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Experimental investigation of optical discharges with an ablative wall in channels E. YU. LOKTIONOV, YU. YU. PROTASOV, Bauman Moscow State Technical University, STATE LAB FOR PHOTON ENERGETICS TEAM — Active medium flow in laser plasma thrusters is supposed to be radially confined, but most of plasma plume dynamics research is conducted using free surface targets. Some papers present results of integral momentum experimental evaluation for condensed matter ablating targets mounted in nozzles, but dynamics and plume morphology features of confined flows are not described. We present the results of shadowgraphic, schlieren and interferometric observation of polymers ((C₂F₄)_n, (CH₂O)_n) laser ablation ($\lambda \sim 532, 1064$ nm, $\tau_{0.5} \sim 12$ ns) radially confined (10x10 mm) plumes dynamics and macrostructure experimental investigation both at ambient and vacuum conditions. Results are compared to free surface case for the same targets and experimental conditions in terms of shockwave velocity, pressure and temperature, target material vapors velocity and density.

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