Numerical model of the source of shock wave excitation in a high-pressure gas-discharge chamber under the influence of a high-current discharge

Triaskin J.V.[1,@], **Pinchuk M.E.**[1], **Tryaskin N.V.**[1], **Bogomaz A.A.**[1] **and Budin A.V.**[1]

[1] Institute for Electrophysics and Electrical Power of the Russian Academy of Sciences, Dvortsovaya Naberezhnaya 18, Saint-Petersburg, 191186, None

[@] ubik33@yandex.ru

A model of the source of shock wave excitation in a gas-discharge cylindrical chamber filled with hydrogen at a high pressure of $0.5 \div 32$ MPa is presented. The source of perturbation is interelectrode breakdown by a megaampere-class current with a rise rate 10^{10} A/s [1]. It is defined that the discharge produces a plasma channel with separated boundary of envirements [2]. In such a representation, the plasma channel can be described by a wire-conductor with time-dependent conductivity. This allows us to estimate the electric field strength in the discharge and to refine the model of energy release in the discharge channel [3]. The calculation of the electric field and conductivity in the plasma channel allows us to improve the accuracy of the description of the energy release source for the problem of shock wave propagation in a cylindrical discharge chamber when discharging with megaampere-class currents.

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