S1: Supplementary: FE validation of the host structure

To validate the FE model of the host beam, an experiment is carried out on an aluminum beam, where the natural experimental frequencies are measured. The beam is suspended freely to achieve free-free boundary conditions. MFC with an active area 25×3 mm^2 (or 0.98×0.12 inch^2 is used to provide excitation at one end of the beam, and FRFs are measured at 100 equidistant points over the length of the beam using SLDV.

The number of discretized elements in the FE model is varied to get a converged model for the host structure. Eigenvalues are calculated for the FE model with 50 elements, 100 elements, 150 elements, 200 elements, and 250 elements. It can be seen from Figure 1 that the relative difference in eigenvalues between FE models with 200 and 250 elements is negligible. Moreover, Figure 2 shows the FRF obtained from the FE model with 250 elements overlay with the experimentally measured FRF at the same location. Hence, 250 discretized FE elements are used to model the host structure.

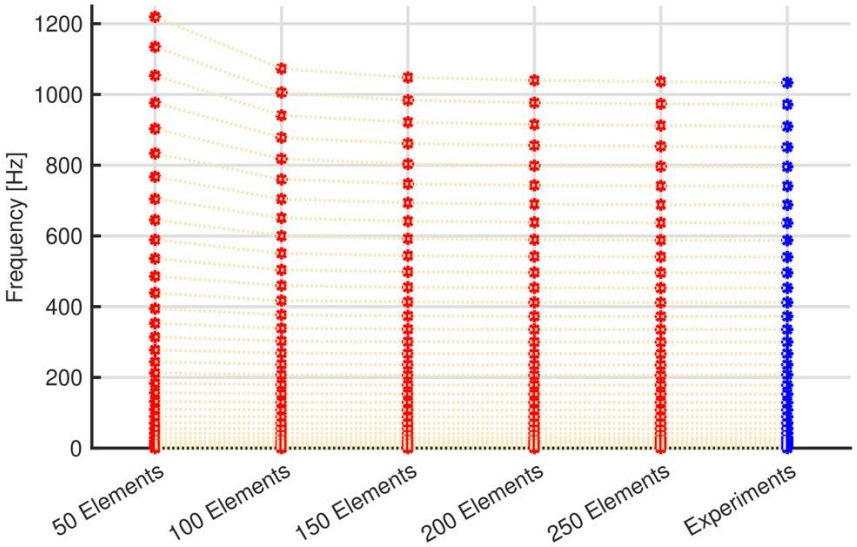


Figure S1: Comparing with the experimentally measured natural frequencies, the frequencies are converged as we increase the number of elements in the FE model from 50 elements to 250 elements

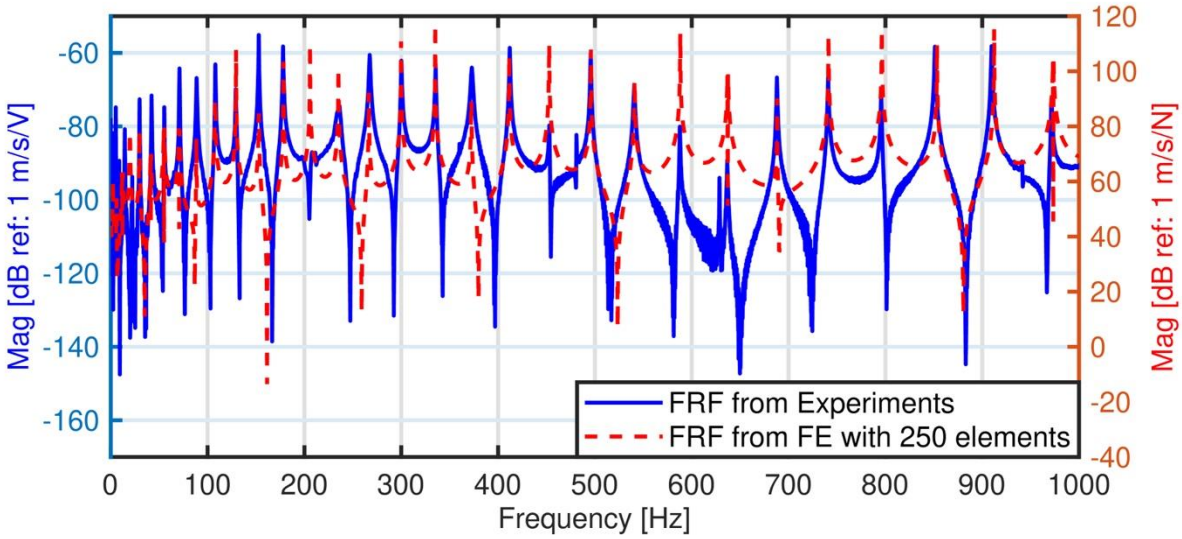


Figure S2 : Frequency response of the host structure with 250 elements and experiments overlay on each other validating the FE model