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SIMULATION OF INTERACTIONS BETWEEN RARIFIED PLASMA FLOW AND FAIRED CHARGED CONDUCTING CYLINDER NEAR CONDUCTING SURFACE

The technique of the 2D numerical simulation of interactions between a rarified plasma and the charged body near the conducting surface is proposed. The technique is based on the solution of the Vlasov–Poisson equations by the method of finite differences with splitting on physical processes on the nested spatial grids. In the iterative process the Poisson–Boltzmann approach with a simulated distribution of the electron concentration in the central field is used for computation of the self-consistent electrical field. Efficiency of the technique for a monotonous electrical field near the charged body is proved. It is shown that the value of the floating potential and the slope of the electronic branch of the voltage-current characteristic of a cylindrical probe is considerably varied near the conducting surface. Practical application of this technique improves the informativity of probe measurements.

Keywords: two-dimensional simulation, rarified plasma, conducting surface, Vlasov- Pouasson model, Pouasson- Boltzmann approximation.

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