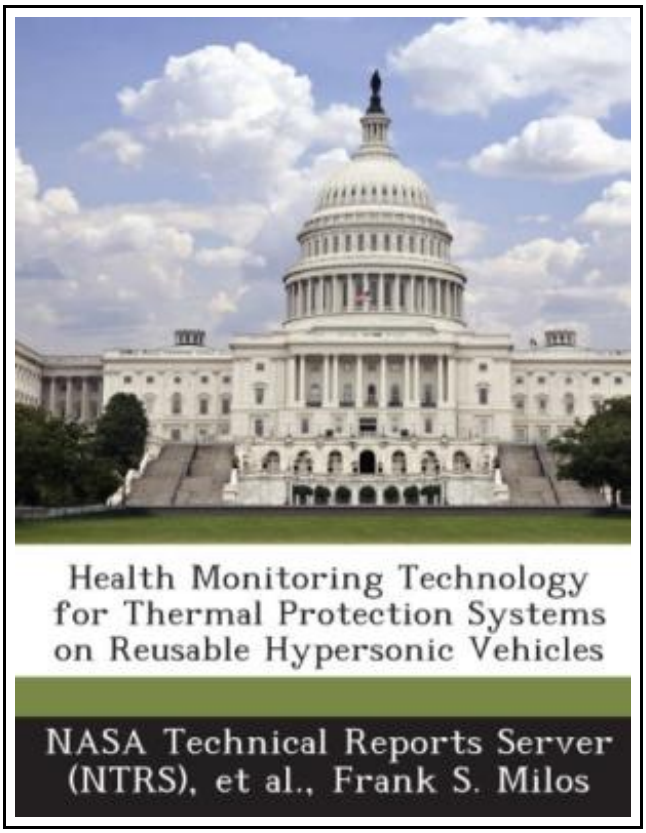
Health Monitoring Technology for Thermal Protection Systems on Reusable Hypersonic Vehicles



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BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 24 pages. Dimensions: 9.7in. x 7.4in. x 0.1in.Integrated subsystem health diagnostics is an area where major improvements have been identified for potential implementation into the design of new reusable launch vehicles (RLVs) in order to reduce life cycle costs, to increase safety margins, and to improve mission reliability. This talk summarizes a joint effort between NASA Ames and industry partners to develop rapid non-contact diagnostic tools for health and performance monitoring of thermal protection systems (TPS) on future RLVs. The specific goals for TPS health monitoring are to increase the speed and reliability of TPS inspections for improved operability at lower cost. The technology being developed includes a 3-D laser scanner for examining the exterior surface of the TPS, and a subsurface microsensor suite for monitoring the health and performance of the TPS. The sensor suite consists of passive overlimit sensors and sensors for continuous parameter monitoring in flight. The sensors are integrated with radio-frequency identification (RFID) microchips to enable wireless communication of-the sensor data to an external reader that may be a hand-held scanner or a large portal. Prototypes of the laser system and both types of subsurface sensors have been developed. The laser scanner was tested on Shuttle Orbiter Columbia and was able to dimension surface chips and holes on a variety of TPS materials. The temperature-overlimit microsensor has a diameter under 0. 05 inch (suitable for placement in gaps between ceramic TPS tiles) and can withstand 700 F for 15 minutes. This item ships from La Vergne,TN. Paperback.

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