*ФИЗИКА ПЛАЗМЫ И ЭЛЕКТРОФИЗИКА*

# LATTICE BOLTZMANN SIMULATION OF ELECTRIC FIELD IN CO-LINEAR PULSED ELECTRIC FIELD (PEF) TREATMENT CHAMBER

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*The treatment efficacy of PEF processing is directly subject to its electric field distribution in the treatment zone. A reliable and efficient model to predict the distribution plays a crucial role for clarifying the treatment mechanism and for improving the treatment effect. A lattice Boltzmann model (LBM) to describe the electric field distribution in a co-linear PEF processing was developed. Based on the assumption that PEF does not cause a time varying magnetic field, the simulation was carried out by using the charge conservation equation. For a two-dimensional LBM, we specified the macroscopic boundary condition for electric potential at high voltage and ground electrodes, and bounce-back boundary condition for electric potential at the insulator. Our model was validated by comparing with previous results based on the finite element method (FEM) for the existing co-linear treatment chambers. We suggested another type of treatment chamber with "holo-elliptical" geometry by which the uniformity of electric field was remarkably improved.*

**Keywords**: pulsed electric field, electric field distribution, treatment chamber, lattice Boltzmann method.

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