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Study of a microwave micro-plasma reactor at atmospheric pressure J. GREGÓRIO, LPGP UPS Orsay / IPFN IST Lisboa, P. LEPRINCE, O. LEROY, LPGP UPS Orsay, L.L. ALVES, IPFN IST Lisboa, C. BOISSE-LAPORTE, LPGP UPS Orsay — In this paper we study a 2.45 GHz microwave micro-plasma source, working in air and in argon at atmospheric pressure. The discharge is sustained within a slit (50 μm -200 μm wide and 6mm width), delimited by two metallic blades placed at the end of a microstrip line [1]. The reactor has two impedance matching units that allow tuning the resonance frequency and the quality factor of the circuit. Optical emission spectroscopy diagnostics allow to deduce the plasma rotational temperature (T_{rot}). In air discharges, the N_2 transition $C^3\Pi_u$-$B^3\Pi_u$ yielded T_{rot} between 900 and 1400 K, for 30-45 W input powers and 50-100 μm slits. In argon discharges, the OH transition $A^2\Sigma^+$-$X^2\Pi$ was used, and T_{rot} was found between 500 and 600K, for 8-15W input powers and 50-150 μm slits. For these discharges, the argon electron excitation temperature was found between 0.3 and 0.6 eV. Measurements of the H_β Stark broadening suggest an electron density of the order of 10^{14} cm^{-3}.
[1] J. Gregorio, L.L. Alves, P. Leprince, O. Leroy and C.Boisse-Laporte, 2008 19^{th} ESCAMPIG, Granada, Spain

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