

INFLUENCE OF METASTABLE ARGON ATOMS  
AND DUST PARTICLES ON GAS  
DISCHARGE PLASMA

*A.V. Fedoseev<sup>1</sup>, G.I. Sukhinin<sup>1,2</sup>*

<sup>1</sup>S. Kutateladze Institute of Thermophysics,  
Siberian Branch of Russian Academy of Science  
(1, Lavrentyeva Ave., Novosibirsk 630090, Russia;  
e-mail: fedoseev@itp.nsc.ru),

<sup>2</sup>Novosibirsk State University  
(2, Pirogova Str., Novosibirsk 630090, Russia)

S u m m a r y

The model of a DC glow discharge with metastable argon atoms and dust particles based on the Boltzmann equation for the electron energy distribution function (EEDF), dust particle charging, and balance equation for metastable argon atoms is presented. The processes of direct and stepwise electron impact ionization, metastable-metastable collisions, and recombination of electrons and ions on the dust particle surface and discharge tube wall are taken into account. The results show that the densities of metastable argon atoms and dust particles are in strong correlation, and both sufficiently influence gas discharge parameters.