JASMAC
Conference of the Japan Society of Microgravity Application

P12

宇宙建築におけるその場資源を用いた金属造形に関する研究：集積レゴリスの融解・凝固過程の数値シミュレーション

Metal manufacturing for space architecture by Lunar regolith: Numerical simulation of melting and solidification process of graveled regolith

古山史萌 [1]，白鳥英 [2]，小澤俊平 [3]，永野秀明 [2]，島野健仁郎 [2]，
Shiho KOYAMA[1], Suguru SHIRATORI[2], Shumpei OZAWA[3], Hideaki NAGANO[2], Kenjiro SHIMANO[2]

1 東京都市大学大学院，Graduate School, Tokyo City University,
2 東京都市大学，Tokyo City University,
3 千葉工業大学，Chiba Institute of Technology,

In recent years, space development has become more and more active around the world. Japan is also planning a long-term manned lunar exploration in about 10 years [1]. To realize such long-term activities, it is necessary to construct habitats. For sustainable development, the construction should be completed locally [2]. This study proposes a construction method to bond regolith with molten regolith as shown in **Fig.1**, which can be collected on the Moon. To check whether this construction process is realized, we estimate of the order of the penetration rate of the molten metal and the diffusion rate of the heat flowing into the void. Then, the melting and re-solidification process of regolith will be investigated.

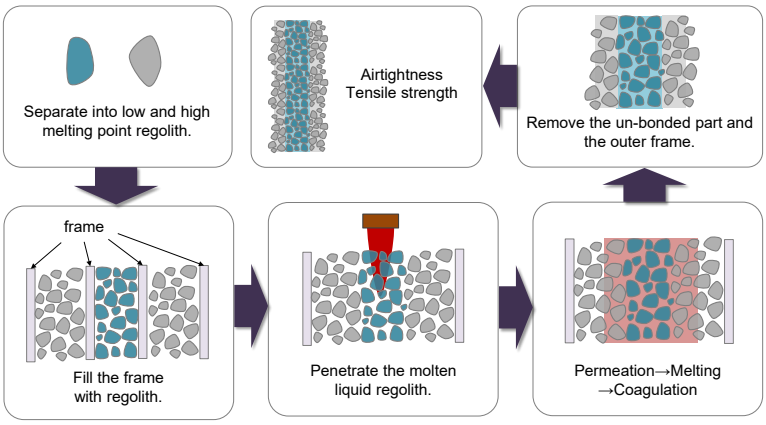

Fig.1 The proposed construction method using the regolith that can be collected on the Moon.

References

1) Space Exploration Systems Engineering Unit, International Space Exploration Center, JAXA: Proposal for Japan's International Space Exploration Scenario (Public Version), 2019, 8.
2) "Lunar Habitation", Foster + Partners, 2012, https://www.fosterandpartners.com/projects/lunar-habitation/, (Aug. 31, 2021)