SPATIOTEMPORAL BEHAVIOR OF EXCITED XENON ATOM DENSITY IN THE $1S_5$ METASTABLE STATE ACCORDING TO NEW TYPE DOUBLE X-Y ELECTRODES STRUCTURE IN ALTERNATING CURRENTPLASMA DISPLAY PANEL

Y. H. KIM , Y. J. HONG, P.Y.OH and EUN HA CHOI
Dept. Of electrophysics / PDP Center
Charged Particle Beam and Plasma Laboratory
Kwangwoon University
rsztzt@naver.com

PDP uses the phosphor luminescence by VUV photons emitted from the excited Xe atoms in discharge plasma. Conventional AC-PDP using the coplanar electrodes structure have several problems as low brightness, luminous efficiency and so on. Currently, many researchers have studied the advanced various structure to improve the efficiency. In order to improve the luminescence characteristics of high-resolution plasma display panels (PDPs).

We have measured the excited Xe atoms density in the 1s5 metastable states by laser absorption spectroscopy in discharge cell with double X-Y electrodes. This experiment has shown the characteristic of the excited Xe atoms density which is relation to the visible light efficiency of PDP. We have observed the spatiotemporal behavior of excited Xe density in discharge cell with double X-Y electrodes. The maximum density of excited Xe atoms in the 1s5 in discharge cell with the conventional coplanar electrodes structure and double X-Y electrodes have been measured to be 9.3×10^{13} cm^{-3} and 2.1×10^{14} cm^{-3} at 8.55×10^{-7} s and 8.9×10^{-7} s respectively. New type double X-Y electrodes structure with the pressure of 400Torr has multiplied by about 2.3 times compared to the maximum density of excited Xe atoms in the 1s5 in discharge cell with the conventional coplanar electrodes structure. Thus, the new panel structure has potential for use in applications in Double X-Y electrodes PDP.

1. J. H. Seo, H. S. Jeong, J. Y. Lee, C. K. Yoon, J. K. Kim, and K. W. Whang, "Vacuum ultraviolet emission characteristics from He-Ne-Xe gas discharge in an alternating current plasma display panel cell," J. Appl. Phys., vol. 88, no. 3, pp. 1257-1262, Aug. 2000.

2. P. Y. Oh, J. H. Lee, S. H. Jeong, H. S. Moon, S. B. Lee, K. B. Song, Y. Jung, Y. K. Kim, G. Cho, H. S. Uhm, and E. H. Choi, "Measurement of excited Xe atoms density in alternating current plasma display panel by means of laser absorption spectroscopy", *IEEE Trans. Plasma Sci*., vol. 34, co. 2, pp. 317-325, Apr. 2006

* Work supported by a Government Agency.