IAF MATERIALS AND STRUCTURES SYMPOSIUM (C2)
Interactive Presentations - IAF MATERIALS AND STRUCTURES SYMPOSIUM (IP)

Author: Mr. Vipul Mani
TU Berlin, Germany, mani.vipul7@gmail.com

Mr. Nicolás Sepúlveda
Universidad de Concepción, Chile, nsepulveda2017@udec.cl
Mrs. Ilaria Merli
ETHZ, Switzerland, ilaria.space@outlook.com
Ms. Chiara Armandi
University of Surrey, Italy, chiararmandi@gmail.com
Ms. Orlandi Veronica
Ecole Polytechnique Fédérale de Lausanne (EPFL), Italy, veronica.orlandi@epfl.ch

ORIGAMI-INSPIRED DEPLOYABLE SOLAR REFLECTORS FOR MISSION LIFETIME EXTENSION OF ROBOTIC VEHICLES FOR LUNAR EXPLORATION

Abstract

Humans have successfully landed on the lunar surface six times using technology from the 1960s. The last crewed mission to the moon was Apollo 17 in 1972 and we've not been back in over 50 years. The Artemis space flight program aims to land the first woman and the next man on the moon by the year 2024 and with it, begins a new generation of lunar exploration and the beginning of Artemis base camp which could be built on the moon by 2028. The Permanently Shadowed Regions (PSRs) of around the Shackleton Crater on the Moon's South Pole is a region of great interest for space agencies around the world. NASA's Lunar Reconnaissance Orbiter (LRO) spacecraft has returned data that indicate ice may make up as much as 22 percent of the surface material in craters located on the Moon's south pole. The water-ice present in craters is of great scientific value as it can be extracted and broken into its constituent particles which can later be used as rocket fuel. Further, the water-ice can also be refined and used as drinking water for humans on the Moon. But, being in the PSRs of the Lunar South Pole, extraction of the water-ice possesses a functional problem. Without sunlight, the batteries on a mining rover would only last a few minutes. Added to the problem of PSRs is the issue of lunar night that lasts for 14-Earth$_{d}aysandthetemperaturedropsdowntoaslowas-$
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