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**Space- and Time-Resolved Measurement of  $H_\beta$  Emission Spectrum in Atmospheric-pressure Pulsed Microwave Plasma** AZUMI KAMATA, TATSUO ISHIJIMA, HIROTAKA TOYODA, Nagoya Univ. — Atmospheric pressure plasmas have been given much attention because of its cost performance and various possibilities for industrial applications. In general, atmospheric plasmas are maintained by the short pulse DC or RF high voltages owing to prevent from arc discharges. To optimize the performance of the atmospheric pressure plasma for their applications, diagnostics and control the plasma are indispensable. Although Stark broadening of emission line is commonly used for the electron density measurement, pulsed operation may influence the line width due to the applied electric field, especially at the early stage of the plasma ignition. In this paper, temporal and spatial variations of  $H_\beta$  spectra from an atmospheric pressure microwave plasma were measured. From the time-resolved measurement, difference of the line widths between parallel and perpendicular polarizations of the  $H_\beta$  emission was observed at the early stage of plasma ignition, suggesting the influence of applied electric field on the  $H_\beta$  spectra. To obtain both the applied electric field and the plasma density from the experimental result, line widths at various combinations of the plasma density and the electric field were calculated. Spatial profiles of emission spectra inside the slot antenna will also be presented.

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