## Abstract Submitted for the GEC07 Meeting of The American Physical Society

Study of the transition between MicroHollow Cathode Discharge and MicroCathode Sustained Discharge in a 3-electrode system L.C. PITCHFORD, K. MAKASHEVA, TH. CALLEGARI, J.P. BOEUF, LAPLACE, CNRS-Universite de Toulouse, 31062 Toulouse, France, J. SANTOS SOUSA, V. PUECH, LPGP, CNRS-Universite Paris-Sud, 91405 Orsay, France, LAPLACE TEAM, LPGP TEAM — MicroHollow Cathode Discharges (MHCDs) are known to be good sources for production of DC non-thermal plasmas at high gas pressure. Using them as a cathode in a system with third positivly biased electrode, placed at distance of about 1 cm from the MHCD, allows the ignition of a stable, larger volume plasma in the MicroCathode Sustained Discharge (MCSD). The aim of our study is to investigate the electrical properties of the discharge when it is sustained in different gases (He, Ne, Ar or  $O_2$ ). The voltage-current (V-I) characteristics of the MCSD were measured for gas pressures in the range p = 50 - 200 Torr, varying gas flow Q = 50 -500 sccm and gas composition. The MHCD is a sandwich type, consisting of 100  $\mu$ m thick molybdenum electrodes glued on each side of 500  $\mu$ m thick Al<sub>2</sub>O<sub>3</sub> plate, with a 800  $\mu$ m diameter hole. The transition between the MHCD and MCSD, defined as the point where the third electrode collects all the electron current, is rather abrupt and depends on the operating conditions. Results from model calculations will also be presented to help clarify the phenomena occuring during the transition.

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