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Damage Detection of Layered Structures Using Surface Acoustic Waves

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This paper explores the possibility of damage detection of surface defect using Surface Acoustic Waves (SAW). In order to reduce the experimental cost and establish theoretical basis for the future experiment, a mathematical analysis of the problem is performed. Afterwards, a FEM model is setup to investigate the propagation of SAW.

In this study, a layered structure made of Aluminum Nitride/diamond/ γ -TiAl is investigated. The γ -TiAl is a promising material for high temperature application in the aerospace and automotive industries due to its lightweight, high specific strength and excellent corrosion resistance. By coating diamond on the γ -TiAl surface will not only enhance the abrasion resistance and the fretting wear resistance of the γ -TiAl, but will also provide the structure with high SAW speed. An AlN thin film is overlaid on the structure surface because of its excellent piezoelectric property and high temperature oxidation resistance. In order to generate and detect the SAW, Interdigital Transducers (IDT) is fabricated on the AlN surface.

Ключевые слова:

Содержание.

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