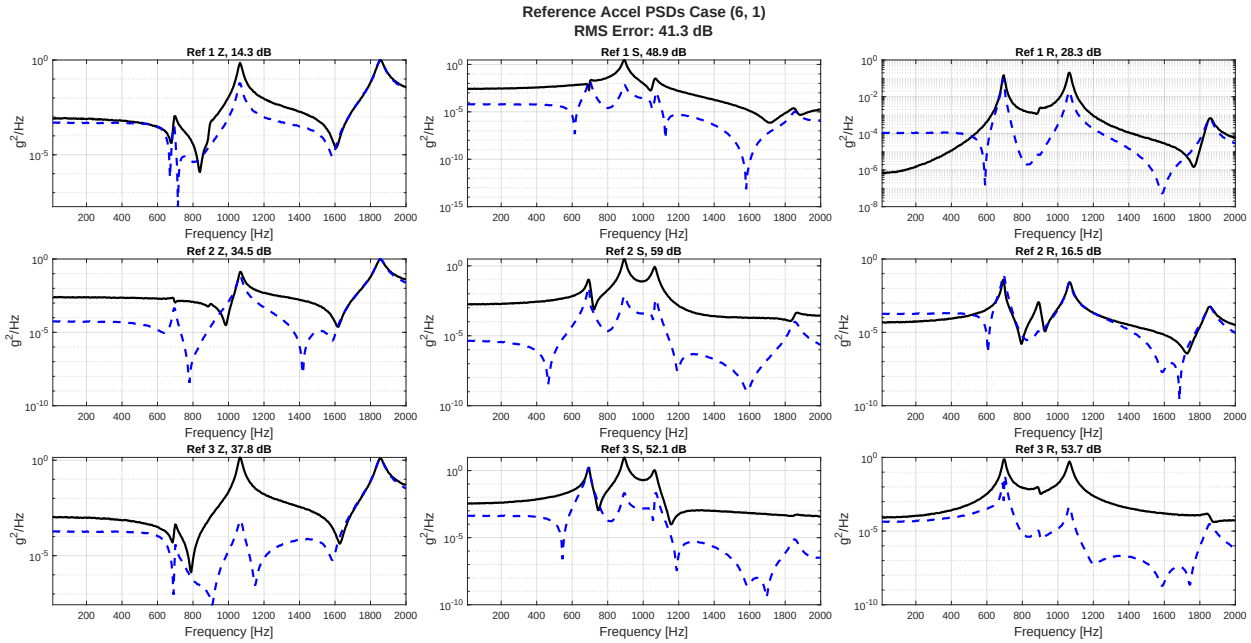


Figure 234: Reference Accels, Noise, with CN, Case (6,1)

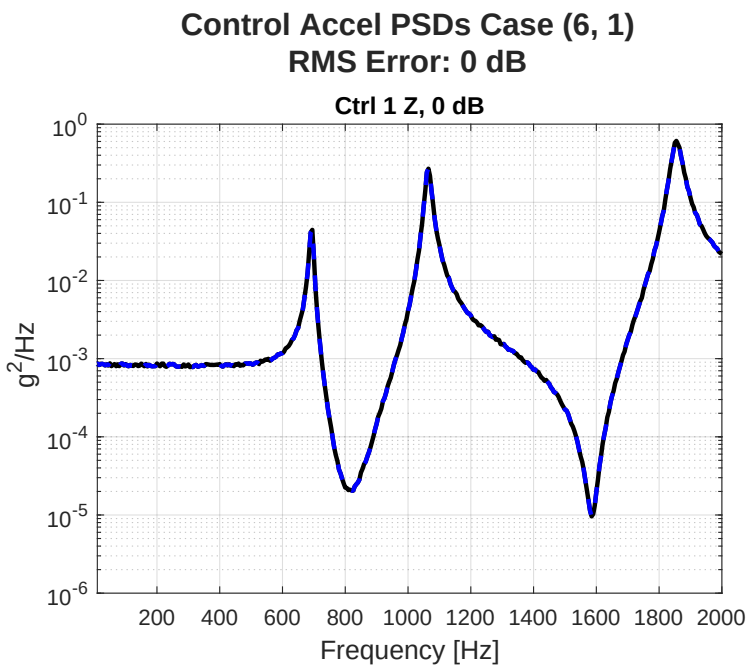


Figure 235: Control Accels, Noise, with CN, Case (6,1)

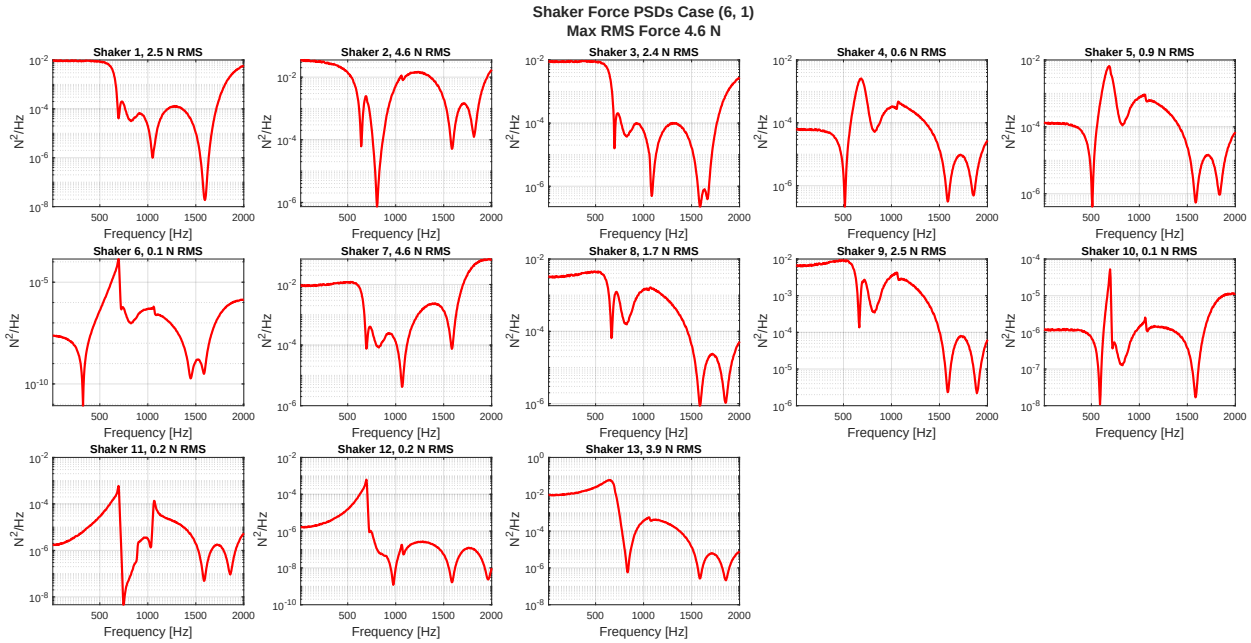


Figure 236: Shaker Forces, Noise, with CN, Case (6,1)

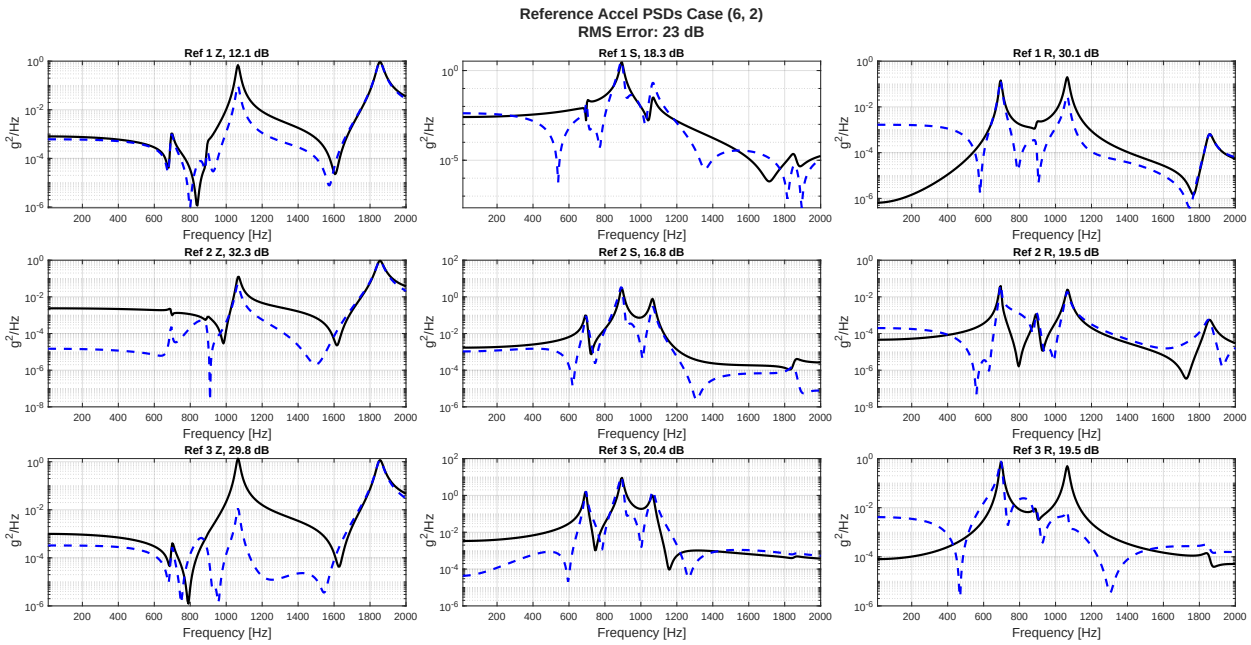


Figure 237: Reference Accels, No Noise, Case (6,2)

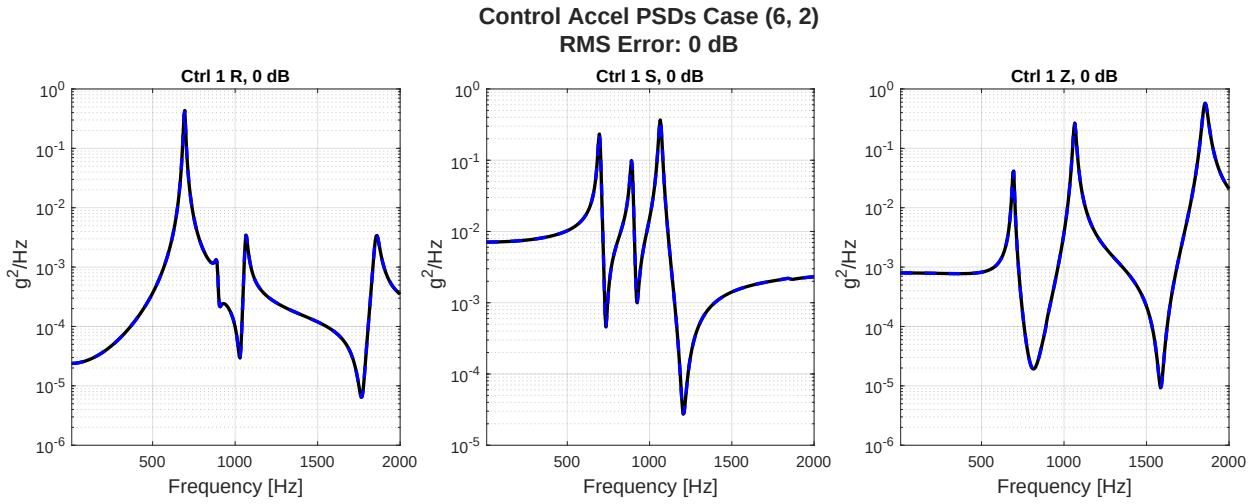


Figure 238: Control Accels, No Noise, Case (6,2)

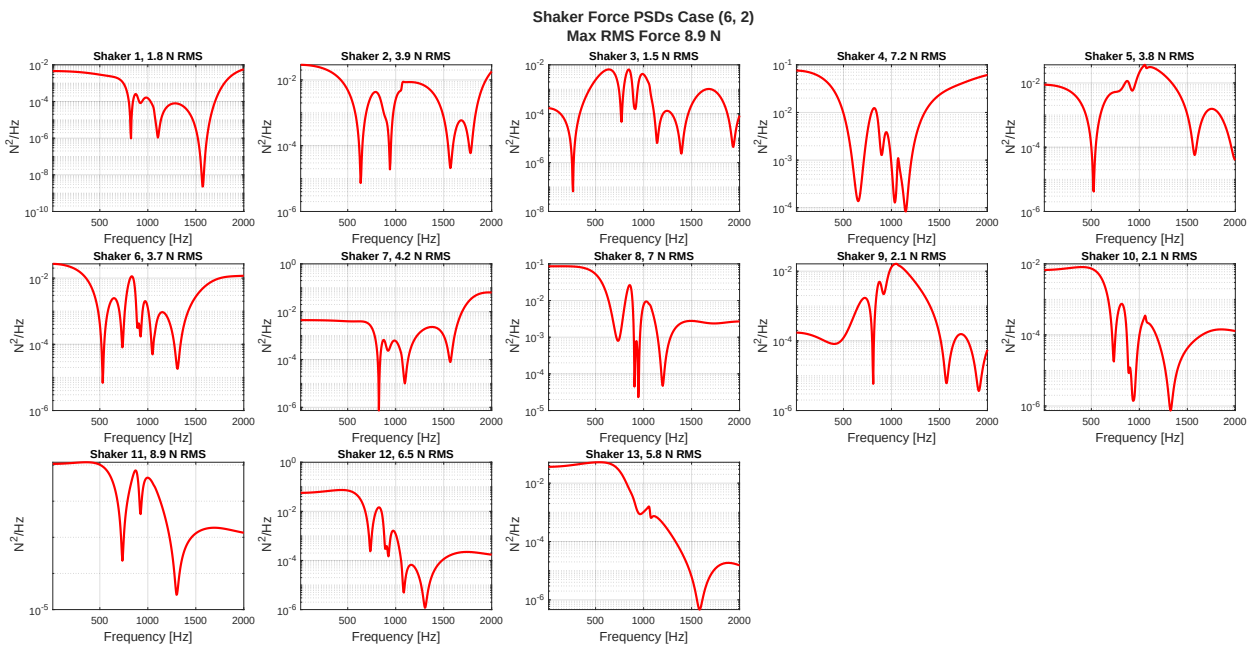


Figure 239: Shaker Forces, No Noise, Case (6,2)

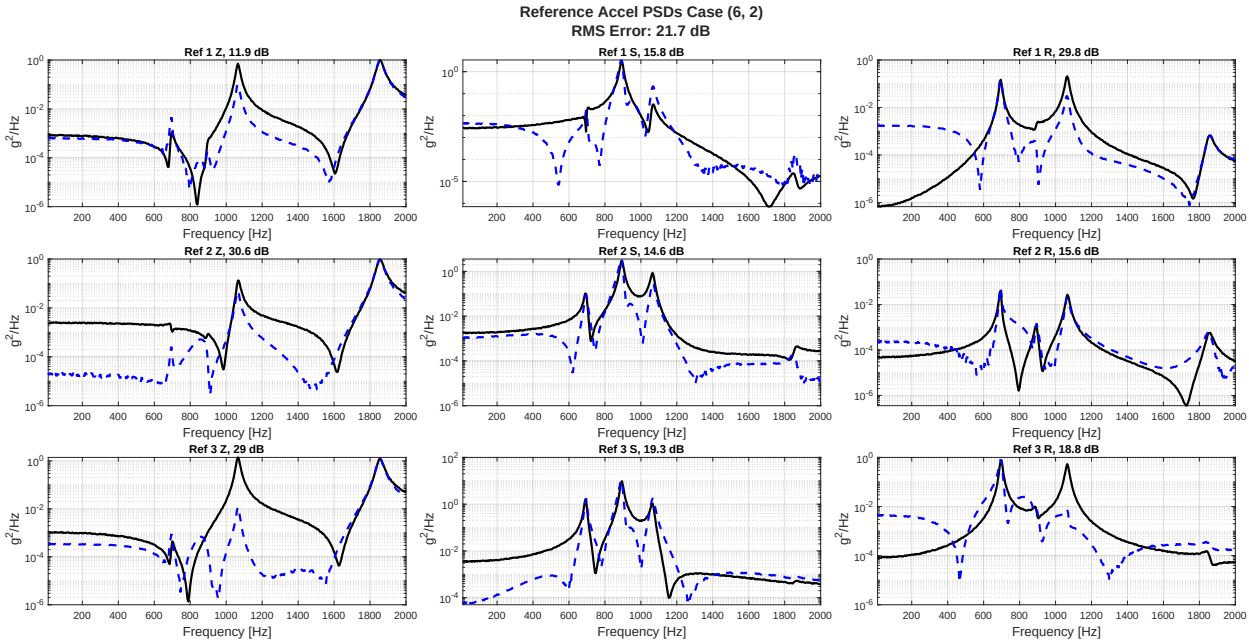


Figure 240: Reference Accels, Noise, No CN, Case (6,2)

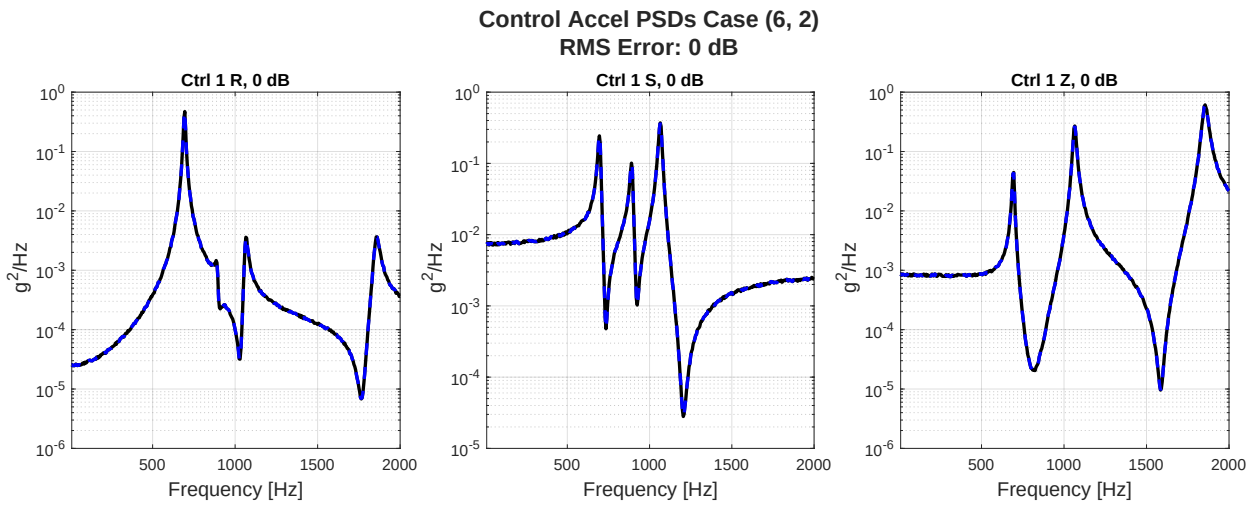


Figure 241: Control Accels, Noise, No CN, Case (6,2)

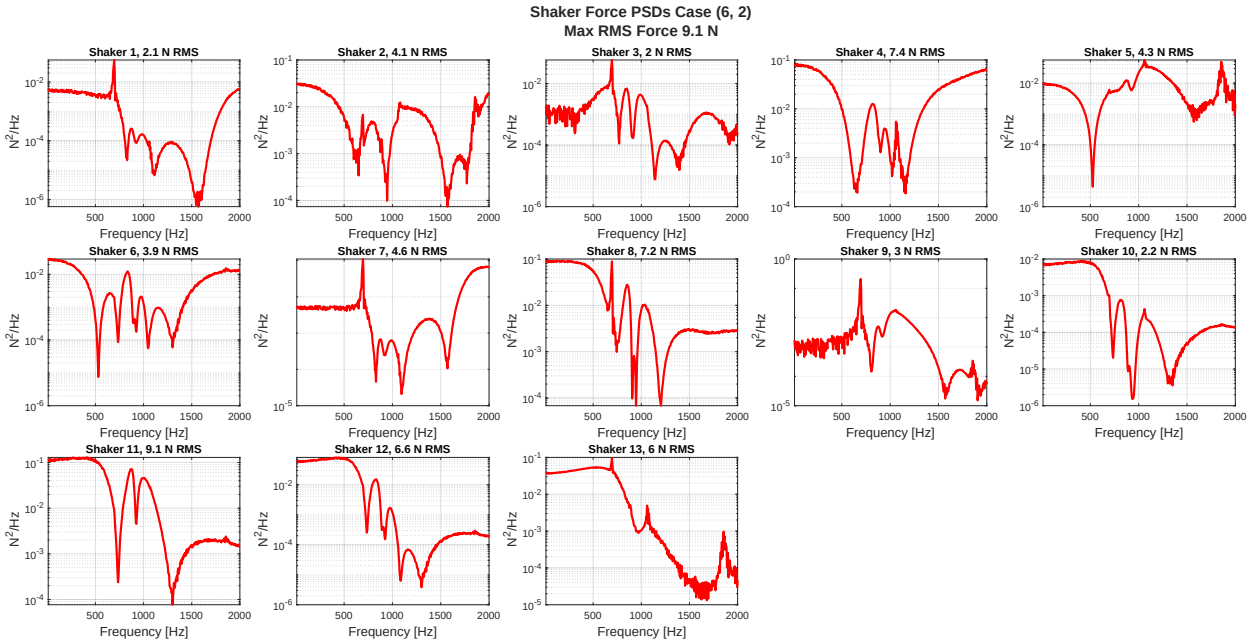


Figure 242: Shaker Forces, Noise, No CN, Case (6,2)

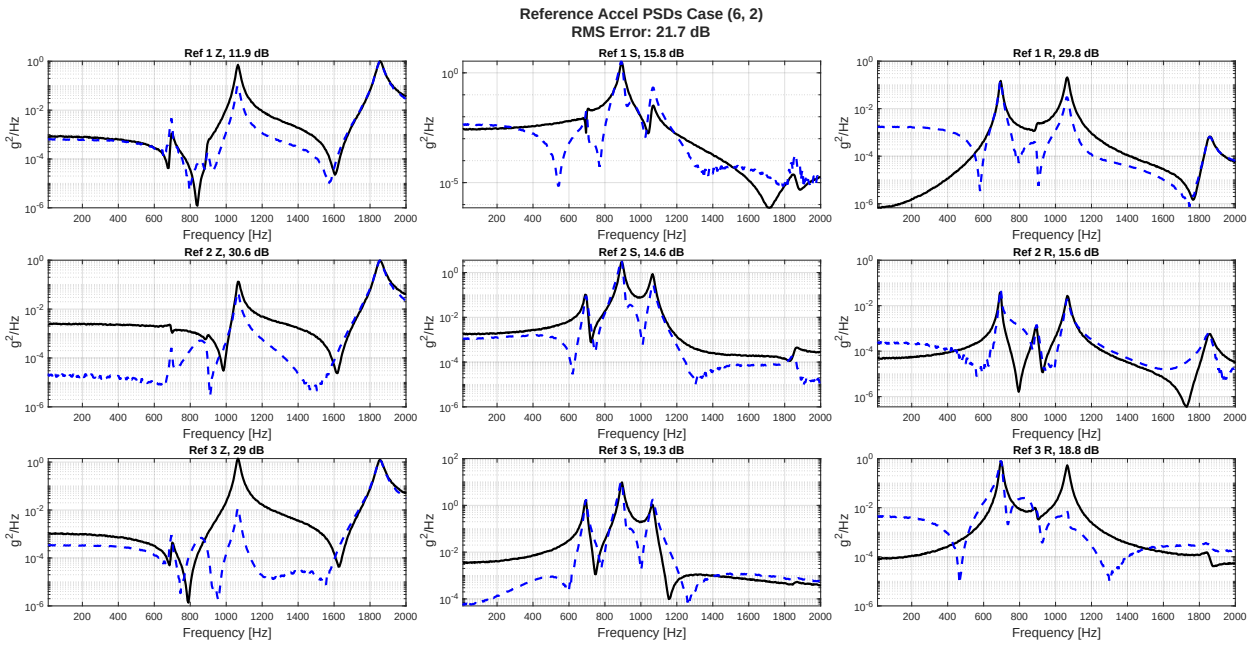


Figure 243: Reference Accels, Noise, with CN, Case (6,2)

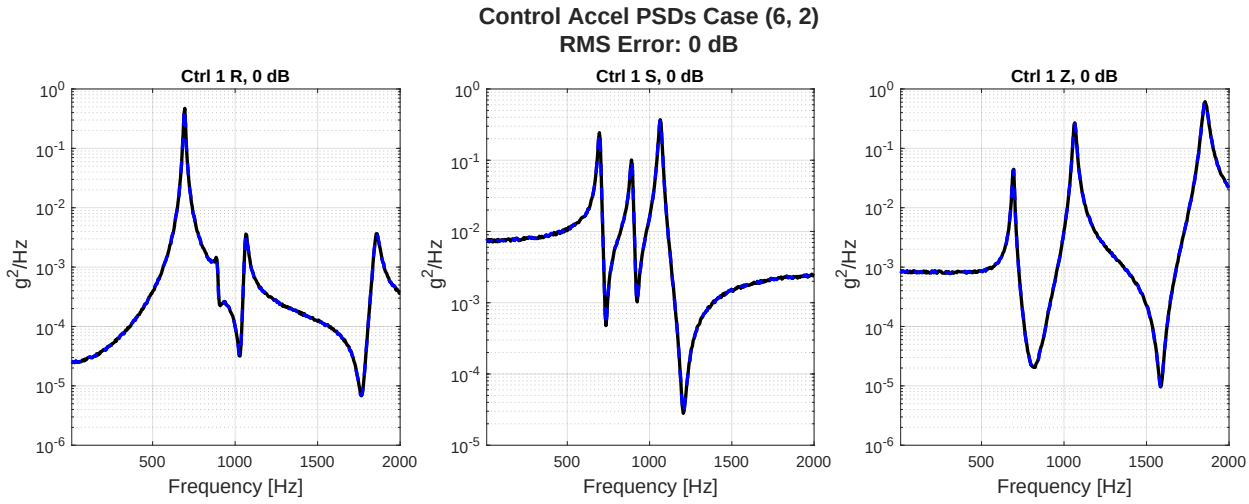


Figure 244: Control Accels, Noise, with CN, Case (6,2)

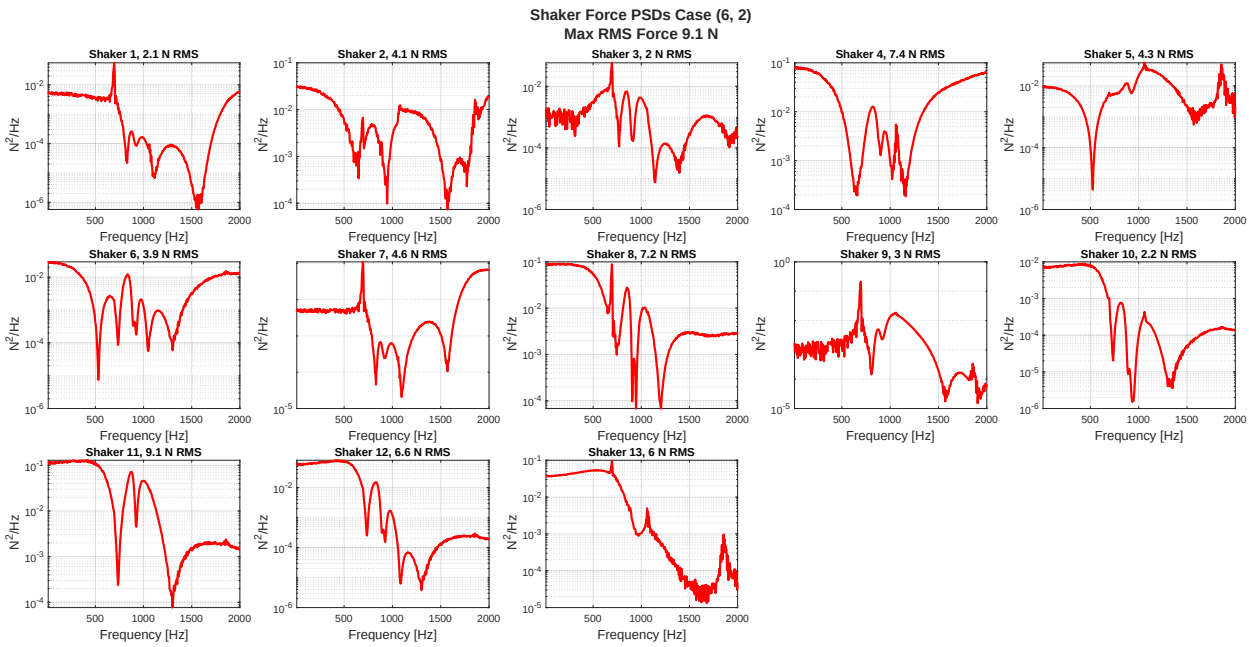


Figure 245: Shaker Forces, Noise, with CN, Case (6,2)

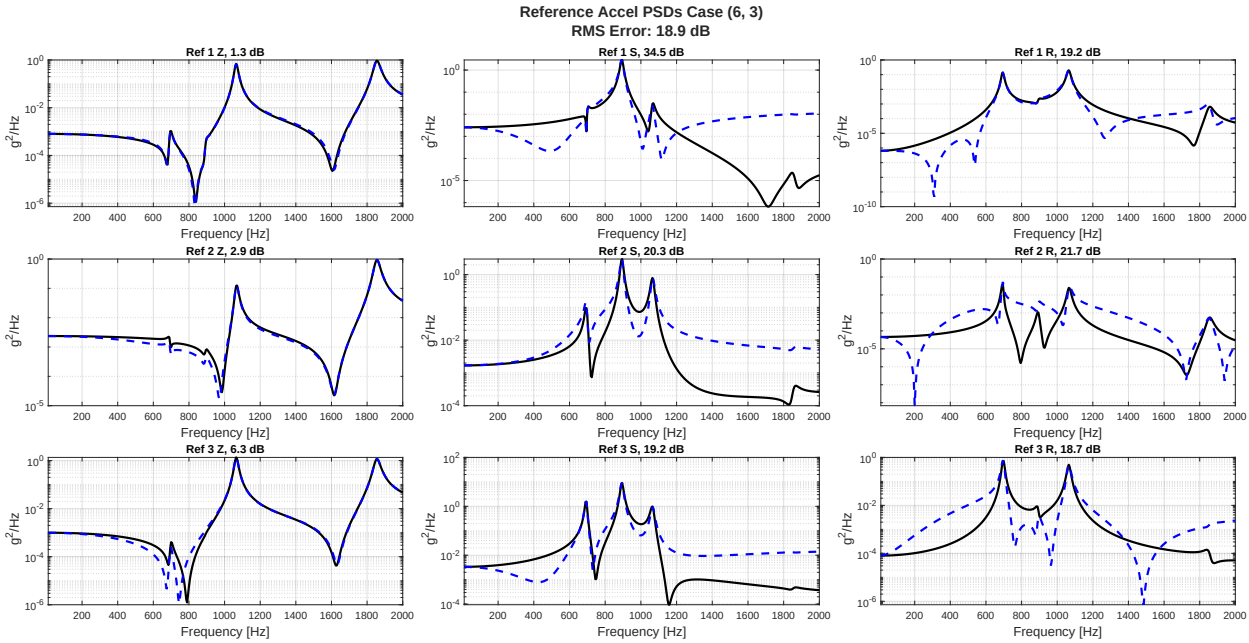


Figure 246: Reference Accels, No Noise, Case (6,3)

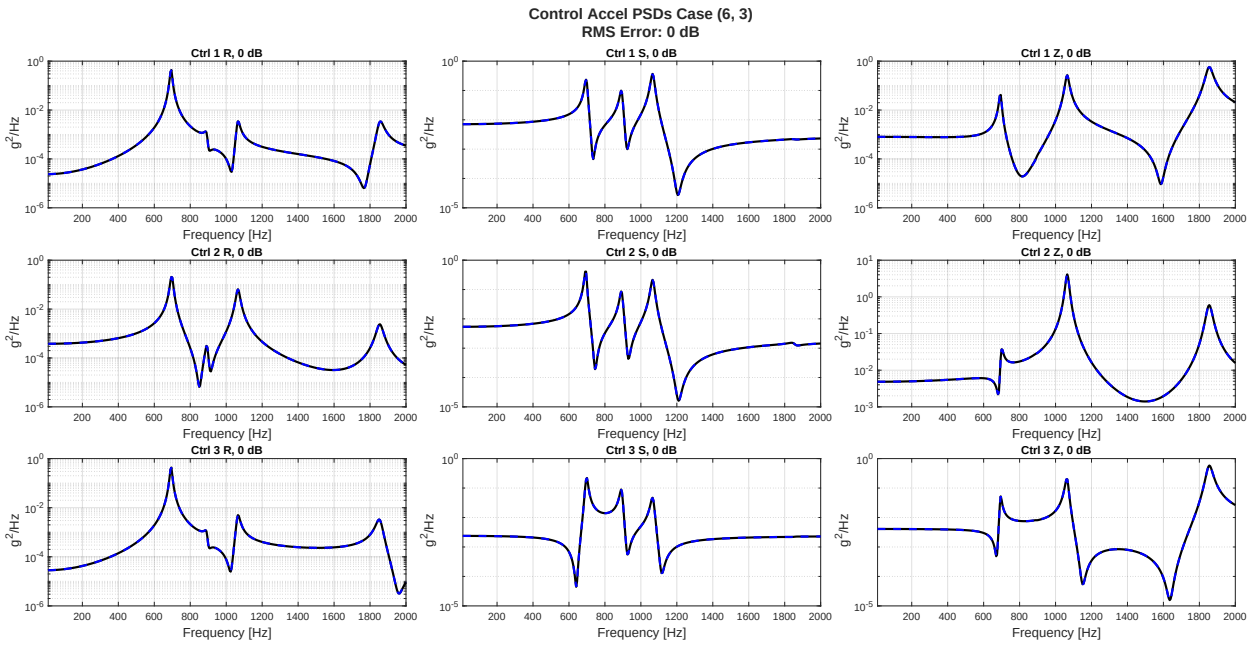


Figure 247: Control Accels, No Noise, Case (6,3)

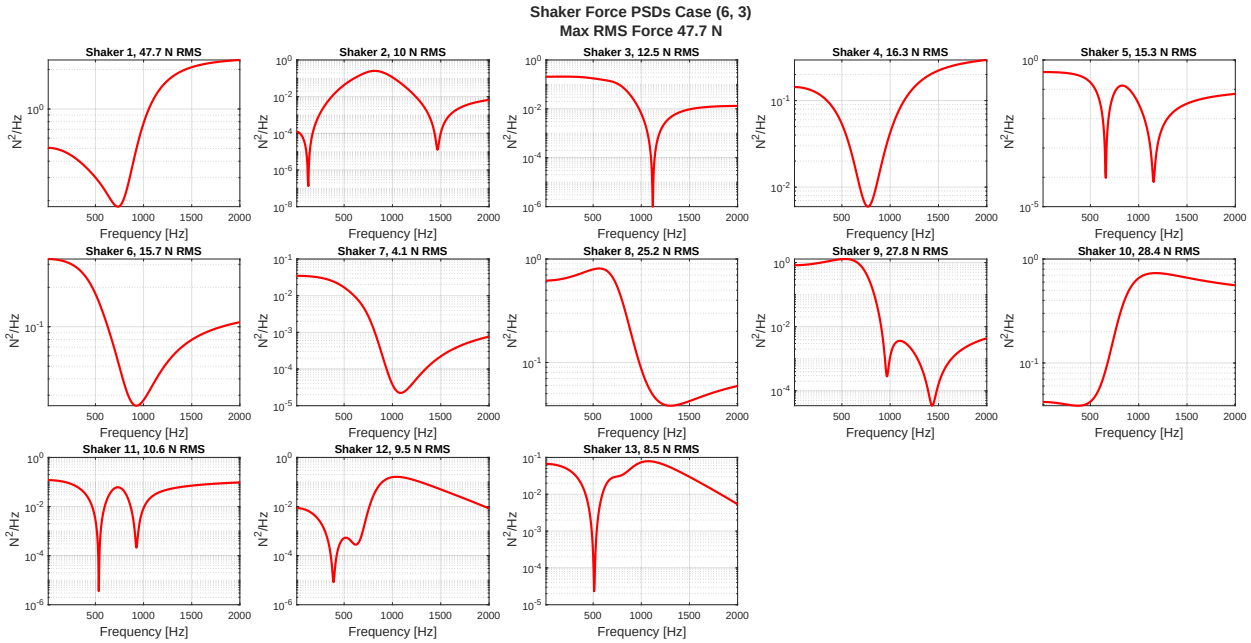


Figure 248: Shaker Forces, No Noise, Case (6,3)

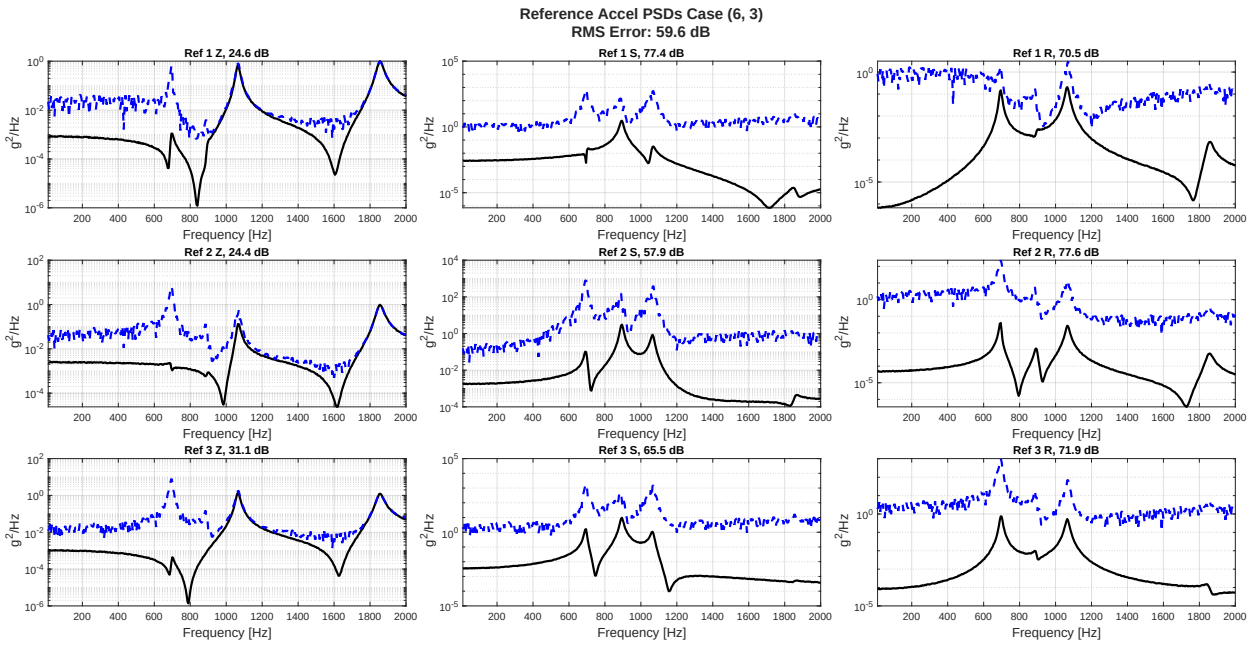


Figure 249: Reference Accels, Noise, No CN, Case (6,3)

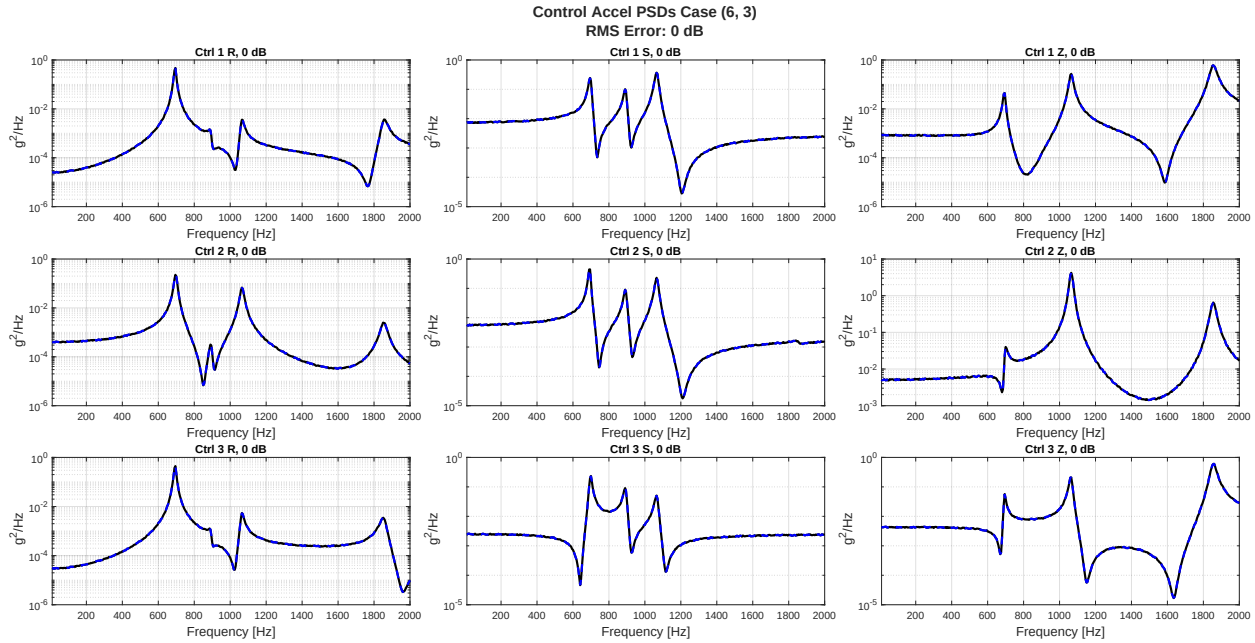


Figure 250: Control Accels, Noise, No CN, Case (6,3)

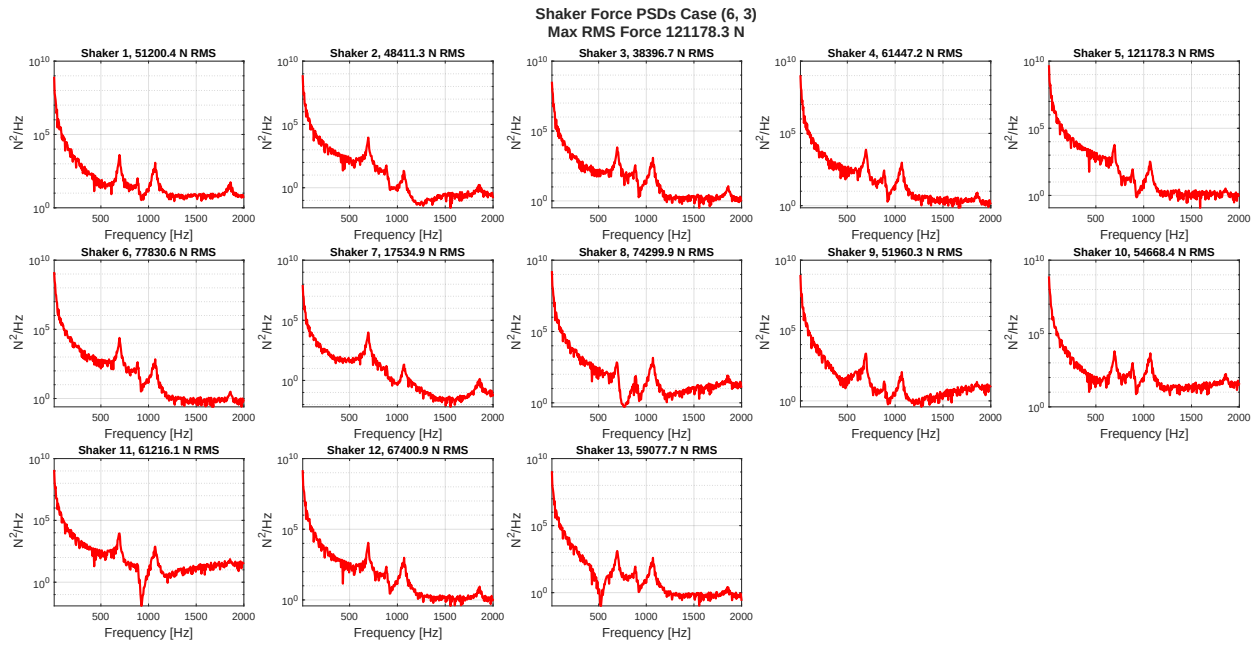


Figure 251: Shaker Forces, Noise, No CN, Case (6,3)

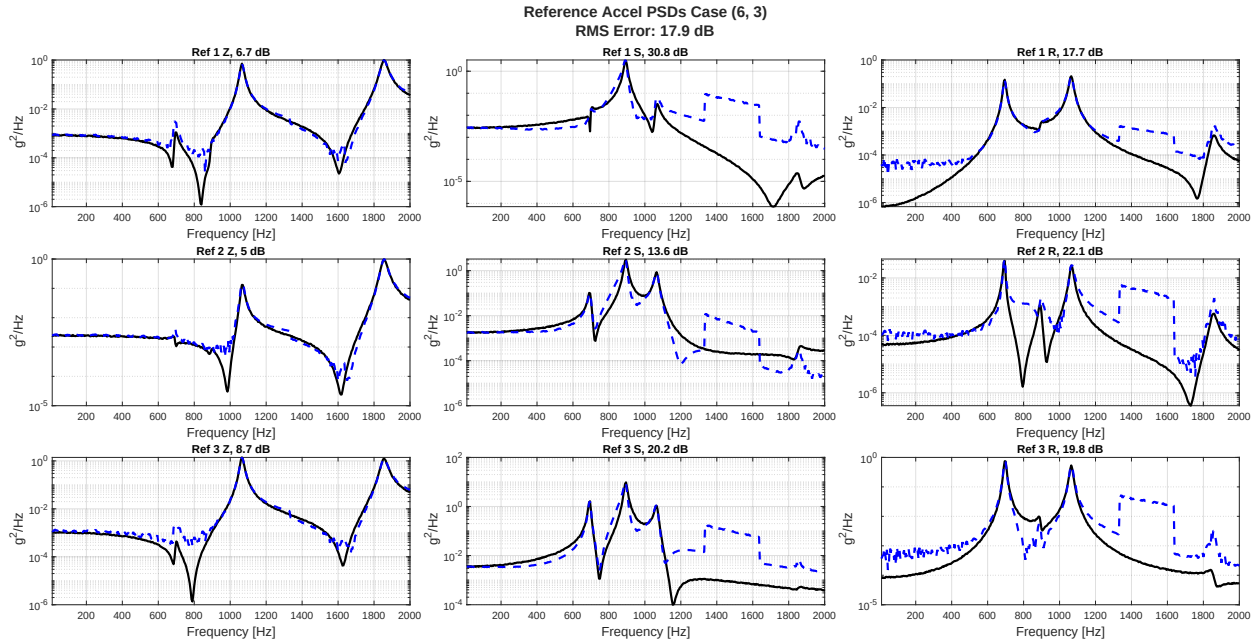


Figure 252: Reference Accels, Noise, with CN, Case (6,3)

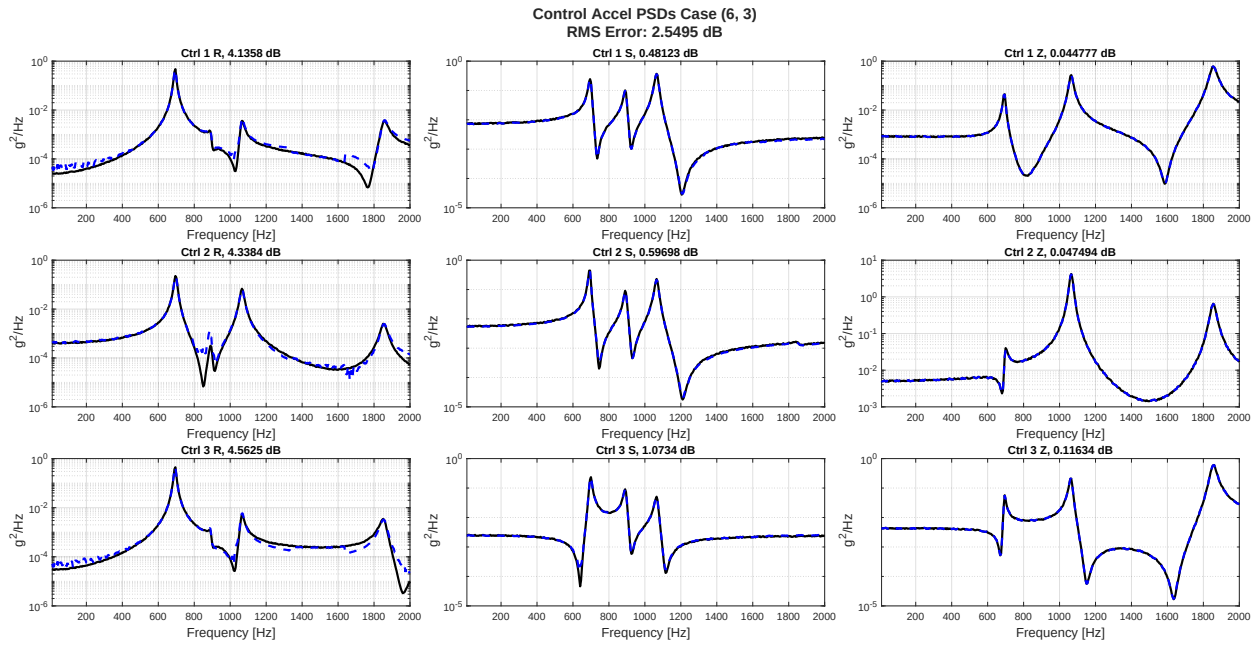


Figure 253: Control Accels, Noise, with CN, Case (6,3)

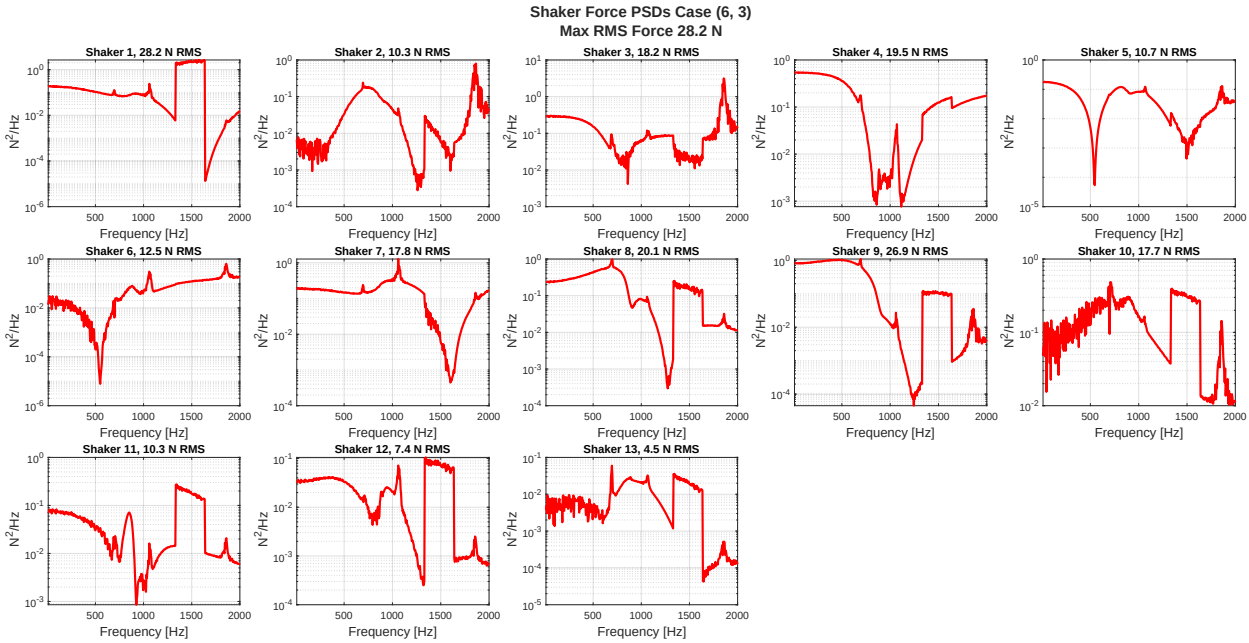


Figure 254: Shaker Forces, Noise, with CN, Case (6,3)

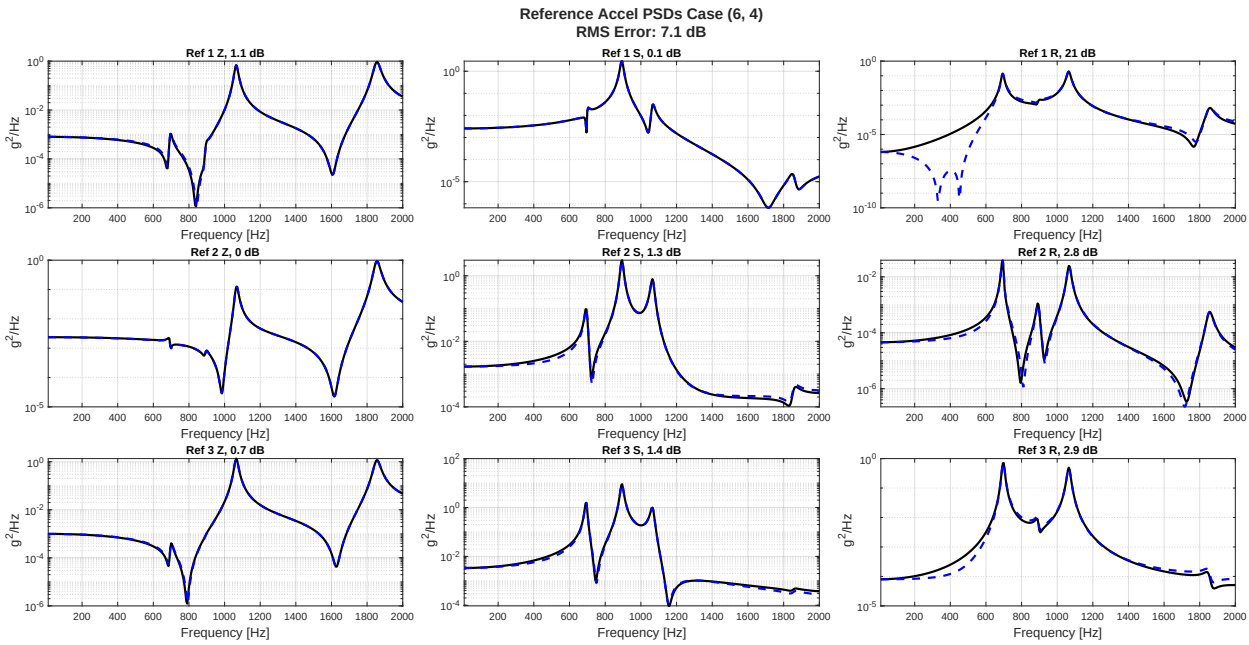


Figure 255: Reference Accels, No Noise, Case (6,4)

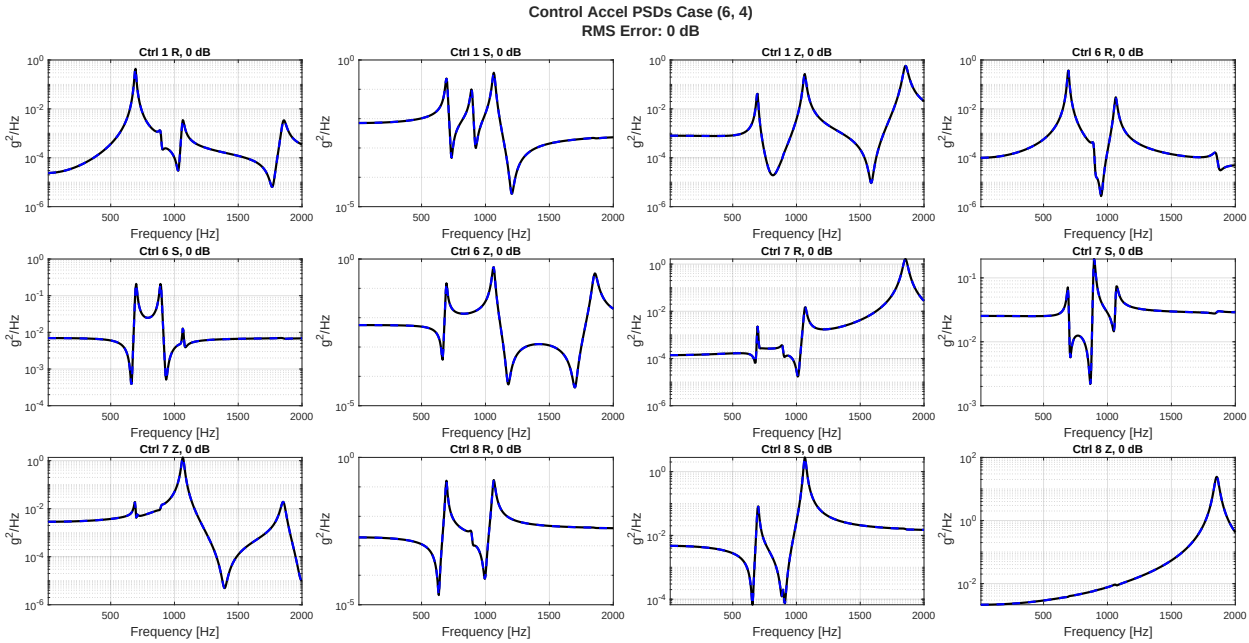


Figure 256: Control Accels, No Noise, Case (6,4)

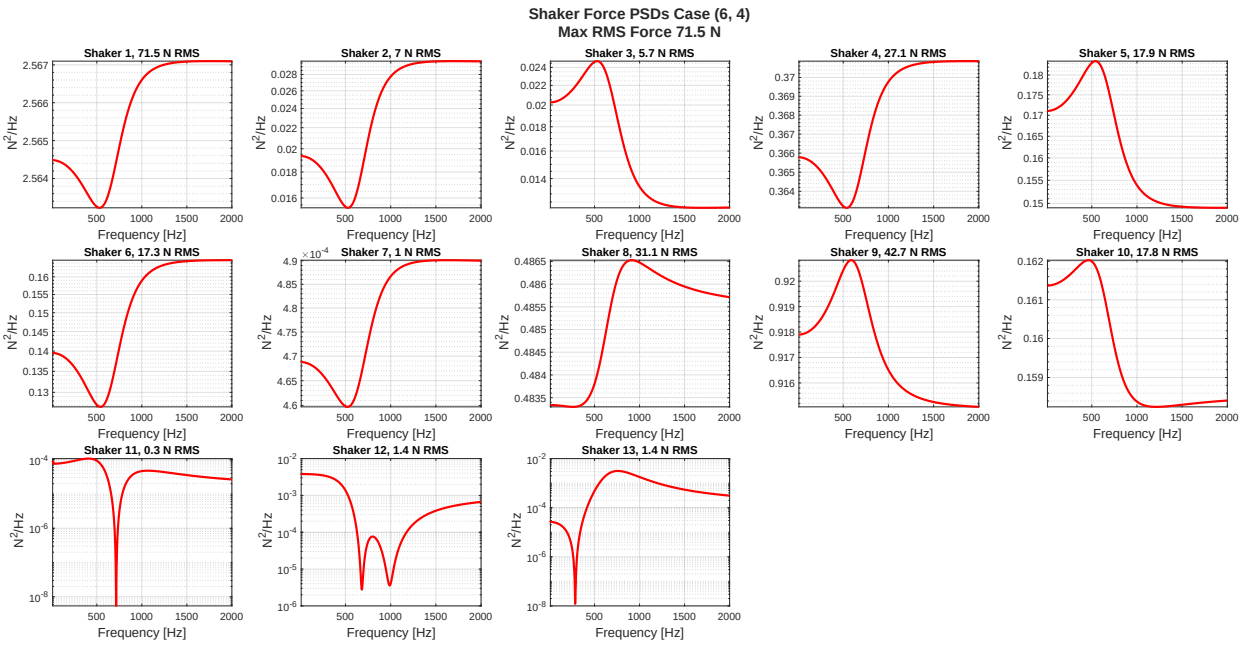


Figure 257: Shaker Forces, No Noise, Case (6,4)

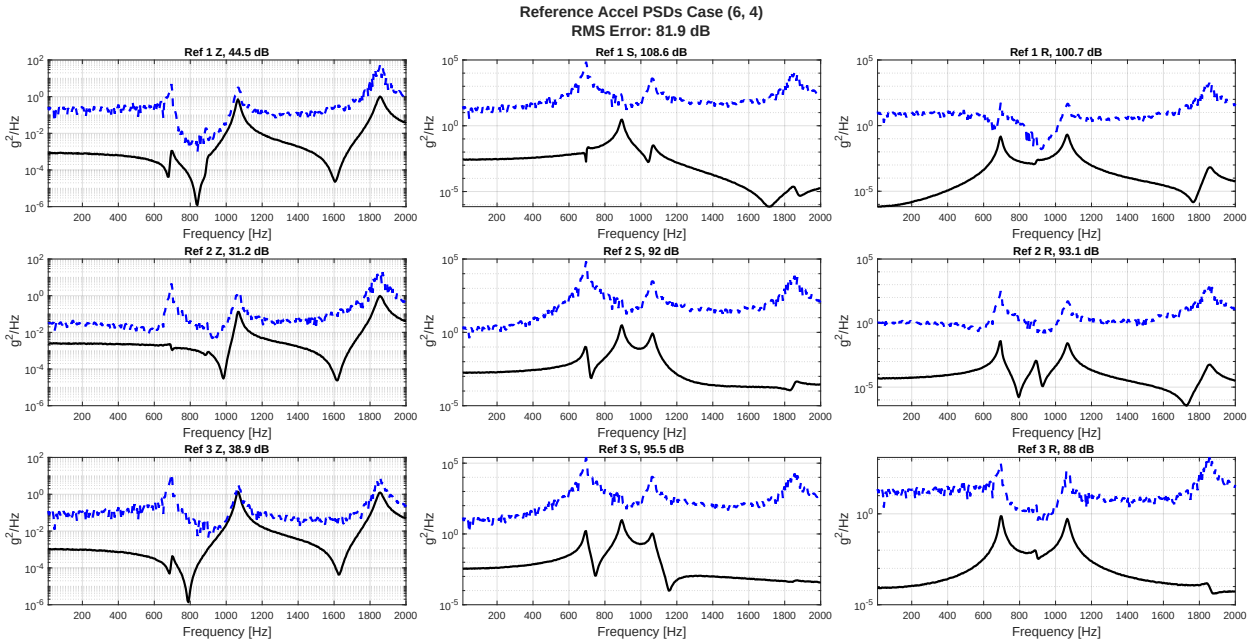


Figure 258: Reference Accels, Noise, No CN, Case (6,4)

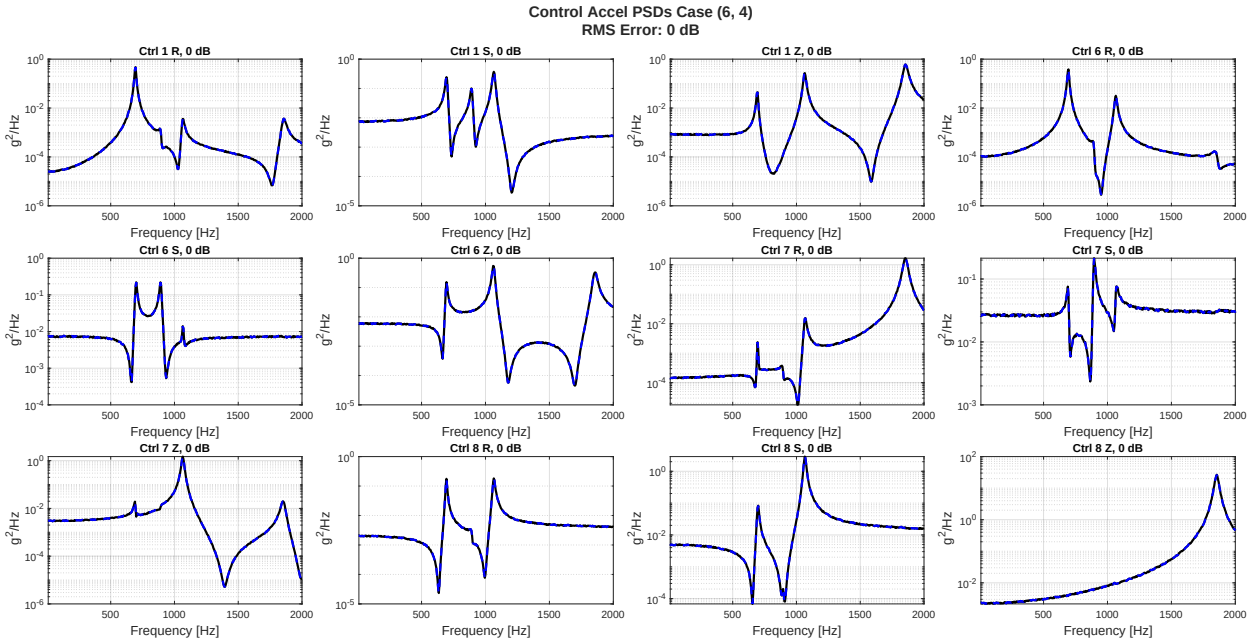


Figure 259: Control Accels, Noise, No CN, Case (6,4)

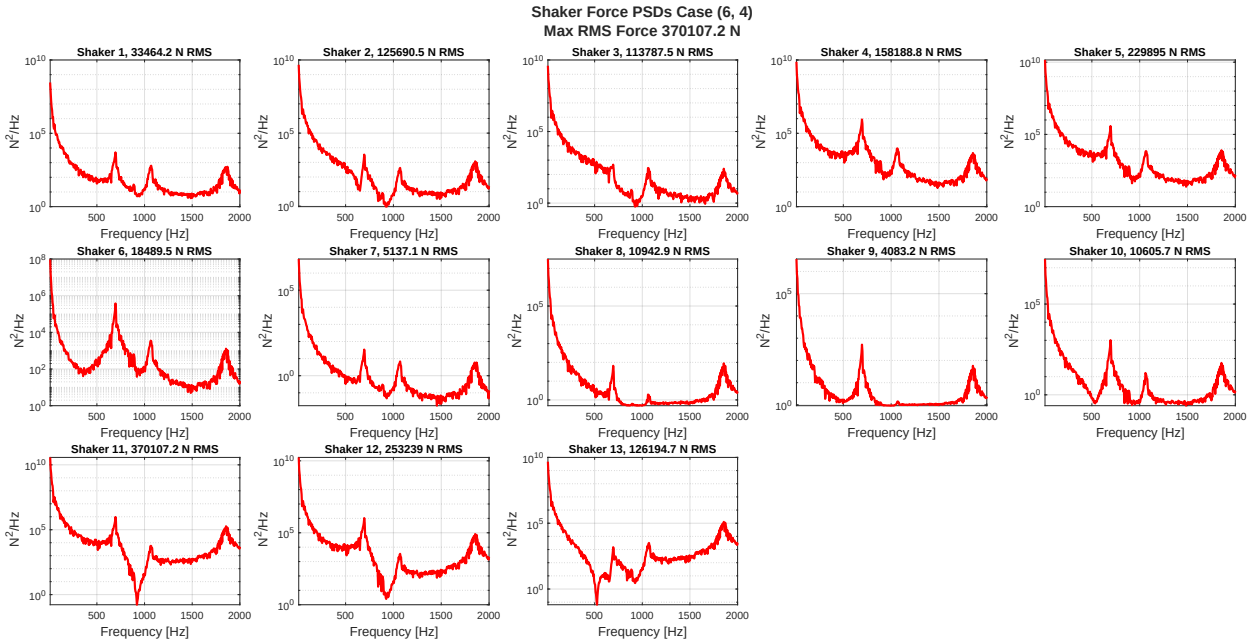


Figure 260: Shaker Forces, Noise, No CN, Case (6,4)

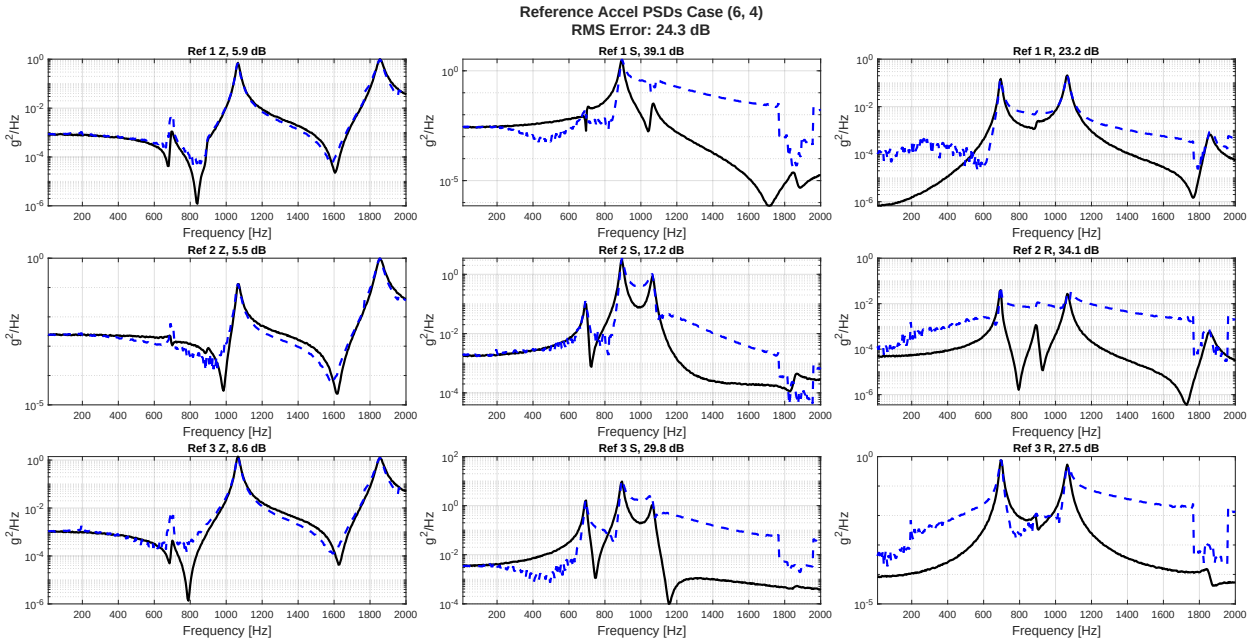


Figure 261: Reference Accels, Noise, with CN, Case (6,4)

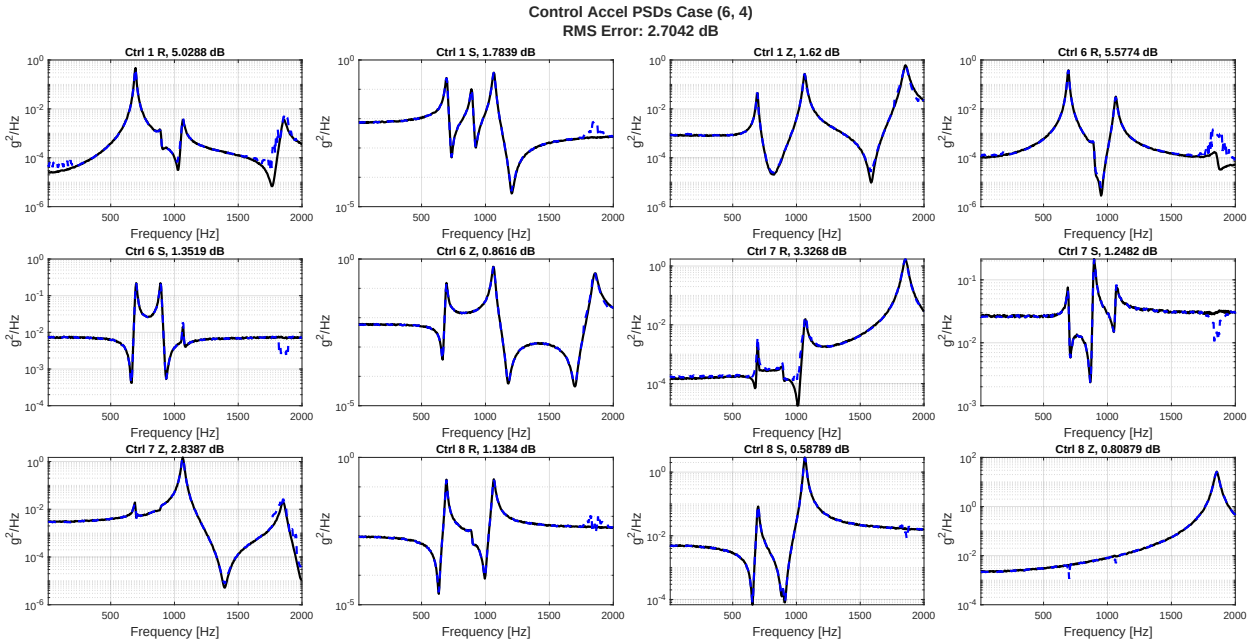


Figure 262: Control Accels, Noise, with CN, Case (6,4)

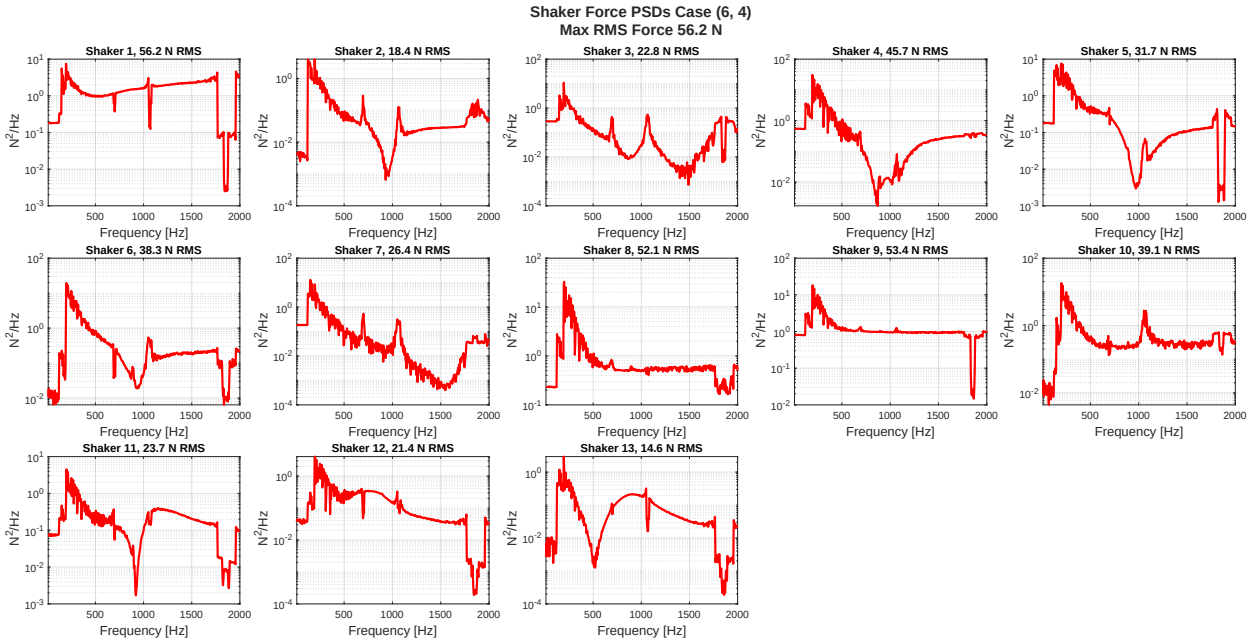


Figure 263: Shaker Forces, Noise, with CN, Case (6,4)

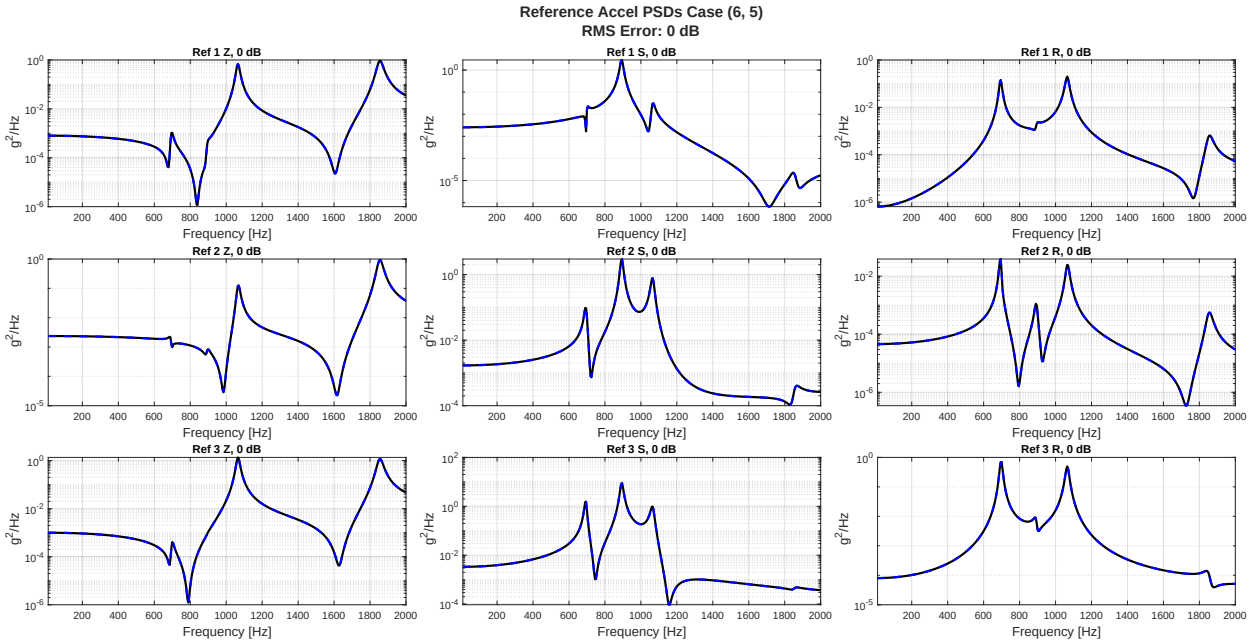


Figure 264: Reference Accels, No Noise, Case (6,5)

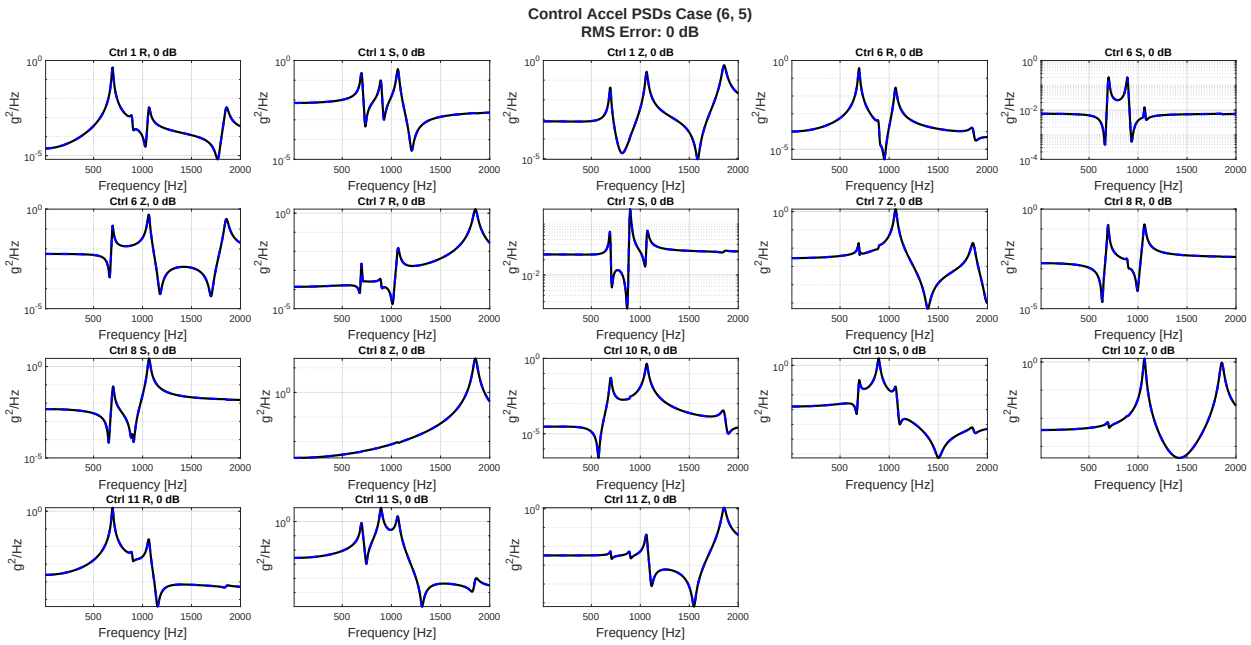


Figure 265: Control Accels, No Noise, Case (6,5)

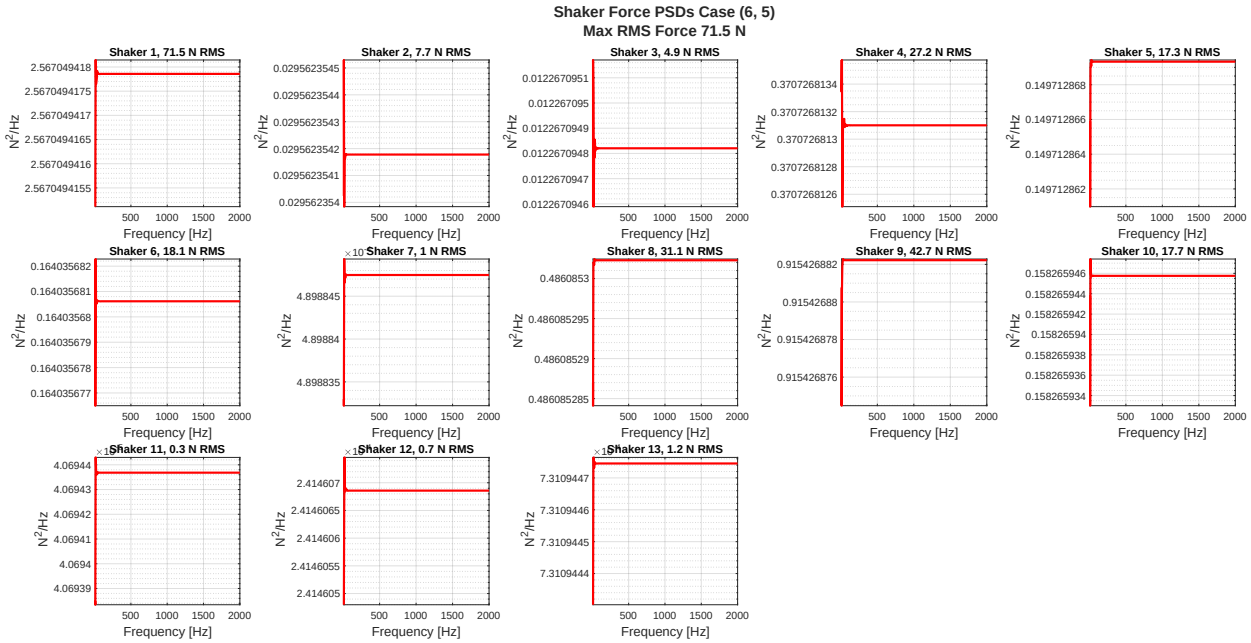


Figure 266: Shaker Forces, No Noise, Case (6,5)

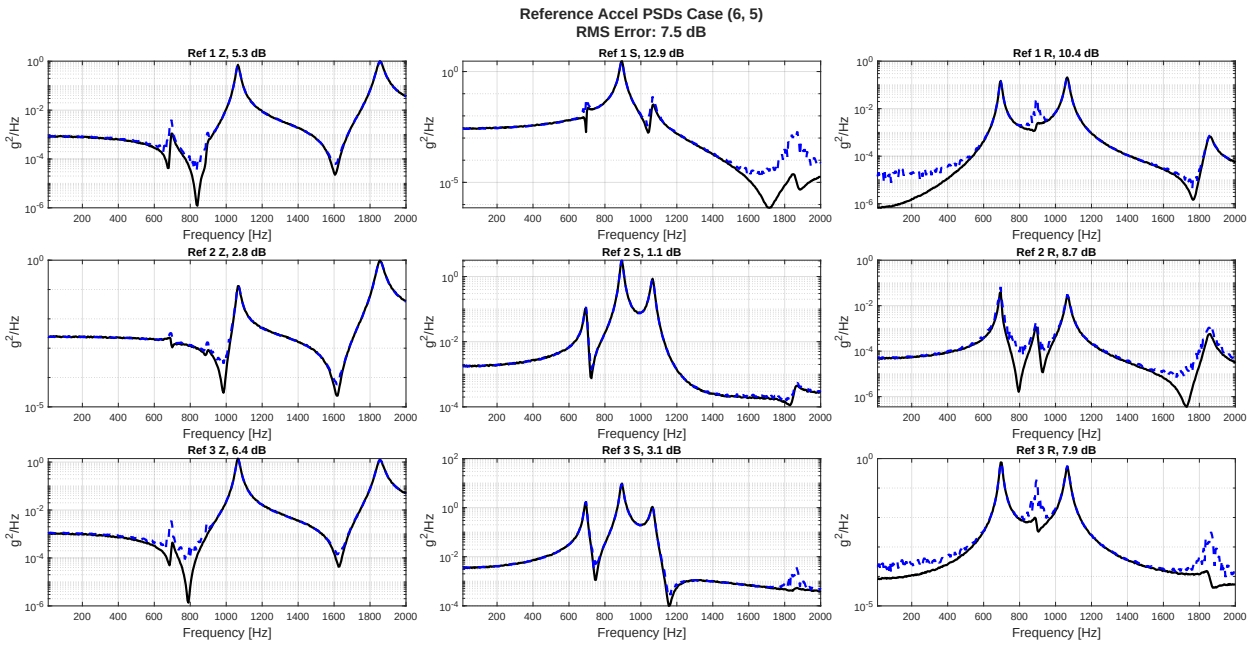


Figure 267: Reference Accels, Noise, No CN, Case (6,5)

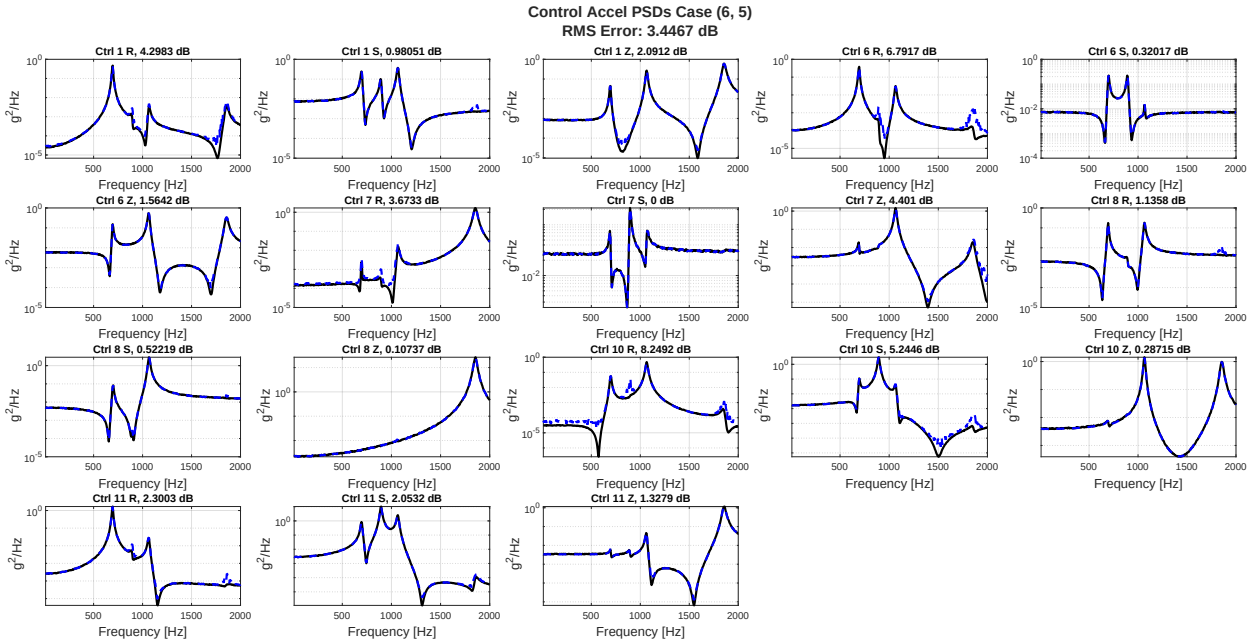


Figure 268: Control Accels, Noise, No CN, Case (6,5)

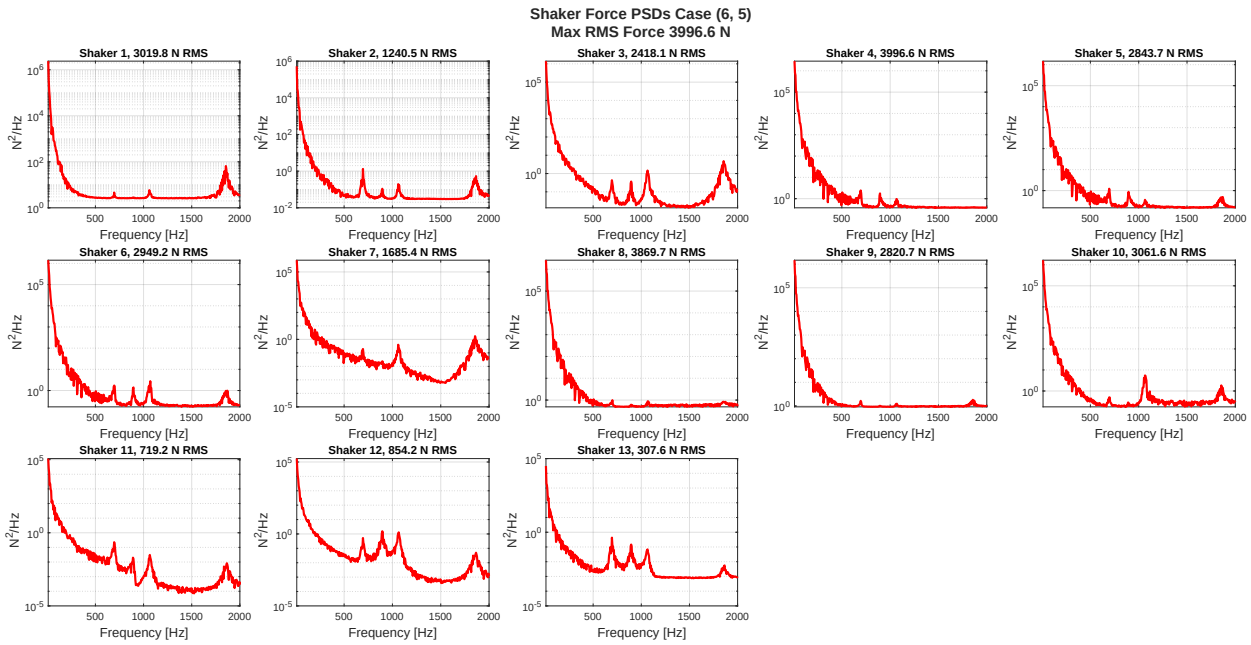


Figure 269: Shaker Forces, Noise, No CN, Case (6,5)

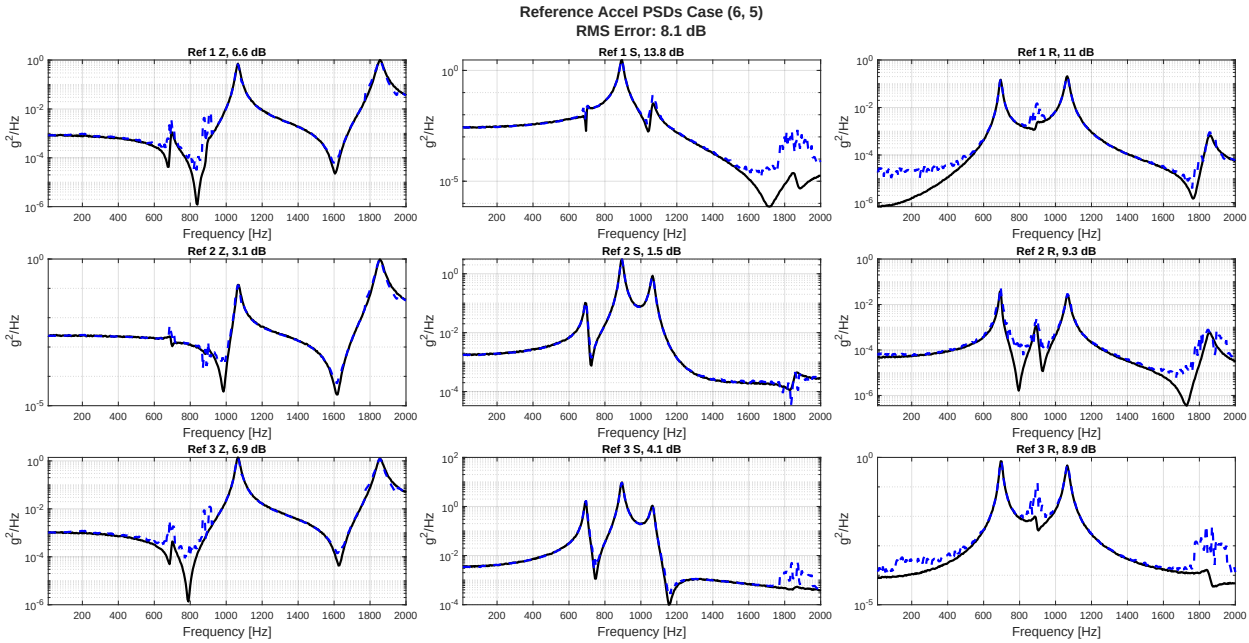


Figure 270: Reference Accels, Noise, with CN, Case (6,5)

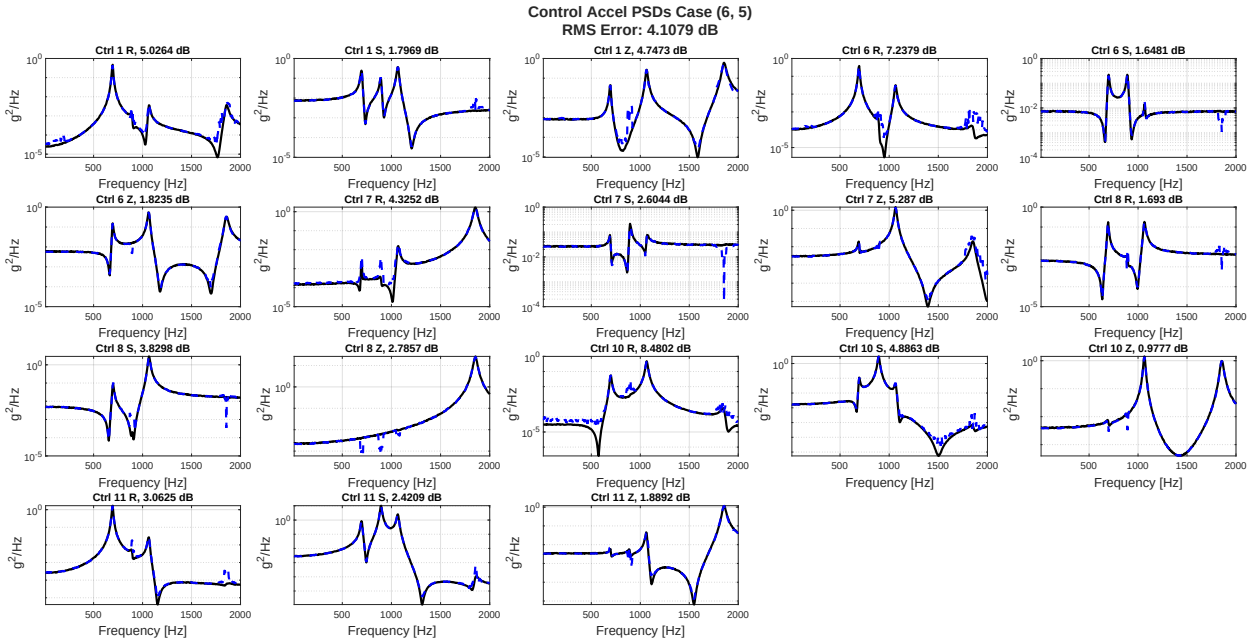


Figure 271: Control Accels, Noise, with CN, Case (6,5)

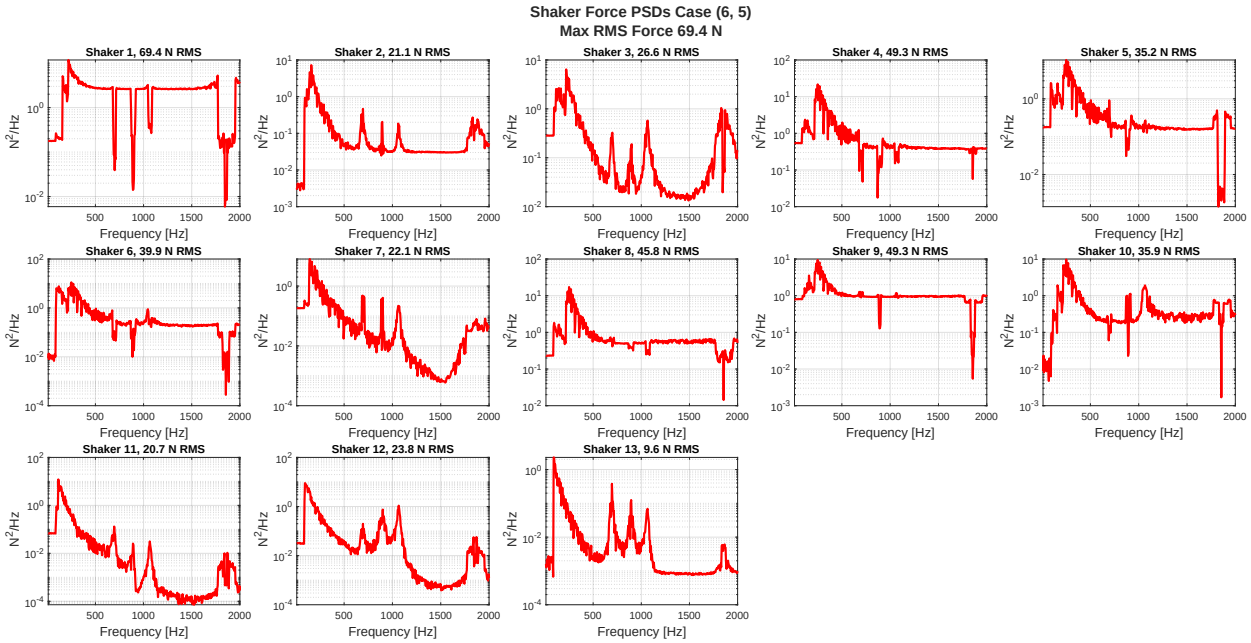


Figure 272: Shaker Forces, Noise, with CN, Case (6,5)