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Simulation model for analyzing voltage-current characteristics of the barrier type lamp filled with Hg-Ar gas YOSHIO WATANABE[1], Kanagawa University Professor, TOMOHIRO YAMAGUCHI[2], RYOSUKE IMADA[3], Kanagawa University — The simulation model for DBD lamp filled with Hg-Ar gas is studied. The straight tube filled with Hg and Ar gases is employed as a lamp. Three kinds of applied voltage waveforms at high frequency are applied between the pair of stripe electrodes attached on the outside of the tube. One dimensional model is employed. Ionization frequency based on Townsend ionization coefficient is employed in this model. A try-and-error method is employed to estimate the value of each coefficient, and the calculated waveform is compared with the measured current waveform. The values by which the most similar current waveform to the measurement is obtained are selected as appropriate values. Using these coefficient values, the discharge current waveforms by the applying voltage with triangular waveform and trapezoidal waveforms are calculated and compared with the measured current waveforms. Good agreements between the calculation and the measurement in discharge current waveform are obtained for three types of applied voltage waveform. Then, the distributions of electric field, electron density and ion density in the discharge space are calculated. It is shown that the space charge layer is formed on the glass tube wall and ionization takes place mainly in the space charge layer.

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