Abstract Submitted
for the GEC10 Meeting of
The American Physical Society

Low pressure gas breakdown in longitudinal combined electric fields VALERIY LISOVSKIY, Kharkov National University, 4 Svobody sq., Kharkov, 61077, Ukraine, NADIIA KHARCHENKO, VLADIMIR YEGORENKOV — This paper contains the complete experimental and analytical picture of gas breakdown in combined electric fields for arbitrary values of rf and dc fields. To obtain it, we continued the study of the discharge ignition modes in nitrogen with simultaneous application of dc and rf electric fields presented in Lisovskiy V. *et al.* 2008 J. Phys. D: Appl. Phys. 41 125207. To this end, we studied the effect of rf voltage on dc discharge ignition. When we applied the rf voltage exceeding one corresponding to the minimum breakdown voltage of a self-sustained rf discharge, then the curve of the dependence of a dc breakdown voltage of a combined discharge on gas pressure was found to consist of two sections. We got the generalized gas breakdown criterion in combined field valid for arbitrary values of rf and dc electric fields. The calculation results agree with experimental data satisfactorily.

Valeriy Lisovskiy
Kharkov National University, 4 Svobody sq., Kharkov, 61077, Ukraine

Date submitted: 03 Jun 2010 Electronic form version 1.4