ViPAC Automotive

Vibro-Acoustic and Finite Element Modelling

Vibration and noise in structures such as motor vehicles, boats, buildings or trains can be difficult to predict due to the large numbers of components in the structure.

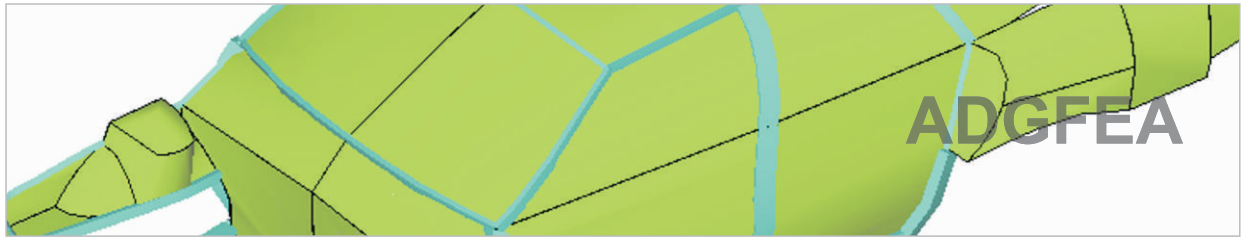
VIPAC's Analysts are expert in the use of computer models utilised to predict the inherent Noise and Vibration characteristics of such environments.

By Using Statistical Energy Analysis (SEA), large and/or complex structures can be reduced to manageable design problems allowing the study of optimum vibration and noise reduction solutions.

VIPAC Analysts are also experienced in Finite Element (FEM) and Boundary Element (BEM) methods. These tools are employed to target detailed prediction of low to mid frequency noise and vibration phenomena. VIPAC uses ANSYS and RAYON solvers, along with custom processing routines written in MATLAB.

Services

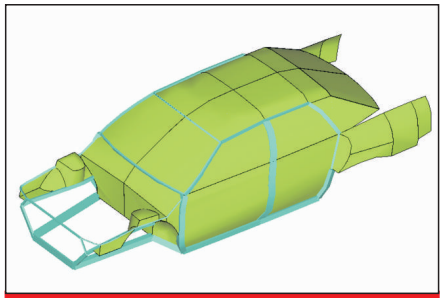
- Statistical Energy Analysis (SEA)
- Finite Element Modelling (FEM)
- Boundary Element Modelling (BEM)
- Modal Analysis



Vibro-Acoustic and Finite Element Modelling

Statistical Energy Analysis

SEA was developed in the 1960's in order to predict vibration levels in space vehicles. At the time the computing power was not available to solve a Finite Element model of such large structures. SEA is an energy based method and relies on the inherent variability present in all structures to make predictions of the average noise or vibration level of a structure. By balancing the vibration or noise energy levels within a structure predictions of the vibration response can be efficiently predicted. The method has been validated for all sorts of systems from spacecraft to skyscrapers.
SEA is a high frequency method, that is it assumes that the vibration or noise is equally distributed within each segment of the structure, this is in contrast to low frequency Fes methods were the vibration or noise level varies significantly within a single part of the structure.
By using the VA-one software ViPAC Engineers and Scientists can combine SAE, FEM and BEM methods to predict noise and vibration over the entire frequency range, this can encompass low frequency response to machinery or ground disturbance such as trains up to high frequency noise such as wind noise inside automobiles or vibration from fluid flow within pipes.



SEA Model

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