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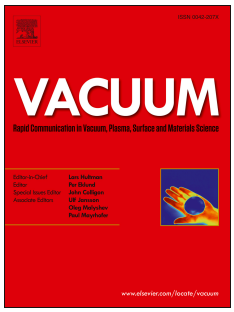

Computer simulation of the sheath and the adjacent plasma in the presence of a plasma source

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Computer simulation of the sheath and the adjacent plasma in the presence of a plasma source

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Abstract

A model is constructed allowing computer simulations of the near-wall area of a planar plasma sheet in conditions where the steady state of the plasma is supported by the production of charged particles in a region removed from the wall. Calculations have revealed variation in the energy distribution of the electrons in both time and spatially over the sheet width (cooling the electronic component) due to absorption of fast electrons at the walls bounding the plasma volume. It is shown that the plasma density profile across the sheet width has an abrupt decrease at the boundary of the region of plasma regulation. Thus the standard concepts of the potential and plasma density distributions in the sheath and presheath based on the assumption of a stable energy distribution for the electrons in the presheath yields inaccurate results for the plasma sheet where the ionization source is remote from the wall.

Keywords: Low temperature plasma; computer simulation; plasma sheath; energy distribution

1. Introduction

In our paper [1] results and analysis are presented of the effect of charging of a dielectric surface due to the impact of plasma particles on a structure consisting of a microwire on an insulating substrate which is set to a fixed potential which extracts