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Examining the Efficacy of Finite Element Method for Detecting Damage in Aluminium Structures
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Abstract
Current engineering structures are effectively utilizing monitoring techniques based on electromechanical impedance (EMI) by employing piezoelectric sensors the EMI method is employed to monitor structural health of these systems. This study focuses on performing numerical analyses for structural health monitoring in healthy and damaged aluminium structures. For numerical analysis a finite element-based program in ANSYS commercial tool was utilized to model the beams made of undamaged and damaged aluminium. Additionally parametric studies were done to determine the impedance signal in aluminium structures with Lead-Zirconate-Titanate (PZT). The results obtained indicate that the finite element (FE) modeling with EMI technique is valuable for health monitoring of structures with impedance for healthy and damaged aluminium structures.

Author Keywords
aluminium structure; Damage detection; FEM; impedance analyser; piezoelectric materials

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