

Abstract Submitted
for the GEC07 Meeting of
The American Physical Society

H $_{\alpha}$ and H $_{\beta}$ Line Broadening in Microplasma Jet at Atmospheric Pressure¹ JAYR AMORIM², JORGE SOUZA CORRÊA, CARLOS OLIVEIRA, BOGOS SISMANOGLU, MARCELO GOMES, Departamento de Física, Instituto Tecnológico de Aeronáutica, Comando-Geral de Tecnologia Aeroespacial, 12228-900, Sao José dos Campos-Brazil — Microplasma jets of argon/hydrogen mixture were generated by radio-frequency waves at 144 MHz with powers ranging from 5W to 50W. Microjets with length of 15.0 mm were created at atmospheric pressure. Electrons and ions present in the plasma may induce broadening of Balmer lines due to Stark effect. This effect is the most important one in the H $_{\beta}$ line broadening, although contribution from Resonance and Doppler effects should be taken into account. Through the analysis of H $_{\beta}$ line the electron density was measured as a function of power and position in the jet. Broadening of H $_{\alpha}$ line may be mainly due to Doppler, Resonance and Stark effects. Through a careful analysis the influence of each one was evaluated, as a function of electron density and gas temperature in order to estimate the atomic temperature. Analyzing the fine structure splitting of H $_{\alpha}$ line, the H atom temperature at nozzle jet exit was around 23000 K in the Ar/H $_2$ micro plasma at atmospheric pressure.

¹work partially supported by CAPES,CNPq and FAPESP

²Membership Pending

Jayr Amorim
Department of Physics-Instituto Tecnológico de Aeronáutica

Date submitted: 18 Jun 2007

Electronic form version 1.4