Abstract Submitted
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Distribution and Dynamics of Argon Metastables in Supersonic Flowing Microwave Discharges and Post-Discharges MILKA NIKOLIC, ANA SAMOLOV, CHARLES I. SUKENIK, SVETOZAR POPOVIC, LEPOSAVA VUSKOVIC, Center for Accelerator Science, Old Dominion University — Supersonic flowing microwave discharge in Argon exhibits a peculiar asymmetric post-discharge glow, which is detached from the discharge. We have studied the behavior of 4p Ar states using optical emission tomography and found their strong transversal motion possibly originating from rotational component of the flow [1]. In this work, we have employed Laser Induced Fluorescence (LIF) technique to obtain the excited state populations from the argon spectra in the post-discharge of the supersonic flowing microwave discharge. The experimental set-up consists of a pulsed tunable dye laser operating in the near infrared region and a cylindrical resonance cavity operating in TE111 mode at 2.45 GHz. The microwave discharge was obtained at the pressure of 2.4 Torr and the gas temperature in the post-discharge was gradually decreasing from ∼1100 to ∼ 800 K. We present the population distributions of 4p states and compare the results between the LIF and OES methods, and the population distributions of the 4s metastable states from LIF measurements.

[1] M. Nikolic, F. Cuckov, A. Samolov, A. Godunov, S. Popovic, and L. Vuskovic, "Tomography as a Diagnostic Tool for Plasma Etching of SRF Cavities," Proc. IPAC, WEPPC104 (2012) (New Orleans, LA).

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