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## Propulsion Ivhm Technology Experiment

By Amy K Chicatelli

Bibliogov, United States, 2013. Paperback. Book Condition: New. 246 x 189 mm. Language: English . Brand New Book \*\*\*\*\* Print on Demand \*\*\*\*\*.The Propulsion IVHM Technology Experiment (PITEX) successfully demonstrated real-time fault detection and isolation of a virtual reusable launch vehicle (RLV) main propulsion system (MPS). Specifically, the PITEX research project developed and applied a model-based diagnostic system for the MPS of the X-34 RLV, a space-launch technology demonstrator. The demonstration was simulation-based using detailed models of the propulsion subsystem to generate nominal and failure scenarios during captive carry, which is the most safety-critical portion of the X-34 flight. Since no system-level testing of the X-34 Main Propulsion System (MPS) was performed, these simulated data were used to verify and validate the software system. Advanced diagnostic and signal processing algorithms were developed and tested in real time on flight-like hardware. In an attempt to expose potential performance problems, the PITEX diagnostic system was subjected to numerous realistic effects in the simulated data including noise, sensor resolution, command/valve talkback information, and nominal build variations. In all cases, the PITEX system performed as required. The research demonstrated potential benefits of model-based diagnostics, defined performance metrics required to evaluate the diagnostic system, and...



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