

# Recent results of hyperspectral diagnostics of a high-voltage spark with microstructured electrodes

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The results of complex registration of self-luminescence of the near-electrode region of the discharge simultaneously in several ranges of the spectrum from the near ultraviolet to the mid-IR (thermal) range are presented. The regions of primary ionization, regions of heating and expansion of the current channel, followed by dissipation of the deposited energy with a long relaxation phase are traced.

Such “hyperspectral” imaging allows visualizing the primary streamer corona and the subsequent discharge channel even in difficult environmental conditions, such as a discharge in an aerosol cloud (including such a kind as a “stalker”), near-electrode regions with powerful plasma formation from the electrode material with the formation of microdroplets and metal vapor.

An intensified camera with a photocathode sensitive in the range of 180–800 nm is used in the UV and visible regions, a specially prepared CMOS camera is used in the near-infrared region of 0.7–1.2  $\mu\text{m}$ , and a thermal imaging camera with a microbolometric VOx matrix is used in the mid-IR region (5–12  $\mu\text{m}$ , NETD < 40 mK) with a germanium lens.

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