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Malter effect in thin ITO films

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Keywords

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Abstract

The subject of the study was field influence on electron emission into vacuum from ITO films deposited on glass surface. The films were deposited onto both surfaces of the glass and examined using the Malter effect controlled by electric field. One of the layers was the field electrode and the other was treated as the electron emitter. The bias voltage was applied to the field electrode. The analysis was carried out at a pressure of 10^{-5} Pa. Dependences of the secondary emission coefficient on the bias voltage and energy distributions of secondary electrons were determined. The diagrams obtained are characterized by high non-monotonic behaviour. The voltage pulse amplitude spectra were recorded in the multichannel amplitude analyzer. It has been found that pulses count depends exponentially on the bias voltage. The emission efficiency at the same inducing field is affected by the state in which the sample was before the measurement. This means that the field induced electron emission shows hysteresis-like behaviour. The existence of this effect proves that the electric field causes some irreversible changes in the electron emitting ITO layer.

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