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Fundamental Study for Laser Ablation Plasma Electrostatic Acceleration KAEDE YANO, TAKATO OGASAWARA, AYAKA HAMADA, HIDEYUKI HORISAWA, Tokai University, HARUO SHINDO, Plasma Research Laboratory CO.LTD — Laser electric hybrid acceleration system is composed of a solid planar propellant and an accelerating electrode with a single circular hole in a copper plate. Focusing a laser pulse onto the surface of the propellant a laser ablation plasma, or LAP is generated and then supplied into the accelerating channel and accelerated by electrode with the electrostatic field. However, the spatial structure and temporal behavior of LAP are complicated. In addition, to realize higher performance of the propulsion system, it is necessary to apply the electrostatic field appropriately after diagnosing these features in detail. Therefore, in this research, to achieve the optimum electrostatic acceleration, measurement of plasma parameters of LAP was conducted using an emissive probe. In this study, we measured the characteristics of plasma which mainly include plasma space potentials, electron temperatures, electron densities, etc. For the plasma diagnostics, we used emissive probes that are suitable for plasma space potential measurement. From the results, it was shown that the plasma potential and electron temperature rose up to 14 V and 20 eV, respectively, in 30 ms after laser ablation.

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