SPACE EXPLORATION SYMPOSIUM (A3)
Moon Exploration – Part 2 (2B)

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NASA'S ROBOTIC LUNAR LANDER PROJECT UPDATE

Abstract

Since early 2008, the Robotic Lunar Lander Development Project, a joint effort of the NASA Marshall Space Flight Center and The Johns Hopkins University Applied Physics Laboratory has been conducting mission studies and performing risk reduction activities in support of the Lunar Quest Program, a lunar science research program within NASA's Science Mission Directorate. The primary emphasis has been to establish anchor nodes of the International Lunar Network (ILN), a network of lunar science stations envisioned to be emplaced by multiple nations. This network consisting of four or more nodes carrying multiple instruments would address key scientific questions associated with the geophysical composition and history of the moon. Additional mission studies have been conducted to support other objectives of the lunar science community and extensive risk reduction design and testing has been performed to advance the design of the lander system and reduce development risk for flight projects. Significant refinement and analysis has been conducted resulting in a mature lunar lander concept. This paper describes the current status of the ILN Anchor Nodes mission and its place in the recently unveiled planetary science decadal study. The results to date of the lunar lander development risk reduction efforts including high pressure propulsion system testing, structure and mechanism development and testing, long cycle time battery testing and combined GNC and avionics testing will be addressed. The most visible elements of the risk reduction program are two fully autonomous lander flight test vehicles. The first utilized a high pressure cold gas system with limited flight durations while the subsequent test vehicle utilizes hydrogen peroxide propellant resulting in significantly longer flight times and the ability to more fully exercise flight

sensors and algorithms. The flight testing of the hydrogen peroxide test vehicle will have been completed and the test results will be discussed.