

EFFECTIVE SEPARATOR FOR EXTRACTION OF HEAVY DROPS FROM PLASMA FLOW

V.I.Maslov, I.I.Aksenov, S.V.Barchuk, A.M.Egorov, Yu.V.Melentsov*, I.N.Onishchenko,
D.A.Sytnykov*

NSC Kharkov Institute of Physics and Technology, Kharkov 61108, Ukraine

**Karazin Kharkov National University, Kharkov, 61108, Ukraine*

E-mail: vmaslov@kipt.kharkov.ua

The separation of heavy drops from plasma flow for the film coating is very important. The optimized parameters of such separator is researched in this paper. This separator has cylindrically symmetrical cusp kind of the magnetic field geometry. Plasma flows propagate along separator axis towards each other. Plasma electrons are magnetized. According to condition of plasma charge neutralization the light particles of plasma flows propagate along magnetic field lines to cylindrical wall. Due to particle collisions, small magnetic field or oscillation excitation the electron dynamics is not controlled effectively by magnetic field. It is shown in this paper that for any plasma flow density there is optimal value of the magnetic field for the best separation. For the smaller and larger magnetic field value the separation is essentially worse. For the small magnetic field the electrons are not magnetized. In this case radial velocity of electrons is large due to collisions. For the larger magnetic field the oscillated fields are excited and lead to anomalous transversal electron transport. The expressions for the optimal magnetic field value and optimal plasma flow density are derived. For optimal parameters the plasma electrons are magnetized, but oscillated fields are not excited. The mechanisms of suppression of oscillated field excitation are also considered.