

Two wavelength interferometry of current channel in long spark

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The current channel of an long spark forms by leader processes. Leader channels are characterized by high temperature and conductivity. To determine the temperature and the ionization degree of plasma in the current channel using laser probing techniques, it must be carried out at two wavelengths.

In this work we present the results of two-wavelength laser probing of the long spark discharge. Laser diagnostics included interferometry and shadow photography. The studies were carried out on the ERG setup with a discharge gap ~ 40 cm. Voltage pulses with an amplitude of up to 1.2 MV and a maximum current of up to 10 kA were applied to the discharge gap. It was found that, before the breakdown stage, an internal channel is formed inside the leader channel, which is approximately twice as small in diameter and has a higher degree of plasma ionization than a primary channel.

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