

Experimental and theoretical investigations of the impact localization of a passive smart composite plate fabricated using piezoelectric materials

ABSTRACT

Two passive smart composite plates are fabricated using one and two PZT patches that are cheaper than the PZT wafer. The composite plate is fabricated in low temperature through the hand lay-up method to avoid PZT patch decoupling and wire spoiling. The locus of the impact point is identified using the output voltage to identify the impact location using one sensor. The output voltages of the sensors are analyzed to identify the impact location using two sensors. The locations of the impacts are determined based on the crossing points of two circles and the origin of an intended Cartesian coordinate system that is concentric with one of the sensors. This study proposes the impact location identification of the passive smart composite using the low-cost PZT patch PIC155 instead of common embedded materials (wafer and element piezoelectric).

Keyword: Piezoelectric; Cartesian coordinate system; Composite plates