

Preliminary modal testing of the beam splitter structure

Tim Hayler
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Introduction

This work covers a preliminary modal test of the beam splitter structure to get an idea of its behaviour before committing to a more detailed study, any lessons learned will be applied to subsequent work. Modal testing was done with the structure on four steel blocks.

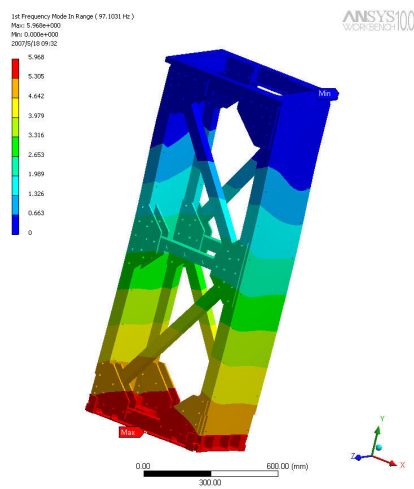


Fig 1. First modal frequency 97Hz

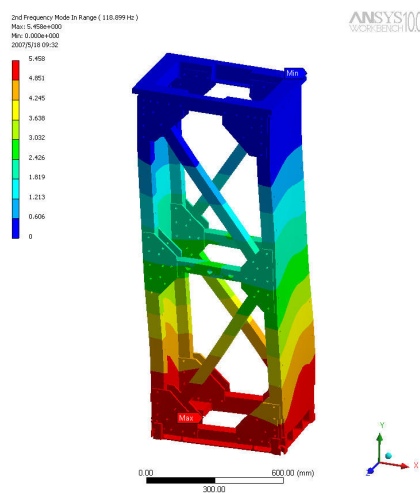


Fig 2. Second modal frequency 119Hz

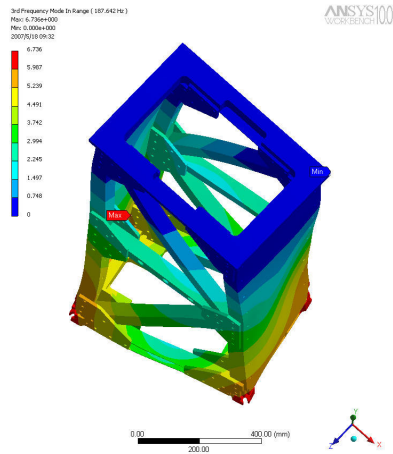


Fig 3. Third modal frequency 187Hz

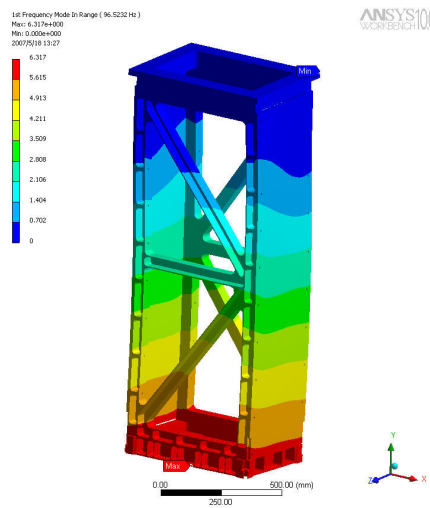


Fig 4. First modal frequency 97Hz

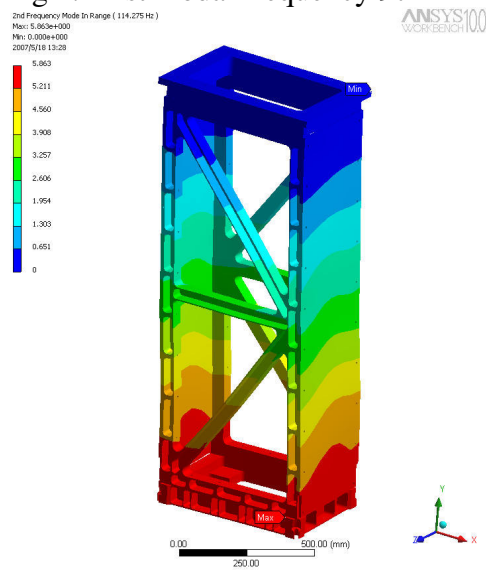


Fig 5. Second modal frequency 114Hz

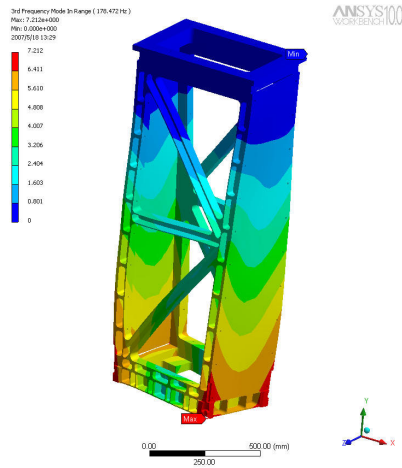


Fig 6. Third modal frequency 178Hz

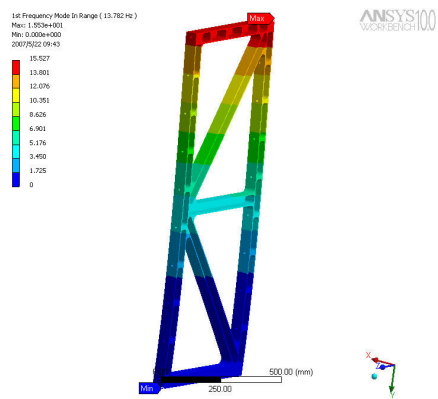


Fig 7. First modal frequency 13.7Hz

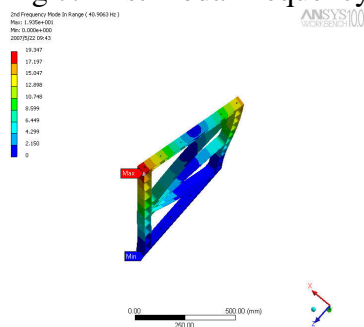


Fig 8. Second modal frequency 41Hz

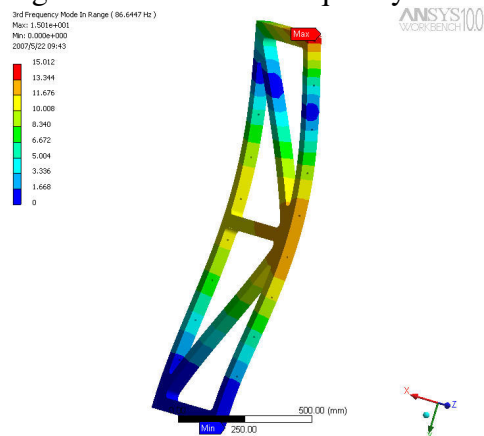


Fig 9. Third modal frequency 87Hz

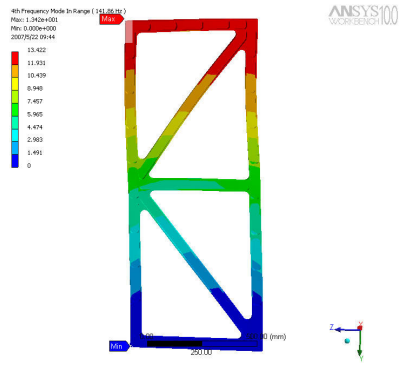


Fig 10. Fourth modal frequency 142Hz

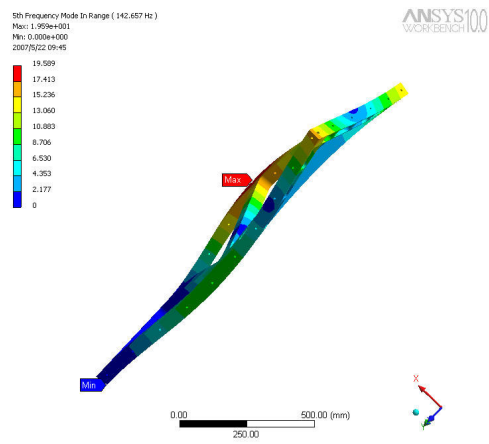
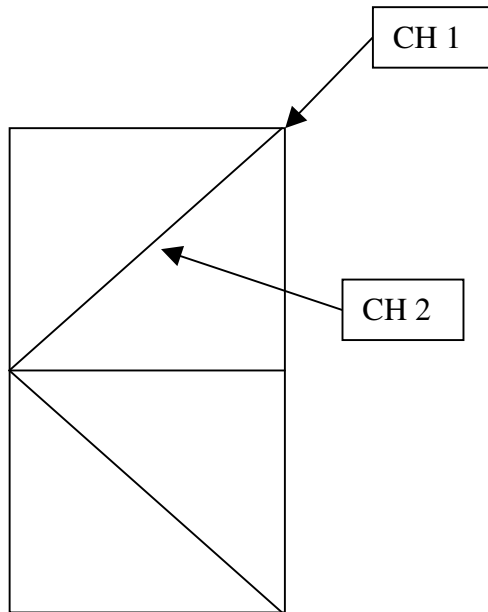


Fig 11. Fifth modal frequency 143Hz

Single face plate bolted to bottom ring



Excited in longitudinal direction		
FEA	Channel 1	Channel 2
13.7	14	14
41	35	N/A
87	82	82
142	127?	127?
143	127?	127?

Two face plates

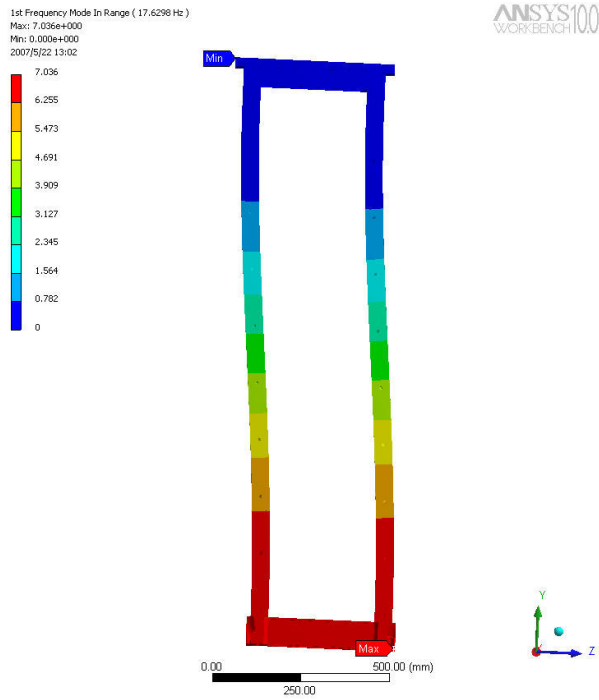


Fig 12. First modal frequency 18Hz

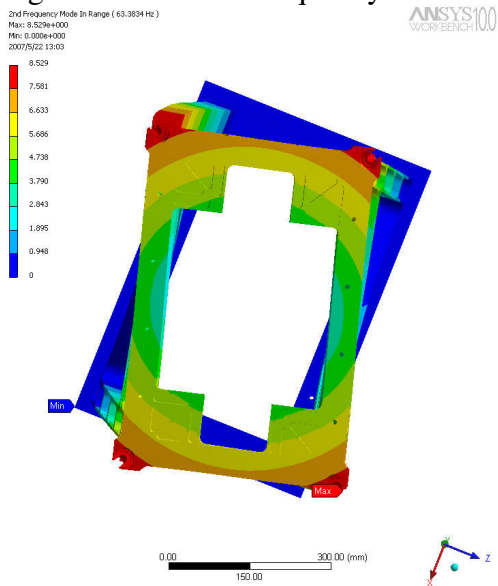


Fig 13. Second modal frequency 63Hz

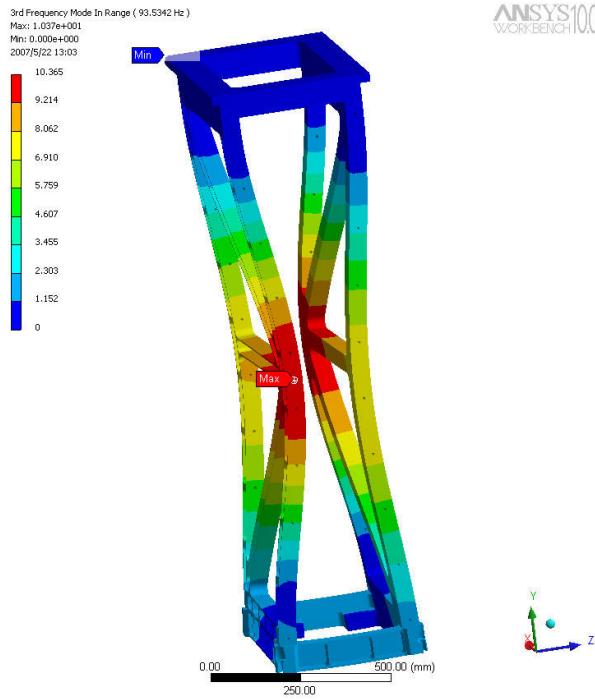


Fig 14. Third modal frequency 94Hz

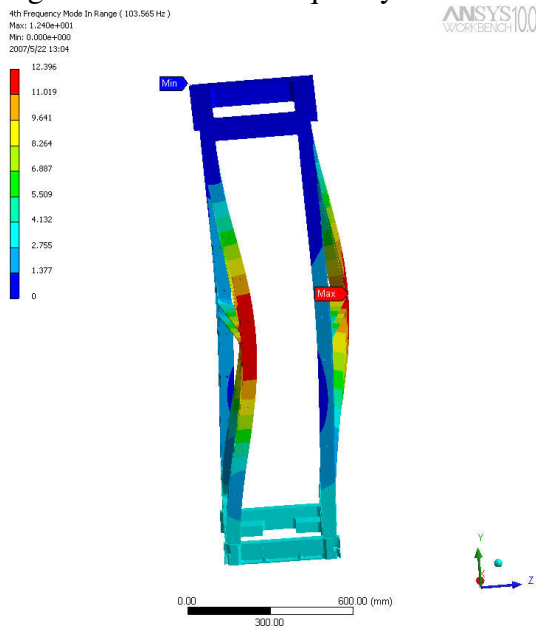


Fig 15. Fourth modal frequency 104Hz

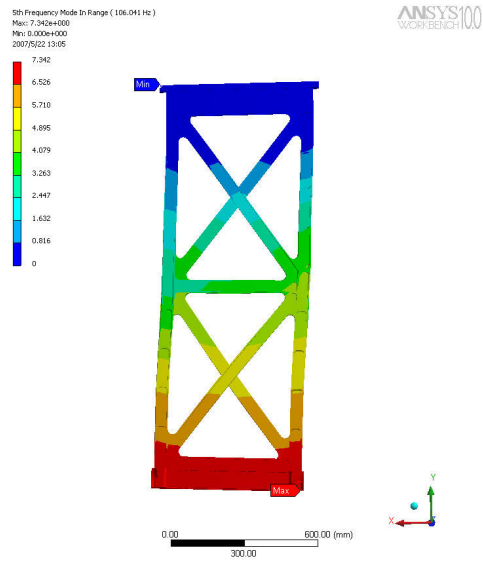


Fig 16. Fifth modal frequency 106Hz

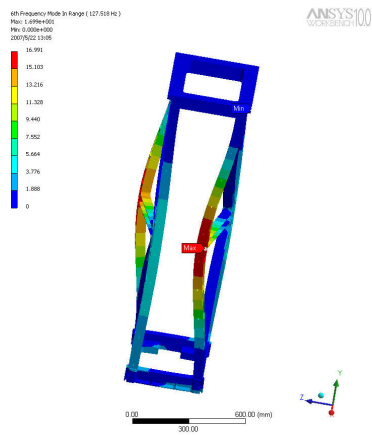
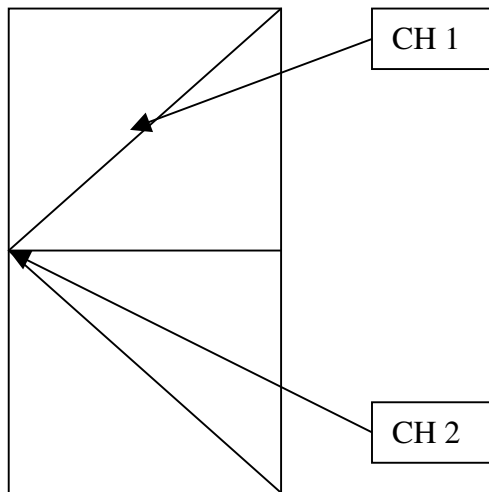
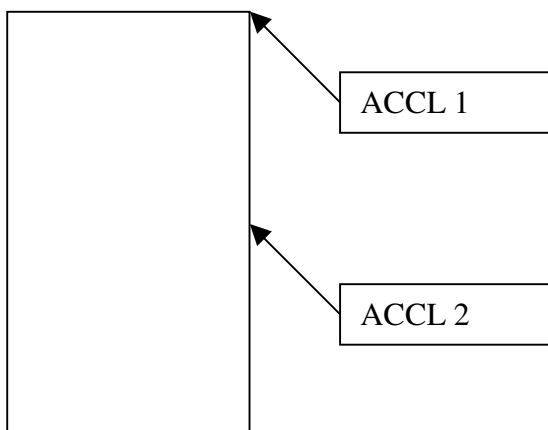


Fig 17. Sixth modal frequency 128Hz



Excited in longitudinal direction			
FEA	Channel 1	Channel 2	Discrepancy %
18	16	16	11
63	N/A	55	13
94	78	78	17
104	87	87	17
128	105	105	18



Excited in traverse direction			
FEA	ACCL 1	ACCL 2	Discrepancy %
114 With face plates	97Hz 109mVpk	97Hz 73mVpk	15
106 No face plates	104Hz 441mVpk	104Hz 203mVpk	2