World Academy of Science, Engineering and Technology
International Journal of Mechanical and Industrial Engineering
Vol:12, No:04, 2018

Identification of Force Vector on an Elastic Solid Using an Embeded PVDF Senor Array

Authors : Andrew Youssef, David Matthews, Jie Pan

Abstract : Identifying the magnitude and direction of a force on an elastic solid is highly desirable, as this allows for investigation and continual monitoring of the dynamic loading. This was traditionally conducted by connecting the solid to the supporting structure by multi-axial force transducer, providing that the transducer will not change the mounting conditions. Polyvinylidene fluoride (PVDF) film is a versatile force transducer that can be easily embedded in structures. Here a PVDF sensor array is embedded inside a simple structure in an effort to determine the force vector applied to the structure is an inverse problem. In this paper, forces of different magnitudes and directions where applied to the structure with an impact hammer, and the output of the PVDF was captured and processed to gain an estimate of the forces applied by the hammer. The outcome extends the scope of application of PVDF sensors for measuring the external or contact force vectors.

Keywords : embedded sensor, monitoring, PVDF, vibration
Conference Title : ICSV 2018 : International Conference on Sound and Vibration
Conference Location : Boston, United States
Conference Dates : April 23-24, 2018