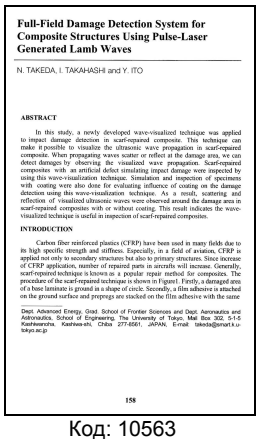

Full-Field Damage Detection System for Composite Structures Using Pulse-Laser Generated Lamb Waves

N. TAKEDA, I. TAKAHASHI and Y. ITO

ABSTRACT

In this study, a newly developed wave-visualized technique was applied to impact damage detection in scarf-repaired composite. This technique can make it possible to visualize the ultrasonic wave propagation in scarf-repaired composite. When propagating waves scatter or reflect at the damage area, we can detect damages by observing the visualized wave propagation. Scarf-repaired composites with an artificial defect simulating impact damage were inspected by using this wave-visualization technique. Simulation and inspection of specimens with coating were also done for evaluating influence of coating on the damage detection using this wave-visualization technique. As a result, scattering and reflection of visualized ultrasonic waves were observed around the damage area in scarf-repaired composites with or without coating. This result indicates the wave-visualized technique is useful in inspection of scarf-repaired composites.

INTRODUCTION

Carbon fiber reinforced plastics (CFRP) have been used in many fields due to its high specific strength and stiffness. Especially, in a field of aviation, CFRP is applied not only to secondary structures but also to primary structures. Since increase of CFRP application, number of repaired parts in aircrafts will increase. Generally, scarf-repaired technique is known as a popular repair method for composites. The procedure of the scarf-repaired technique is shown in Figure1. Firstly, a damaged area of a base laminate is ground in a shape of circle. Secondly, a film adhesive is attached on the ground surface and prepregs are stacked on the film adhesive with the same

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Ключевые слова:

Содержание.