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Author: Dr. Yong Gao
Beijing Electro-Mechanical Engineering Institute, China Aerospace Science & Industry Corporation (CASIC), China

Dr. Denghong Xiao
Beijing Electro-Mechanical Engineering Institute, China Aerospace Science & Industry Corporation (CASIC), China

STUDY ON MECHANICAL BEHAVIOR OF C/SIC STRUCTURE UNDER HIGH TEMPERATURE BASED ON ACOUSTIC EMISSION ANALYSIS

Abstract

The present study investigates the mechanical behavior under high temperature and assesses damage by the acoustic emission method of a C/SiC composite material. Acoustic emission signals in C/SiC structure can be used for monitoring the state of item. The recorded signal includes information which can be associated with different events, such as the formation and propagation of cracks, appearance of cracks and so on. To demonstrate the influence of temperature on the parameters of the alteration of acoustic emission signals from plastic deformation, a C/SiC structure was manufactured with cut fibers in a central location and subjected to static loading to promote cracking. AE signals were located within the crack area in the first part of the test. It is shown that increasing temperatures cause an increase in the amplitude of acoustic emission signals in an area of low temperatures and a decrease in an area of high temperatures. As shown in the article, this fact is connected with the alteration of the process of deformation. The results obtained allowed a more detailed understanding of such sources of AE in C/SiC structure laminates.