Possible scenarios of secondary discharge development upon electric explosion of wire in air and in vacuum.

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It can be stated that when electrically exploding wires in air and in vacuum a development of the secondary breakdown of the interelectrode gap is possible in two scenarios, depending to a large extent on the thermophysical properties of the exploding wires. In the first case, the breakdown occurs in the air at the boundary of dense explosion products, e.g., air mixed with metal (for example, tungsten) vapor. The shunting of current hinders further heating of the wire explosion products. In the second scenario, development of breakdown occurs in the wire material vapor rather than in surrounding medium. An example of the development of such a process can be observed when low-melting-point copper wire is exploded. The energy continues to be deposited in the wire explosion products, which supports their further explosive expansion.

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