

Abstract Submitted  
for the GEC15 Meeting of  
The American Physical Society

**Positive column of the glow discharge in argon** VALERIY LISOVSKIY<sup>1</sup>, EKATERINA ARTUSHENKO, VLADIMIR YEGORENKOV, Kharkov National University, 61022, Kharkov, Svobody Sq. 4, Ukraine — We report the measurements we performed of the reduced electric field strength  $E/p$  in the positive column in the range of the gas pressure and tube radius product of  $0.01 < pR < 30$  Torr·cm. We got good agreements with numerical models and experimental data of other authors. We also present two analytical models for the reduced electric field  $E/p$ . The first model deals with the ambipolar mode of the positive column of the constant current discharge in noble gases. We consider the case of a balance between the rate of charged particle production due to direct ionization of gas molecules through electron impact and their escape to the discharge tube walls. Simple expressions for the reduced electric field  $E/p$  in the positive column in argon are obtained. The second model consists in considering the production and loss of charged particles and metastable atoms and obtaining a simple equation for the reduced electric field  $E/p$  depending on the discharge current density, gas pressure and tube radius. These models furnish a good description of experimental data in the whole range of  $pR$  values studied.

<sup>1</sup>and Scientific Center of Physical Technologies, Svobody Sq.6, Kharkov, 61022, Ukraine

Valeriy Lisovskiy  
Kharkov National University, 61022, Kharkov, Svobody Sq. 4, Ukraine

Date submitted: 14 Jun 2015

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