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IAF SPACE EXPLORATION SYMPOSIUM (A3)
Moon Exploration – Part 1 (2A)

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VIPER: SYSTEMS INTEGRATION STATUS

Abstract

The NASA Artemis Program plans to return humans to the Moon to stay. Extended human stays on the Moon will require substantial resources to sustain human presence, requiring continuous supplies delivered from the Earth. However, if some of the resources were indigenously available, Earth logistical requirements could be substantially reduced by "living off the land" with in-situ lunar resources.

The LCROSS, LRO and other missions have confirmed the presence of lunar resources such as volatiles in polar regions. The next step is to understand the scientific nature and physical distribution of those candidate resources, as well as how the water got there and why it is still there. Those local volatiles could be processed into propellants and human life-supporting needs, reducing risk of maintaining a permanent human presence on the Moon.

The Volatiles Investigating Polar Exploration Resource (VIPER) is a surface mobility scientific platform, designed to spend 100 days mapping and surveying four different Ice Stability Regions to understand the scientific nature and distribution of water and other volatiles. VIPER will also provide scientific mineralogical context of the lunar regolith, such as the presence of silicon and light metals in lunar regolith, providing a composite picture of resource availability and sustainment.

This paper will discuss the latest development progress by the VIPER team, following our initial introduction to this mission at IAC2021. The VIPER team has moved from design and development, into manufacturing, subsystem, and system integration of the flight rover! VIPER is managed within NASA's Science Mission Directorate (SMD), utilizing the Commercial Lunar Payload Services (CLPS) delivery model with partner, Astrobotic, Inc.