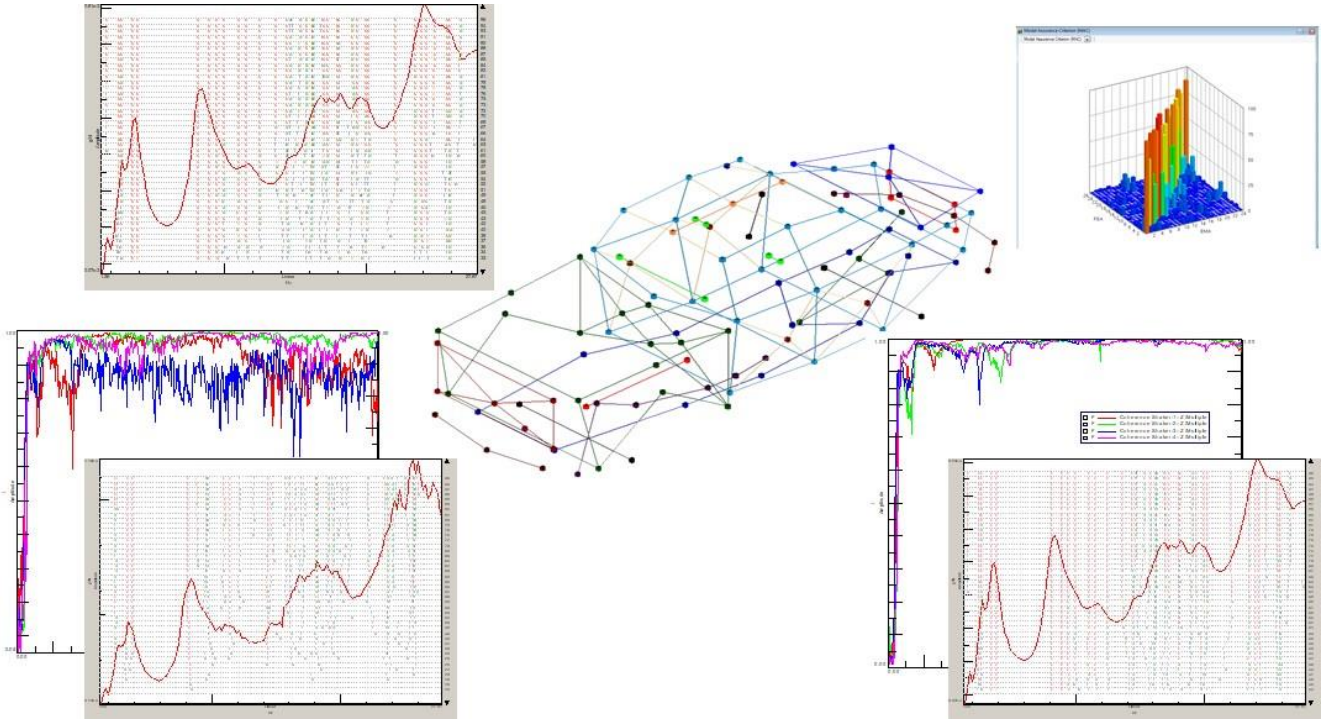
Appropriate Excitation for Mode Extraction



Recent testing on fully dressed automotive vehicles for both modal tests and 4-poster operating tests have produced some results that in general have some inconsistencies. Vertical excitation for fully dressed automotive vehicles may not provide the best possible excitation to extract good modal representations for all the modes of the system; 4-poster tests are a similar configuration and will suffer from the same deficiencies. In general, all the ancillary subcomponents (seats, tank, power train, radiator, etc.) may not be properly excited and therefore the complicated local modes of these subcomponents may not be adequately characterized. Modal excitations (which contains more than just vertical excitations) must be applied in order to extract useful valid modes of the system.

As an academic exercise, a framed structure with floor board and seats was used to further study some of the significant features observed in a full vehicle modal and operating test to see if some of the typical issues could be replicated in a simpler structure to better study the modes observed and their dependence on the adequate excitation of all the modes of the structural system. The results of these tests and some of the observations are presented to better understand and illustrate the importance of performing a proper modal test with modal excitations that adequately excite all the modes of the system, thereby enabling a better extraction of modal data from a modal test

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