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Repetitive nanosecond-pulsed discharge in high-pressure hydrogen environments TSUYOHITO ITO, KAZUNOBU KOBAYASHI, Osaka University, UWE CZARNETZKI, Ruhr-University Bochum, SATOSHI HAMAGUCHI, Osaka University — High pressure discharges have attracted much attention recently, and employment of a repetitive nanosecond-pulsed power is one of the promising methods for generating non-thermal discharges in high pressure environments. Electric field is one of the most important parameters in discharge dynamics, which, we believe, should be understood to improve their applications. In this paper, we study the dynamics of a repetitive (10 kHz) nanosecond-pulsed discharges, generated in high pressure (near atmospheric pressure) hydrogen environments, with measurements of the time-dependent electric field distributions. The measurements are performed by coherent Raman scattering (CRS) analysis of hydrogen molecules, induced by two nanosecond laser beams and the electric field. The experimental results show temporal effects of charges in the space (and/or on the dielectric barrier, when we employ a dielectric barrier discharge). More details revealed by optical emission studies and particle simulations will be presented.

Tsuyohito Ito
Osaka University

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