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SPACE EXPLORATION SYMPOSIUM (A3)
Mars Exploration – Part 1 (3A)

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PESSEF: PLANETARY ENVIRONMENT SURFACE AND SUBSURFACE EMULATION FACILITY

Abstract

The objective of this paper is the description of the Planetary Environment Surface and Subsurface Emulation Facility (PESSEF) facility in terms of scenario, major requirements, elements, Martian and Lunar simulant for an indoor rover facility, positioning and modeling and configuration. The design and accommodation of PESSEF has been elaborated taking into account some ground rules and considerations like its accommodation in the ALTEC infrastructure, which is feasible and does not imply severe constraints and impacts on the existing building, services and infrastructures. In addition the maximum utilization of the existing structures and services is allowed and considered together with the utilization of standard equipment. The PESSEF design is also addressed to minimize the operational and maintenance costs. The Mission of the PESSEF will be to allow the execution of activities aimed to: – The confirmation of the suitability of future probe and robotic systems design to the target environment.

– The verification of the compatibility of the design of the probes and their operations, the support of the training of the ground operators.

– The execution of significant outreach and education activities. The future robotic explorations will require the development and research about sub-systems not limited to the locomotion aspects and for which specific new laboratories or facilities could be useful (power generation, sample containment, rendezvous, etc.).

– The support to the development of technology elements, enabling meaningful real hardware testing and testing of planetary surface elements (landers, egress systems, rovers, robotic arms, instruments).