

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

Author: Dr. Teppei Okumura
Japan Aerospace Exploration Agency (JAXA), Japan

Mr. Yoshiyuki Murakami
Japan Aerospace Exploration Agency (JAXA), Japan

Prof. Kazuhiro Toyoda
Kyushu Institute of Technology, Japan

Dr. Hitoshi Naito
Japan Aerospace Exploration Agency (JAXA), Japan

EFFECT OF LEVITATION LUNAR REGOLITH TO THE PERFORMANCE OF SOLAR ARRAY
PANEL

Abstract

Japan Aerospace Exploration Agency plans to several lunar surface exploration missions. In the viewpoint from electric power system, we need to solve several issues such as extreme low temperatures and lunar regolith those are not considered on conventional earth orbit satellites. In this presentation, we focus on the effect of levitation regolith to the performance of solar array panel. On the lunar surface, the photoelectron emission due to ultraviolet light and secondary electron emission due to high energy electron bombardment charge the lunar regolith. The charging distribution on the lunar surface cannot be uniform because the surface is not plane, therefore, the lunar regolith levitates due to electrostatic force. Several research reports the mechanism of levitation because of those charging source. Although we do not have the simulated environment in the vacuum chamber to make the simulants levitate, we need to evaluate the effect on the performance of solar array panel to design the lunar rover. In this presentation, we present the effect of the simulants which is levitating under atmospheric condition.