

Experimental study of a pulsed gas discharge initiated by the electric explosion of metal in the semi-open cylindrical chamber

**Vlasov A N[@], Dubkov M V, Burobin M A,
Cherkasova Yu V and Nikolaev A V**

Ryazan State Radio Engineering University, Gagarin Street 59/1, Ryazan 390005, Russia

[@] vlasov.a.n@rsreu.ru

An experimental study of a pulsed gas discharge in the semi-open cylindrical discharge chamber with diameter of 80 mm and height of 70 mm was performed. The anode was made in the form of 16 plates evenly installed around the circumference near the open part of the chamber communicating with the atmosphere, and the cathode was made in the form of copper rods installed on the side of the closed end of the chamber, the discharge gap between the cathode and the anode was about 35 mm. The anode and cathode were connected to the capacitor bank with capacity of 9600 UF, charged to a voltage of 3 kV. The initiation of a pulsed gas discharge was carried out by means of plasma formed during an electric explosion of copper wires installed near the cathode. During the experiment, oscillograms were obtained that allowed us to estimate the parameters of the pulsed gas discharge: it occurred 20 microseconds after the electric explosion of the wires, the duration of the leading front of the pulse was 30 microseconds, the duration of the trailing front of the pulse was 70 microseconds, the current amplitude was about 600 kA. According to the video recordings, we found that after the pulsed gas discharge, there were autonomous plasma formations above the discharge chamber, whose lifetime ranged from 20 ms to 100 ms. This work was supported by Ministry of Science and Higher Education of Russia (state contract No. 14.518.11.7002).