IAF SPACE EXPLORATION SYMPOSIUM (A3)
Interactive Presentations - IAF SPACE EXPLORATION SYMPOSIUM (IP)

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EVALUATION OF LIBS TECHNOLOGY FOR QUALITY ASSESSMENT OF LUNAR IN-SITU SOURCED WATER FOR DRINKING AND ELECTROLYSIS REQUIREMENTS

Abstract

In-situ resource utilization plays key role for sustainable long-term human presence in space. Technologies are being developed to source water from the ice present in constantly shadowed parts of lunar craters. Water is a very precious resource, as it can be used as a drinking water for crews, for plant cultivation on the Moon and finally it could be decomposed into hydrogen and oxygen for further utilization as a spacecraft fuel.

Practical utilization of the water sourced from ice mixed with lunar regolith requires reliable, robust, effective and scalable methods for water quality assessment. Laser Induced Breakdown Spectroscopy (LIBS) was evaluated whether it meets the mentioned criteria in the context of lunar applications, what are its main advantages and disadvantages, feasibility and limitations of utilizing discussed technology for water quality monitoring lunar environment. Proposed paper discusses employing the LIBS in space water quality monitoring systems, compared with other methods allowing to assess the water quality for drinking and electrolysis applications requirements.

Above mentioned research is a part of the *Validation of Lunar Water Extraction and Purification Technologies for In-Situ Propellant and Consumables Production* (LUWEX) Project, financed within Horizon Europe programme.