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Numerical simulation for high luminous efficiency in coplanar AC-PDP

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Plasma display panels have grown remarkably over the past decade. Although there has been much technological advancement in terms of high speed driving, image quality, and mass production, the improvement in luminous efficiency and the reduction of power consumption still remain issues In order to compete with cathode ray tubes (CRTs) and liquid crystal displays (LCDs), the efficiency of PDPs must progress to at least 3 lm/W. In this study, we show a new PDP cell structure for high luminous efficiency by inserting an extra electrode between two sustain electrodes and varying the driving pulse. In this model, we tried to make a long discharge path and form it near the phosphor surface without impairing the phosphor itself. As a result, in our 2D and 3D fluid simulations[1,2] the luminous efficiency of new model is improved by about 2.6 times as compared to that of conventional model.

[Reference]

1. H.C. Kim, S.S. Yang, and J.K. Lee, Three-dimensional self-consistent radiation transport model for the fluid simulation of plasma display panel cell, J. Appl. Phys., 93, 9516 (2003)
2. S.S. Yang, H.C. Kim, S.W. Ko, and J.K. Lee, Application of two-dimensional numerical simulation for luminous efficiency improvement in plasma display panel cell, IEEE, Trans. Plasma Sci. (to appear in Aug, 2003)