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Temperature Dependence of Al_2O_3 Ablation Plume on Ambient Pressure and Laser Intensity by Laser Diode toward Lunar Regolith Utilization KAZUNE UESUGI, Department of Engineering , Shizuoka University, RYOHEI OISHI, Department of Mechanical Engineering , Shizuoka University, MAKOTO MATSUI, Department of Engineering , Shizuoka University — Among the lunar surface regolith, alumina is confirmed to be present in about 10% in the whole moon, especially in the highlands about 23%, which is one of the representative substances. Although alumina itself is not a very versatile material, reduced aluminum has a lot of applications for future lunar activities including a base construction. The laser ablation is one of the promising reduction methods because it does not require reducing agency. In this study, we investigated the temperature dependence of the ablation plume on ambient pressure and the laser intensity using 1 kW class continuous-wave diode laser. As a result, the plume temperature increased with the ambient pressure and the laser intensity in the range of 3500 K to over 5500 K.

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