[V-15]

One Dimensional Fluid Simulation of AC-PDP

Y. K. Shin, W. Zhou, and J. K. Lee
Department of Physics, Pohang University of Science and Technology, Pohang,

We present a self-consistent fluid model of AC plasma display panel cell. The model uses continuity equations of the electron, ion and neutral particles, along with the electron energy-balance equation for He, Xe, and Ne gases. These equations are coupled with Poisson's equation in a fashion similar to our model on large-area TCP plasma[1]. Because of high collision frequency the momentum balance equation can be replayed by an form of particle flux having contribution due to drift and diffusion. The electron temperature is assumed to be unifrom and constant in many simulation of AC-PDP cell although it is not within the cell during the discharge process. The temperature of the bulk part is different with that near dielectric layer. For the case having the electron-temperature evolution, rate coefficients are the functions of temperature. The secondary emission effect plays an important role of maintaining the discharge. The constant coefficient was used although the value is a complex form of electric field and velocity. As the applied voltage increases, the discharge is initiated rapidly and the peak currents at the each dielectric layer also increase. After the potential drop across the gas gap has occurred, the electron distribution is diffusion dominant. The detailed physical, electrical, and optical properties of an AC-PDP will be discussed.

[1] J. K. Lee, L. Meng, Y. K. Shin, H. J. Lee, and T. H. Chung
Jpn. J. Appl. Vol 36(1997) pp. 5714-5723
T. H. Chung, H. J. Yoon, and J. K. Lee
Jpn, J. Appl. Vol 36(A), 2874-2882 (1997)