

Abstract Submitted
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Diagnostics of Pulsed Powered Microplasma Discharge in N₂ by Emission Spectroscopy MARIUS BLAJAN, KAZUO SHIMIZU, Shizuoka University, Innovation and Joint Research Center — The aim of this paper is to analyze the emission spectrum of the microplasma, which is atmospheric pressure nonthermal plasma, generated by a pulse power supply in nitrogen gas. Microplasma discharge in N₂, generated at relatively low discharge voltages around 1 kV, was investigated with an ICCD camera, a spectrometer and a photomultiplier tube. A Marx Generator with MOSFET switches was developed and used as a pulse power supply. It has a negative output up to -2 kV, rise time 100 ns, pulse width 1 μ s. Discharge current was confirmed at rising point of discharge voltage. About -2.5 A was obtained at -1.5 kV for negative pulse. Emission spectrum showed N₂ Second Positive System band (N₂ SPS), N₂⁺ First Negative System Band (N₂⁺ FNS) and N₂ First Positive System band (N₂ FPS). Lifetime emission signal of N₂ SPS peak of 337.1 was about 60 ns. Temperature calculation showed that microplasma is non equilibrium plasma due to the inequality $T_e > T_{vib} > T_{rot}$.

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