

Abstract Submitted
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Plasma diagnostics of non-equilibrium atmospheric plasma jets

ALEXEY SHASHURIN, DAVID SCOTT, MICHAEL KEIDAR, The George Washington University, MIKHAIL SHNEIDER, Princeton University — Intensive development and biomedical application of non-equilibrium atmospheric plasma jet (NEAPJ) facilitates rapid growth of the plasma medicine field. The NEAPJ facility utilized at the George Washington University (GWU) demonstrated efficacy for treatment of various cancer types (lung, bladder, breast, head, neck, brain and skin). In this work we review recent advances of the research conducted at GWU concerned with the development of NEAPJ diagnostics including Rayleigh Microwave Scattering setup, method of streamer scattering on DC potential, Rogowski coils, ICCD camera and optical emission spectroscopy. These tools allow conducting temporally-resolved measurements of plasma density, electrical potential, charge and size of the streamer head, electrical currents flowing through the jet, ionization front propagation speed etc. Transient dynamics of plasma and discharge parameters will be considered and physical processes involved in the discharge will be analyzed including streamer breakdown, electrical coupling of the streamer tip with discharge electrodes, factors determining NEAPJ length, cross-sectional shape and propagation path etc.

Alexey Shashurin
The George Washington University

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