

LUNAR ATMOSPHERE AND DUST ENVIRONMENT EXPLORER INTEGRATION AND TEST

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ABSTRACT

Integration and test (I&T) of the Lunar Atmosphere and Dust Environment Explorer (LADEE) is presented. A collaborative NASA project between Goddard Space Flight Center and Ames Research Center, LADEE's mission is to explore the low lunar orbit environment and exosphere for constituents. Its instruments include two spectrometers, a dust detector, and a laser communication technology demonstration.

Although a relatively low-cost spacecraft, LADEE has I&T requirements typical of most planetary probes, such as prelaunch contamination control, sterilization, and instrument calibration. To lead to a successful mission, I&T at the spacecraft, instrument, and observatory level must include step-by-step and end-to-end functional, environmental, and performance testing.

Due to its compressed development schedule, LADEE I&T planning requires adjusting test flows and sequences to account for long-lead critical-path items and limited spares. A protoflight test-level strategy is also baselined. However, the program benefits from having two independent but collaborative teams of engineers, managers, and technicians that have a wealth of flight project experience.

This paper summarizes the LADEE I&T planning, flow, facilities, and probe-unique processes. Coordination of requirements and approaches to I&T when multiple organizations are involved is discussed. Also presented are cost-effective approaches to I&T that are transferable to most any spaceflight project I&T program.