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USAF Perspective on Foundational Challenges for Enhanced Damage Sensing

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Structural integrity programs of the United States Air Force (USAF) include periodic inspection to detect damage before it grows to a critical size that can impact the safety of USAF systems. Current inspection methods have been used successfully to ensure the required risk metrics for these systems are being met as mandated by the relevant USAF Standards. However, there is a continual desire to improve the capability of inspection methods while increasing the efficiency and reliability of these methods. As new approaches are being explored for the enhancement of damage sensing, a number of foundational issues that represent hurdles for the application of these enhancements have been identified. This paper provides background on how damage sensing is used by the USAF and expands on identified foundational challenges that represent technical barriers to the implementation of new damage sensing methods. As the desired capability of the damage sensing methods expand from detection of damage to the characterization of damage, the degree of complexity grows and additional challenges emerge. Representative case studies are used to illustrate challenges for detection, localization and characterization of damage.

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Ключевые слова:

Содержание

Abstract

Introduction

Damage sensing capabilities/requirements

Aerospace structural damage sensing: complexity

Aerospace structural damage sensing: challenges

Aerospace structural damage sensing: summary