

Abstract Submitted
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Diagnostics of Rotational Temperature and Mean Electron Energy Distribution of DC Glow Discharge Using Spectral Image Processing DAISUKE SHIMIZU, RYO SASAMOTO, TAKAO MATSUMOTO, YASUJI IZAWA, KIYOTO NISHIJIMA, Fukuoka University — The non-thermal plasma has been used in various application fields of manufacturing industry such as surface reforming, plasma etching, deposited film forming. The gas temperature and electron energy in non-thermal plasma play a key role of production of active species. Therefore, it is essential to understand the properties of non-thermal plasma for effective plasma applications. In this study, the two-dimensional rotational temperature and mean electron energy distribution of DC glow discharge plasma under various air pressures were observed using spectral image processing. Rotational temperature distribution was estimated from the emission intensity ratio of head and tail of 2nd positive system band of N_2 (0, 2). On the other hand, mean electron energy was estimated from the emission intensity ratio of 2nd positive system band of N_2 (0, 2) and 1st negative system band of N_2^+ (0, 0). The each spectral images were taken by an ICCD camera with narrow band-pass filters respectively. As a result, the dependences of rotational temperature and mean electron energy distribution in DC glow discharge on ambient air pressure were clearly observed using spectral image processing.

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