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Diagnostics of Dielectric Barrier Microdischarges Using Laser Thomson Scattering NIMA BOLOUKI, KENTARO TOMITA, YUKIHIKO YAMAGATA, KIICHIRO UCHINO, Kyushu University — We have been developing a laser Thomson scattering technique to apply for dielectric barrier pulsed discharges. The light source of LTS is the second harmonics of a Nd:YAG laser with a energy of 8 mJ. Also a triple grating spectrometer which is equipped with a spatial filter for eliminating Rayleigh and stray lights is used to measure LTS spectra. The dielectric barrier discharge is generated in neon gas at around atmospheric pressure of 400 Torr by applying the bipolar pulses at a frequency of 50 Hz with a peak value of 3 kV. The electrode set in this experiment is consisted of a needle electrode and a hemispherical electrode with an inter-electrode gap of 0.5 mm. Teflon as a dielectric layer is coated on the hemispherical electrode with a thickness of 200 μm. In this experiment, the peak current of discharge was about 3 A and the total electric charge that flows through the discharge channel was estimated to be 20-30 nC. Finally, we applied LTS successfully as a diagnostics method in DBD. Temporal evolution of electron density and temperature could also be measured. It has been investigated that the peak values of electron density and electron temperature at the center of the pulsed filament discharge to be $(1.0 \pm 0.1) \times 10^{22}$ m^{-3} and 2.62 ($\pm$0.2) eV.

Nima Bolouki
Kyushu University

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