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Optimization of composite patch repair for center-cracked rectangular plate using design of experiments method (Conference Paper)

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Abstract

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The repair of aircraft structures using composite material patches are well known in aerospace industries. In the present work composite patch bonded with a superglue over a cracked rectangular plate under uniform uniaxial tensile stress is considered. A three-dimensional finite element method was used to define the stress intensity factor for a repaired plate at mode-I crack propagation. Later, the design of experiments method was used to investigate the parametric effect on repair structure in order to achieve the optimum solution. The size and mechanical properties of the adhesive bond and composite patch that affect the repair quality are considered as the parameters for reduction in stress intensity factor. The outcome of this work will serve as a guideline for designer to improve the repair quality and durability. © 2019 Elsevier Ltd. All rights reserved.

SciVal Topic Prominence

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Composite patch | Crack | Design of experiments | Finite element method | Optimization | Passive repair

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