Abstract Submitted
for the GEC20 Meeting of
The American Physical Society

Effect of Helium Mixing on Temperature distribution of Krypton Laser Sustained Plasma[1] KAZUYOSHI ISHIKAWA, RYOKI NIWA, Department of Engineering, Shizuoka University, KOTA OKAMOTO, Department of Mechanical Engineering, Shizuoka University, MAKOTO MATSUI, Department of Engineering, Shizuoka University — Laser propulsion is a novel space transportation system that obtains thrust through the laser sustained plasma (LSP) generated by the focused laser beam. This system is expected to have a higher specific impulse than arc jet system and long lifetime because of no electrode erosion. Considering the adaption of LSP to the space transportation system, it is necessary to generate LSP using a diode laser which has high energy conversion efficiency. In our previous study, the diode laser sustained plasma using the mixing gas was successfully generated. The mixing gas consists of krypton which is relatively lower ionized energy and helium which makes specific impulse high because it is the lower atomic weight. However, in order to evaluate the performance as a space transportation system, it must obtain the temperature distribution of LSP. In this study, we investigated and report the effect of helium mixing on temperature distribution of krypton laser sustained plasma.

[1]This work was supported by JSPS KAKENHI Grant Number JP18H03812.

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Date submitted: 11 Jun 2020 Electronic form version 1.4