Features of localization of polarized sources of microwave radiation flashes of extended spark discharge

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A radio measuring system based on ultra-broadband antennas (10 MHz - 6 GHz) is demonstrated, which makes it possible to study the spectral and spatial characteristics of radio emission sources in an extended (about 60 cm) high-voltage (about 1 MV) laboratory spark discharge [1]. In the report, we show that high-frequency radio emission has a complex spectral and temporal structure and manifests itself in the form of many short (lasting less than 1 ns) bursts. These spikes are observed at the stage of voltage growth in the discharge gap and when it reaches its maximum values. We also present the results of radio interferometric measurements, during which the discharge regions associated with the appearance of high-frequency radio emission were localized with centimeter accuracy [2]. Our study shows a close relationship between radio emission and intense streamer formation in the discharge gap [3]. The work was carried out with the financial support of the Russian Science Foundation (grant 23-19-00524).

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[2] Parkevich E V and [et al] 2023 *Journal of Applied Physics* **134**(15)

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