



VIBRATION BASED HEALTH MONITORING OF HONEYCOMB CORE SANDWICH PANELS USING SUPPORT VECTOR MACHINE

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Abstract- Honeycomb sandwich structures are extensively used in aerospace, aeronautic, marine and automotive industries due to their high strength-to-weight ratios, high energy absorption capability and effective acoustic insulation. Unfortunately, either presence of disbond along the skin-core interface or emergence of disbond due to repeated loading, aging or an intensive load can jeopardize the integrity and safety of the whole structure. The current work presents a new array based technique for health monitoring of these structures using support vector machine (SVM). The proposed technique is first used on simulated mode shape data of the structure and then the technique is validated using experimental mode shape data. The experimental set up has been developed in laboratory and Laser Doppler Vibrometer (LDV) is used to extract the experimental mode shapes. The results have been obtained using both support vector classification and regression analysis and it is found that that the former is better at prediction of debond location.

Index terms: Support vector machine, Structural health monitoring, Laser Doppler Vibrometer, Mode Shape Data, Honeycomb core sandwich panel.