

**BREAKDOWN IN THE ACCELERATING GAP OF ELECTRON SOURCES BASED  
ON AN ARC DISCHARGE AND A GRID STABILIZATION  
OF THE PLASMA EMISSION BOUNDARY**

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This work leads a theoretical research on the grid electrode potential with regard to the discharge plasma for its generation in the electron source with an arc discharge in the low-pressured gas. We investigated the influence of the positive feedback and breakdown mechanism in the mode of emission current enhancement. It has been shown that the main mechanism of breakdown in the accelerating gap of the given source is the interelectrode breakdown limiting beam threshold energy in a pressure range of 0.1–0.02 Pa. The defining factor of the interelectrode breakdown is the exceeding of plasma potential higher the critical value  $\varphi_{cr}$  of discharge ignition that depends on electron beam power density and gas kind.

**Keywords:** *electron source, accelerating gap breakdown, plasma grid stabilization, plasma potential.*