

## THE FEATURES OF AN ARC DISCHARGE BURNING ON A TUNGSTEN CATHODE COATED WITH FUZZ NANOSTRUCTURES. \*

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Complex investigations of vacuum discharge with FUZZ coated tungsten cathode were done. The waveforms of vacuum arc current, interelectrode voltage drop and plasma luminescence were stored and analysed. The cathode spot erosion traces were obtained for small current short discharges.

It was found that the vacuum arc on the FUZZ cathode significantly more unstable. The discharge current and interelectrode voltage drop can arbitrarily change the burning modes. Sometimes the discharge become high voltage small current discharge with the discharge parameters close to glow discharge ones. This low current mode can be suddenly changed to the high current low voltage mode. The vacuum arc on the FUZZ cathode does not have the threshold current which is essential property of the vacuum arc discharge on the clean tungsten cathode.



Fig.1. The erosion traces leaved by five low current short-term discharges (10mks,4A)

The erosion traces on the cathode surface show the fractal nature of the cathode spots on the FUZZ coating. There are no traces of the second type of cathode spot well-defined craters. The erosion traces look like a chaotically melted surface. The more discharges were burn on the place the larger erosion traces area. It was established that the short-term discharges could not clean the area around a ignition point. The cathode spot usually burns on the FUZZ coating at the end of discharge.

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