

Gas temperature spatial distribution in air SDBD discharge with additional extraction electrode measured by schlieren imaging

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Air temperature spatial distributions for surface dielectric barrier discharge (SDBD) system with an additional extraction electrode at biased voltage are determined by schlieren technique. The diagnostic technique was presented earlier in [1, 2]. An electrode system consisted of ten parallel aluminium foil strips on one side dielectric barrier (1 mm thickness, Al₂O₃ or AlN); a return electrode was grounded, it covered all the dielectric barrier plate side. The additional extraction electrode was separated of 1 cm air gap from the dielectric surface. The temperature distribution for SDBD excited by sinusoidal voltage with RMS of 2–3.5 kV across the aluminum nitride barrier with frequencies of ≈ 4 and ≈ 20 kHz and bias voltage at extraction electrode from -5 to $+5$ kV were investigated.

- [1] Pinchuk M E, Lazukin A V and Stepanova O M 2020 Air temperature spatial distribution in corona discharge with plane comb of metal rod electrodes obtained by schlieren technique *XXXV International Conference on Equations of State for Matter, Book of Abstracts* (Elbrus: IPSP RAS) p 314
- [2] Pinchuk M E, Lazukin A V and Stepanova O M 2021 Gas temperature spatial distribution in air SDBD discharge measured by schlieren imaging *XXXVI International Conference on Interaction of Intense Energy Fluxes with Matter, Book of Abstracts* (Elbrus: IPSP RAS)