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Tomographic Reconstruction of Local Parameters of a Plasmoid in the Afterglow of a Supersonic Flow Microwave Discharge ANA SAMOLOV, MILKA NIKOLIC, ALEXANDER GODUNOV, SVETOZAR POPOVIC, LEPOSAVA VUSKOVIC, Old Dominion University, Department of Physics, Center for Accelerator Science, Norfolk, VA 23529, FILIP CUCKOV, Old Dominion University, Department of Electrical and Computer Engineering, Norfolk, VA 23529 — The tomographic reconstruction of local plasma parameters has been used for characterization of a plasmoid in the afterglow region of an Ar supersonic microwave discharge. A cylindrical cavity was used to sustain a discharge in the pressure range of 100-600 Pa. The developed tomographic numerical method is based on the 2D Radon formula for a cylindrical cavity. The optical emission spectroscopy measurements are taken at different positions and under different directions to observe populations of excited and ionic species in the plasmoid region. An Automated Measurement System (AMS) has been built with the aim to increase the overall precision of the taken measurements as well as to streamline the measurement process. The AMS consists of the mirror and a microcontroller-based system, composed of two high-precision stepper motors and several sensors providing precise feedback control. The AMS has controlled the angle and distance of measuring system from the cylindrical cavity, within sub-degree angle precision and sub-millimeter distance precision.

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