

FAST HYBRID TESTING OF FUTURE SPACE FLIGHT HARDWARE

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As part of the new space vision for space exploration NASA astronauts will return to the moon, and this time to stay. There will be building of outposts and preparing for journeys to Mars and beyond. Clearly, new lines of hardware with no prior flight heritage will be required to support such missions. This paper suggests Hybrid Testing to be the method of choice for qualifying future flight hardware. During test, the physical unit (test subsystem) interacts instantaneously with a host subsystem represented analytically via a computer model. The interface conditions between the physical and computational subsystems are imposed during test. Also in this paper, the case for a "Hybrid Shaker" capable of dealing with a test end unit and an analytical model simultaneously is made. It is shown that Hybrid testing has the advantage of reducing development time, lifting excess of conservatism imposed on subsystems, skipping intermediate qualification testing and providing early identification of low margin spots in a large systems.

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