

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

Author: Mr. Matteo Savoia

Leonardo S.p.A., Italy, matteo.savoia@leonardocompany.com

Mr. Andrea Rusconi

Leonardo S.p.A., Italy, andrea.rusconi@leonardocompany.com

Dr. Marco MOLINA

Leonardo Spa, Italy, marco.molina@leonardocompany.com

Mr. Marco Peruzzotti

Positech c/o Leonardo, Italy, marco.peruzzotti.ext@leonardocompany.com

Mr. Christian Panza

Info Solution c/o Leonardo, Italy, christian.panza.ext@leonardocompany.com

Dr. Simeon Barber

Open University, United Kingdom, s.j.barber@open.ac.uk

Mr. Richard Fisackerly

European Space Agency (ESA), The Netherlands, Richard.Fisackerly@esa.int

Dr. James Carpenter

European Space Agency (ESA), The Netherlands, james.carpenter@esa.int

Mr. FRANCO BOLDRINI

Leonardo S.p.A, Italy, franco.boldrini@leonardocompany.com

PROSPECT: LUNAR VOLATILES PROSPECTING ON BOARD OF LUNA-27

Abstract

Leonardo's development of a robotic package aimed at prospecting lunar resources is going on. The collaboration between ESA and ROSCOSMOS gave birth to the European PROSPECT package to be installed on board of Luna-27 spacecraft. PROSPECT is a robotic and scientific package consisting of two main elements: ProSEED (PROSPECT Sample Excavation and Extraction Drill) and ProSPA (PROSPECT Processing and Analysis). ProSEED is the drilling robot designed to reach a maximum depth of 1.2 m and capable of collecting lunar soil samples for both the Russian and European instrument suites. ProSPA, developed by Open University, is the actual European instrument suite that will be able to receive solid samples from ProSEED, extract volatiles, identify and quantify the extracted volatiles. In order to accomplish the scientific objectives, it is very important that both ProSEED and ProSPA will work together to minimize the loss of volatile content expected in the lunar soil of polar regions. Such icy content is typically put in danger by the drilling, sampling and handling operations performed within the lunar environment. To support the definition of the right operational strategy is then important to accurately model all the phases, with the aid of numerical simulations which try to estimate the temperature history of the sampled material. The proposed paper will give an overview of the PROSPECT development and the activities in progress to support the definition of a successful design and execution of the mission.