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GUIDED WAVE AND ACTIVE SENSOR NETWORK BASED DAMAGE EVALUATION FOR DEEP SPACE PROBES

Abstract

Damage evaluation is one of main tasks of a SHM (Structural Health Monitoring) system. Among different structural damage evaluation techniques, guided waves(GWs)-based methods have been proved as a promising tool. Deep space explorers are always complicated and costly artificial systems on which careful surveillance is necessary. Recently, deep space exploration missions, launched or planed, attracted attention of the whole world, implying higher requirements for monitoring and evaluation on the explorers' structure systems. Discussion on GW and active sensor network-based damage evaluation techniques for composite structural components of deep space probe dominates this paper. Recent work on principles and methods for damage detection and identification, as well as sensor network optimization approaches, are introduced. The potential application of the techniques mentioned above on real Mars probe designing will also be discussed with emphasis on the limitations and suggestions.