

Numerical and experimental study of a warming up effect of an underexpanded rarefied rf plasma jet outflowing into a flooded area

Shemakhin A., Zheltukhin V., Khubatkhuzin A.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

© Published under licence by IOP Publishing Ltd. A mathematical model of the rf plasma flow at 13.3-133 Pa in transition regime at Knudsen number values $8 \times 10^{-3} \leq Kn \leq 7 \times 10^{-2}$ and the nozzle pressure ratio $n = 10$ for the carrier gas is described. The model based on both the statistical approach to the neutral component of the rf plasma and the approach to the continuum model for electron and ion components. The results of plasma flow calculations performed both for an undisturbed flow and for the stream with a sample at a prescribed electric field are described. The effect of a warming up of a stream in a mixture zone confirmed by comparison of numerical results with experimental ones is found.

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