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Cathodes with increased thermoelectronic emission properties

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The phenomena of electronic emission, in general, and thermoelectronic emission, in particular, seems that have already been studied well enough and there is nothing left to do. The electron beam, as a tool in the processing of materials is very convenient, because it does not cause changes in chemical composition and ensures processing in micrometric and nanometric scales.

It is experimentally demonstrated in this paper that the intensity of thermoelectronic emission current can be increased up to 10 times by micrometric changes in the geometry of the cathode active surface. It was also found that the artificially created asperities on the active surfaces of the cathodes also serve as concentrators of the electric fields. At the same time, the extraction of nanometric asperities from the micrometric ones further increases the active area of the thermoelectronic emission surface, and as a result the efficiency of the process.

Primary authors: GUZGAN, Dorin (Alec Russo Balti State University); TOPALA, Pavel (Alec Russo Balti State University); OJEGOV, Alexandr (Alec Russo Balti State University)

Presenter: TOPALA, Pavel (Alec Russo Balti State University)

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