Abstract Submitted
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Time resolved laser absorption spectroscopy in a self-pulsed microplasma.[1] X. AUBERT, A. ROUSSEAU, LPTP, Ecole Polytechnique, CNRS, Palaiseau, France, J.F. LAGRANGE, N. SADEGHI, LSP, UJF, CNRS, Grenoble, France — It was recently shown that microplasmas of the microhollow cathode type geometry may operate in a self-pulsing regime for intermediate current (0.1-1 mA) [1]. At lower current (< 0.1 mA) the plasma is stable and located inside the hole; at higher current (> 1 mA) , the plasma is also stable but expands outside the hole on the cathode backside region. The self pulsing was attributed to the breakdown of the gas, outside the micro-hole, on the cathode backside. However, the mechanisms of the plasma ignition on the cathode backside are not understood and metastable atoms may play a major role. In the present work, time resolved diode laser absorption measurements have been performed through the micro-hole in the self-pulsing regime; the plasma hole ranges is in the range of 100 μm and the gas pressure ranges from 50 to 300 Torr; the feed gas is argon and the transition studied is 772.376 nm (Paschen notation 1s5-2p7). The objective is i) to measure the time evolution of the 1s5 metastable density, ii) deduce the gas temperature and plasma density from the absorption line profile. Similar results are performed in 3 electrodes configuration
[1] A. Rousseau and X. Aubert J. Phys.D : Appl. Phys. **39** (2006) 1619–1622.

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