

MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Smart Materials and Adaptive Structures (5)

Author: Dr. Xi Lu

Shanghai Institute of Satellite Engineering, China, ucy-123@163.com

Dr. Mei Cheng

Shanghai Institute of Satellite Engineering, China, chengmei1206@163.com

Mr. Liang Xu

Shanghai Institute of Satellite Engineering, China, luxi.vsn.sjtu@gmail.com

GUIDED WAVE BASED DAMAGE EVALUATION TECHNIQUES FOR DEEP SPACE EXPLORER

Abstract

SHM (Structural Health Monitoring) stands for continued monitoring and consequent diagnosis on abnormal status of the concerned structure or mechanical system. Damage evaluation is one of main tasks of any SHM system. Among different damage evaluation techniques developed for structures, guided waves(GWs)-based methods have been recognized as a promising tool for both damage detection and identification. Deep space explorers are always complicated and costly artificial systems and deserve careful surveillance. Recently, the amount of deep space missions increases quickly all around the world, announcing higher requirements for monitoring and evaluation on the explorers' structure systems. Discussion on GW-based damage evaluation techniques for composite structural components of deep space explorer will dominate this paper. Recent outcomes from research on principles and methods for damage detection and identification, as well as sensor network optimization approaches, will be introduced. The potential application of the recommended techniques on real explorers will also be discussed, especially on the limitations and suggestions for practical demonstration.