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Structural Health Monitoring (SHM) technology is a revolutionary method of determining the integrity of aircraft structures, and is increasingly being evaluated by the aerospace industry as a possible method to improve the safety and reliability of aircrafts and thereby reduce their operational cost. Researchers in China have been studying SHM technologies for aerospace applications since the beginning of 1990s. This paper presents some typical research and development activities in SHM technologies and their applications in aerospace industry of China during the last two decades, especially the SHM technologies based on piezoelectric sensors. In addition, the paper briefly introduces general perspectives of commercial aircraft company on SHM systems so that they can be applied on commercial aircrafts in real world and play significant roles in commercial aviation maintenance programs. Major challenges for implementing a SHM system in the real world are also discussed, including airworthiness compliance, miniaturized lightweight hardware, self-diagnostics and an adaptive algorithm to compensate for damaged sensors, reliable damage detection under different environmental conditions.

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Ключевые слова:

Содержание

- Abstract
- Introduction
- Wave theory based SHM for complex structures
- Development of SHM systems
- Demonstrations of SHM systems
- Development of FBG sensors based SHM
- Discussion and conclusion