

ESTIMATION OF MODEL APPLICABILITY LINEAR CURRENT IN A GAS ENVIRONMENT

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Model of the linear current [1] is used in studies of spatial - temporal structure of emitters, moving at the speed of light.

The GEANT-package assisted method of an electrodynamic problem's foreign source calculation, together with the cumulative field of individual electrons production technology [2] have been used in this work.

The current pulse used in the model of a linear current is formed via the irradiation of the environment by a collimated bunch of hard radiation, and the vector of current density is defined using coordinates and velocities of the electrons, produced in the environment.

The approximation of the shape of the pulses generated in the process of the interaction of hard radiation with a substance (of environment) obtained in [3], has also been used in this work.

The comparison of amplitudes and durations of the B_ϕ - components of the produced (by the primary irradiation) electromagnetic fields that have been calculated using the current pulse moving along the line's model, on one hand and those, obtained by summing the fields generated by individual electrons - on the other, showed a qualitative similarity of results at small angles .

1. V.V.Borisov. The electromagnetic field of the transient currents. St-Petersbug: St-Petersburg State University Press, 1996.
2. F.F.Valiev // Proceedings of the International Conference Days on Diffraction. 2013. DD 2013. P.151.
3. F.F.Valiev. // Bulletin of the Russian Academy of Sciences: Physics. 2013. V.77. № 7. P.971.