

SOURCES OF NONEQUILIBRIUM PLASMA AT ATMOSPHERIC PRESSURE

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S u m m a r y

The electrical arc discharge in a transverse blowing gas flow [transverse arc – (TA)] and the discharge in the gas flows immersed into the liquid [discharge in the gas channel with a liquid wall – (DGCLW)] are studied as the sources of nonequilibrium plasma at the atmospheric pressure. Diagnostics of both discharges is made by optical emission spectroscopy. The population distribution temperatures of excited electronic and vibrational states (electronic T_e^* and vibrational T_v^* temperatures, respectively) are determined from Boltzmann plots. Rotational temperatures T_r^* are determined by comparison of some nitrogen and hydroxyl experimental spectral bands with results of their computer simulations. Measurements are carried out for different currents I_d and gas flow rates G . Plasma parameters of TA and DGCLW were compared with other known sources of nonequilibrium plasma such as a gliding arc (GA) and the gliding arc in a tornado (GAT). It is concluded that TA and DGCLW could generate a high-pressure non-thermal plasma stationary in time. At the same time, the level of non-equilibrium of the TA plasma is higher than that in DGCLW.