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SPACE SYSTEMS SYMPOSIUM (D1)
Enabling Technologies for Space Systems (2)

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THE DESIGN AND APPLICATION OF VEHICLE STRUCTURE HEALTH MANAGEMENT SYSTEM FOR NEW GENERATION AEROSPACE VEHICLES

Abstract

Vehicle structure health management (VSHM) technique is gradually incorporated into modern aerospace vehicles for monitoring and controlling the vehicle structure performance while in flight, and streamline the ground processing of the vehicle structure components. It helps to detect uncertain vehicle dynamics, failure and damage of vehicle structures, and is able to react and compensate, whenever possible, for failures so that the impact of a failure can be minimized, the reliability of the vehicle is improved, and the operation life of the vehicle is prolonged. In this paper, the design and application of a VSHM system especially for safety-critical structures of new generation aerospace vehicles is studied. The composing and functions of the system is introduced, as well as the system capability to respond to failures and damage of both metallic and composite structures. By using this VSHM, the next generation aerospace vehicles are expected to radically reduce the cost of accessing space, thus enabling a broad range of further exploration of the space. The VSHM will play an important role in the next generation aerospace vehicles.