

Abstract Submitted
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Peculiarities of local nitrogen SPS spectra emitted from streamer head YURI SHCHERBAKOV, LEONID NEKHAMKIN, All-Russian Electrotechnical Institute — We present results on spectroscopic studies of filamentary streamer discharge in short air gap in stage of primary streamer propagation. We have found that the mid-resolved nitrogen second positive system (SPS) spectra emitted from the primary streamer head changes essentially in form within some nanoseconds as compared to typical one. Namely, main peak near the band head formed by the P-branches of Pi3-to-Pi3 transition turns into a widened twin-peak hump, relative intensities of each sub-peaks change in time resulting finally in a quite usual one-peak form; with inessential modification of smooth short-wave part of the SPS-band as whole. For interpretation of this phenomenon we have considered: 1) dynamic breaking of the spin-axis coupling of the Pi3-states resulting in an appearance of Pi3(a)-to-Pi3(b)- and Pi3(b)-to-Pi3(b)-transitions additionally to a standard Pi3(a)-to-Pi3(a)-transition; 2) instrumental factors, including non-even illumination of the monochromator entrance slit due to very strong gradient of all physical parameters within streamer head; 3) Zeeman and Stark-effects. Stark-effect and instrumental peculiarities are supposed to be most adequate reasons for the phenomenon.

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