Influence of microwave electric field on H\textsubscript{\beta} broadening in atmospheric pressure microwave plasma\textsuperscript{1} 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\textsubscript{\beta} 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\textsubscript{\beta} emission was observed at the early stage of plasma ignition, suggesting the influence of applied electric field on the H\textsubscript{\beta} spectra. Spatial variation of H\textsubscript{\beta} 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.

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