



APPENDIX C - MODAL ANALYSIS OF HINGED-HINGED BEAM

Number of averaged Procedures: 100

The identified natural frequencies, modal damping factors and normal modes are listed in Tables C.1 and C.2.

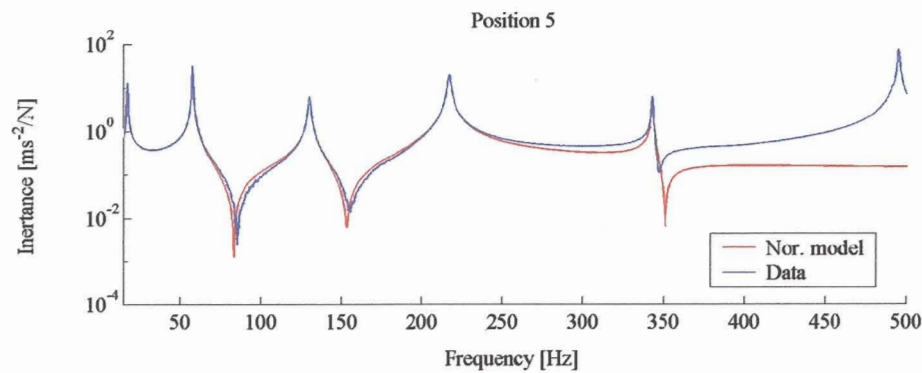
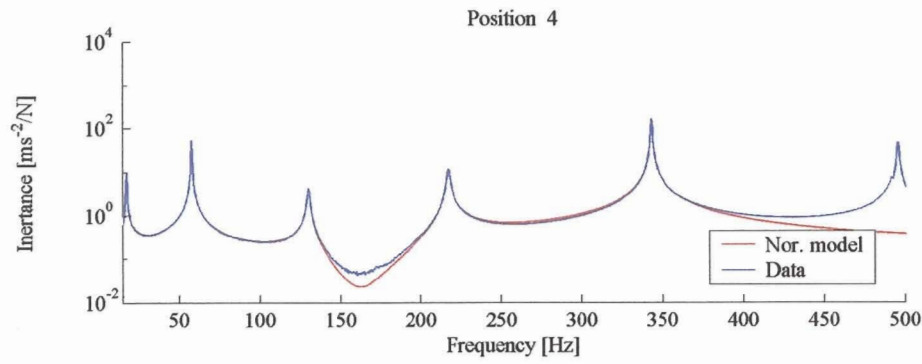
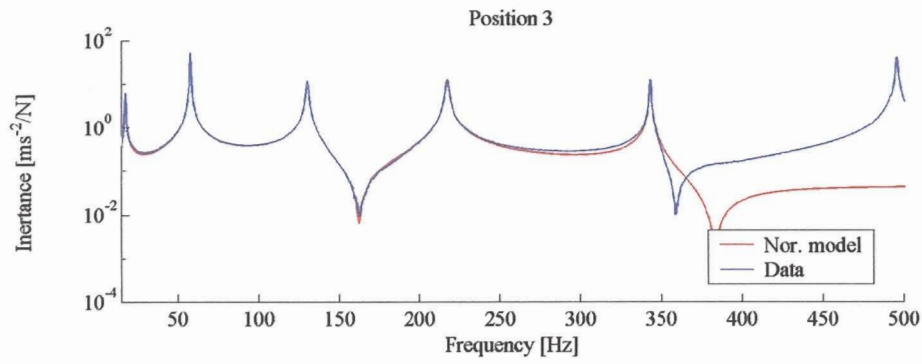
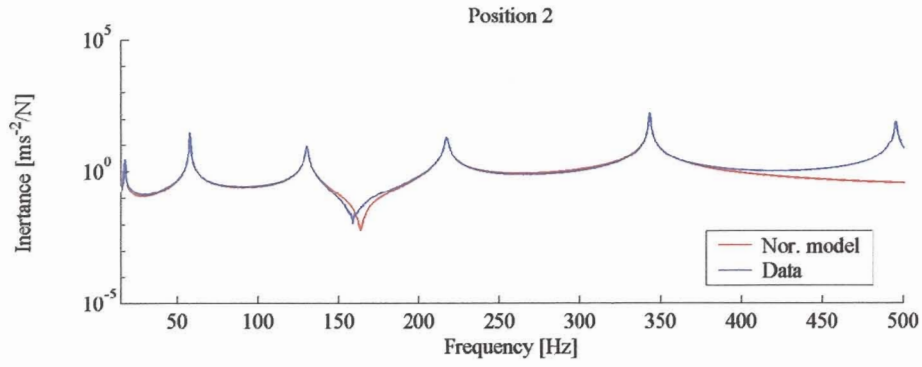
Table C.1 - Natural Frequencies and modal damping factors for the hinged-hinged beam

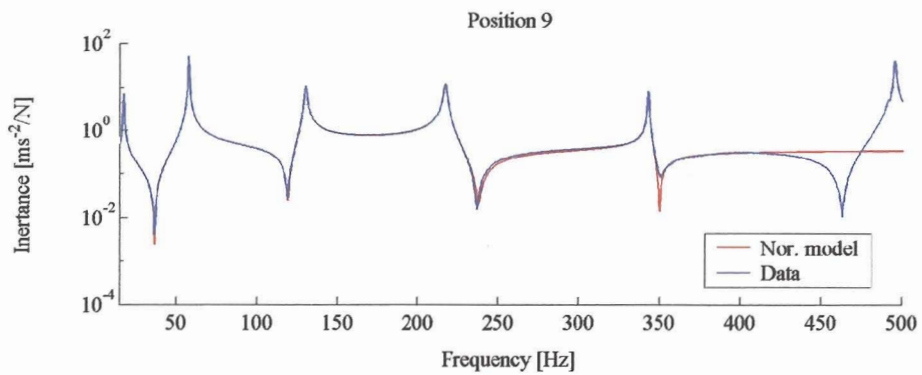
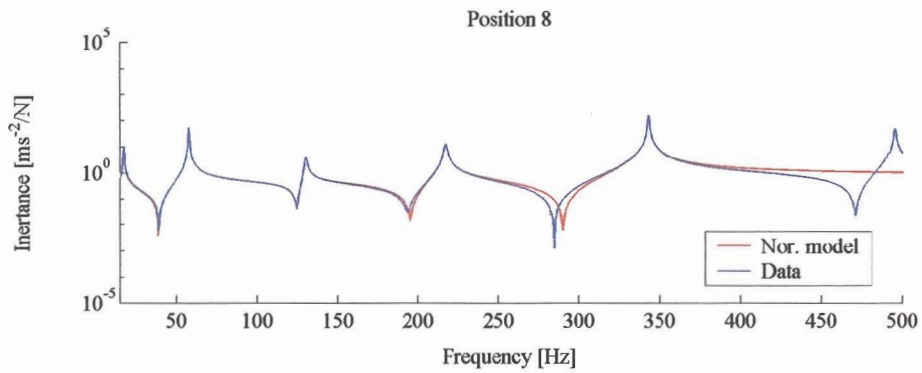
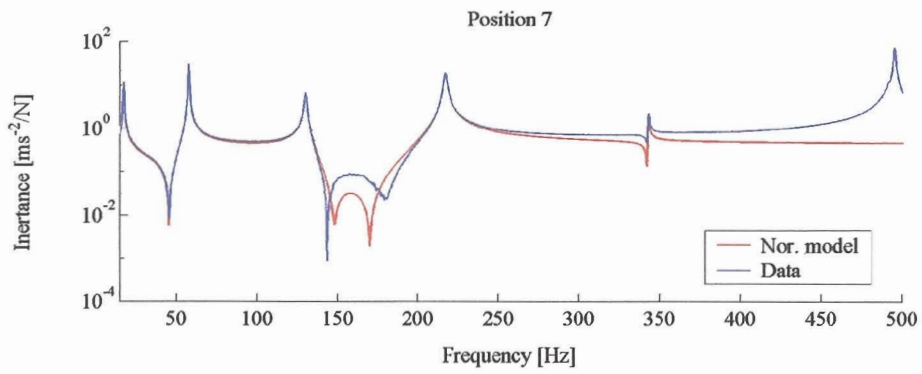
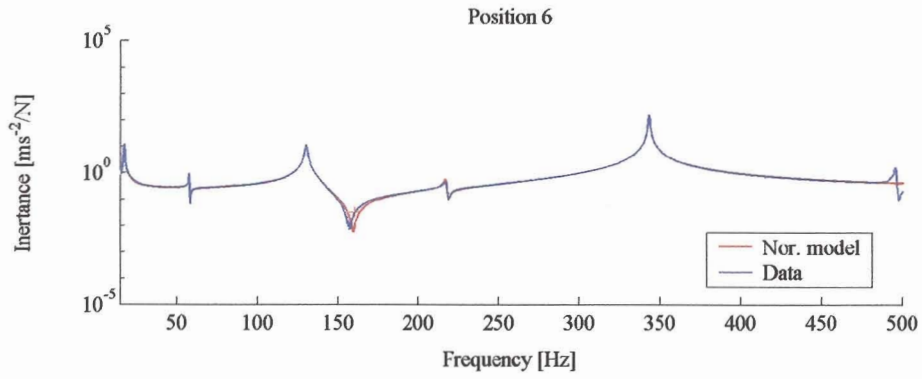
Natural frequencies	Modal damping factors $\times [10^{-4}]$
17.130	81.206
57.222	22.496
129.81	41.237
216.48	36.900
342.64	7.6922

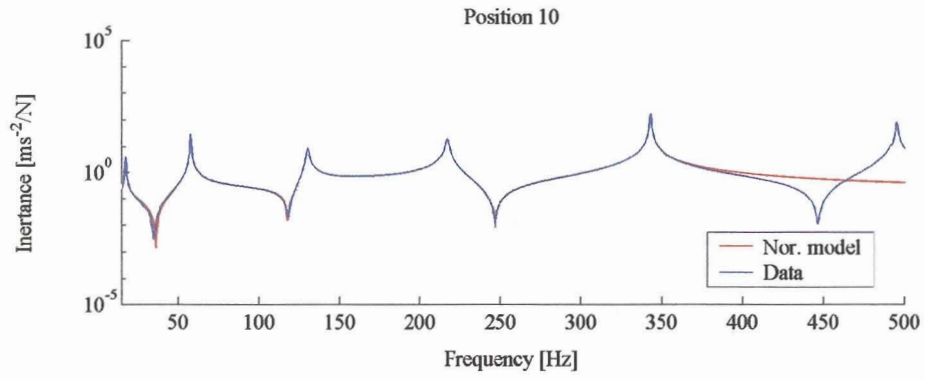
Table C.2 – Identified normal modes for the hinged-hinged beam

Position	Mode 1 $\times [10^{-1}]$	Mode 2 $\times [10^{-1}]$	Mode 3 $\times [10^{-1}]$	Mode 4 $\times [10^{-1}]$	Mode 5 $\times [10^{-1}]$
2	1.1956	-2.7045	3.9763	4.7034	-5.4634
3	2.6710	-4.8463	5.1423	3.0304	-0.4111
4	4.1645	-5.0361	1.9649	-2.8866	5.2821
5	5.3259	-3.0588	-2.7845	-4.7733	0.1926
6	5.1190	-0.0773	-5.1073	-0.1078	-5.1595
7	4.7935	2.8529	-2.9713	4.7192	0.0530
8	4.0780	4.8785	1.8480	2.9380	5.1217
9	3.0438	4.8799	4.9294	-2.9332	-0.2507
10	1.6110	2.8048	4.0255	-4.6629	-5.2576

The following figures show the measured frequency response function data corresponding to reference position 8 and the reconstructed normal mode model without the contributions of the residual terms.









APPENDIX D - MODAL ANALYSIS OF HINGED-HINGED BEAM

Number of averaged Procedures: 200

The identified natural frequencies, modal damping factors and normal modes are listed in Tables D.1 and D.2.

Table D.1 - Natural frequencies and modal damping factors for the hinged-hinged beam with two harmonic force inputs

Natural frequencies [Hz]	Modal damping factors $\times [10^{-4}]$
17.228	148.44
57.303	42.140
129.79	44.154
216.31	56.103
342.66	8.410
494.19	11.672
648.33	10.021

Table D.2 – Identified normal modes for the hinged-hinged beam with two harmonic force inputs

Position	Mode 1 $\times [10^{-1}]$	Mode 2 $\times [10^{-1}]$	Mode 3 $\times [10^{-1}]$	Mode 4 $\times [10^{-1}]$	Mode 5 $\times [10^{-1}]$
2	-1.0774	-2.7529	4.0682	4.7618	-4.9274
3	-2.4214	-4.7255	5.1187	3.1239	-0.4099
4	-3.6565	-4.9741	2.0027	-2.8965	4.6762
5	-4.3895	-3.2095	-2.7771	-4.8207	0.1359
6	-4.6137	-0.1007	-4.8680	-0.0438	-4.7837
7	-4.2844	2.9175	-2.8460	4.7831	0.0314
8	-3.6914	4.7672	1.9263	3.0309	4.7526
9	-2.6569	4.7833	5.0503	-2.9069	-0.2191
10	-1.3283	2.9776	3.9585	-4.6472	-4.8786

Position	Mode 6 $\times [10^{-1}]$	Mode 7 $\times [10^{-1}]$
2	-4.8896	3.7760
3	2.4546	4.2764
4	3.0719	1.4962
5	-4.5333	2.9315
6	-0.0551	4.4332
7	4.6077	2.7099
8	-2.9897	1.6478
9	-2.4897	4.2718
10	4.8393	3.5324

The following figures show the measured frequency response function data and the reconstructed normal mode model without the contributions of the residual terms.

