

MATERIALS AND STRUCTURES SYMPOSIUM (C2)

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Author: Ms. lina mao

Beijing Institute of Structure and Environment Engineering, China, maoln1023@hotmail.com

Mr. Bing Zheng

Beijing Institute of Structure and Environment Engineering, China, zhengb4333@163.com

Mr. Feiran Wang

Beijing Institute of Structure and Environment Engineering, China, Wferty@163.com

Mr. Wei Feng

Beijing Institute of Structure and Environment Engineering, China, 13681465448@163.com

A FEW VARIETIES OF MEASUREMENT METHODS FOR TESTING COMPOSITE STRUCTURES

Abstract

The rapid development of space technology makes greater development of materials science. Advanced composite materials which depend on its strength high modulus, high temperature performance, excellent fatigue resistance and other advantages have widely used and swift and violent development. Composite materials in aerospace field have also been recognized by the industry, the manufacture of aircraft fuselage, rudder, elevator and other components used. With the development of the aerospace industry, aircraft, launch vehicles and missiles, satellites and other materials have become increasingly demanding, new materials and new technology has evolved, thereby protecting the product's high performance, high reliability and low cost. C/C composites with superior performance advantages widely used in aerospace and aviation aircraft. Non-contact digital image photogrammetric techniques using digital image correlation (DIC) for displacement and strain measurements have been more mature. Acoustic emission technology as a nondestructive testing technique has been used in many fields. Application of digital image photogrammetric techniques, acoustic emission and strain gauges sensors to measure integrated C/C composite structure for rudder or shaft, connector mechanical properties when subjected to a torque concentrated force. Reflect the characteristics and applications of these types of testing methods. C/C composite structures connected to test platform via a flange, and the upper end connected to the loading fixture, which provides a torque force concentrated loads applied to the shaft of the roots. There are two test pieces, one has an ablated groove, and the other has not. The results of the test piece by two different structures compared to acquire the force characteristics and internal damage of the composite material structure under local stress concentration.