

Abstract Submitted
for the GEC11 Meeting of
The American Physical Society

Influence of microwave electric field on H_β broadening in atmospheric pressure microwave plasma¹ HIROTAKA TOYODA, TAKUYA MURASE, Department of Electrical Engineering and Computer Science, TATSUO ISHIJIMA, Plasma Nanotechnology Research Center, Nagoya University — Atmospheric pressure plasmas have been given much attention because of its cost performance and various possibilities for industrial applications. Although Stark broadening of emission line is commonly used for the electron density measurement in atmospheric pressure plasmas, pulsed operation may influence the line width due to the applied electric field, especially at the early stage of the plasma ignition. In this study, temporal and spatial variations of H_β spectra from an atmospheric pressure microwave plasma was measured using optical multi-channel analyzer with a gated CCD detector. From the time-resolved measurement, difference of the line widths between parallel and perpendicular polarizations of the H_β emission was observed at the early stage of plasma ignition, suggesting the influence of applied electric field on the H_β spectra. Spatial variation of H_β spectra across the discharge gap was measured and increase of both the microwave electric field and the emission intensity was observed in the vicinity of electrodes.

¹This work is supported by Grant-in-Aid for Scientific Research (No.21540509) from the MEXT, Japan.

Hiroataka Toyoda
Department of Electrical Engineering and Computer Science

Date submitted: 14 Jul 2011

Electronic form version 1.4