Abstract Submitted
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Afterglow Measurement of Vibrationally Excited Nitrogen in an Apparent E/N Controlled Plasma by Non-Self-Sustaining DC Discharge Plasma Source[1] YUKI KUNISHIMA, KEISUKE TAKASHIMA, TOSHIRO KANEKO, Tohoku University, INTERDISCIPLINARY RESEARCH CENTER FOR NON-EQUILIBRIUM PLASMA (IRCNP) TEAM — A Non-Self-Sustaining DC (NSS DC) discharge plasma source aiming for efficient nitrogen vibrational excitation by apparent reduced electric field (E/N) control has been developed. This plasma source consists of two power sources: a nanosecond pulse plasma generator and a DC power supply. The applied DC voltage controls the apparent E/N suitable for efficient nitrogen vibrational excitation. The temporal evolution of the nitrogen rotational temperature during the discharge is estimated from a nitrogen second positive emission. The decay of nitrogen vibrational distribution after the discharge burst is observed up to v = 4 by laser Raman spectroscopy, which indicates the decay time of a few milliseconds. And the vibrational excitation after the discharge is enhanced with the increase of the apparent reduced electric field increase. Further details will be discussed at the meeting.

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