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Measurement Of Plasma Parameters In Micro-Discharge By Wall Probe[1] ALMAZ SAIFUTDINOV, ANATOLY KUDRYAVTSEV, SERGEY SYSOEV, Saint-Petersburg State University — The increasing scientific and practical interest for glow discharge at high pressure is largely determined by the fact that their use does not require expensive and huge vacuum equipment. The analysis shows that, in contrast to the well-studied positive column (PC), the basic parameters of the plasma negative glow (NG) and Faraday dark space (FDS) of micro-discharges are studied insufficiently. The difficulties of the experimental diagnostics are associated with the fact that for the fixed values of pL with the increasing gas pressure the length of the micro-discharge decreases. And a small size is extremely difficult to diagnose spatial parameters distribution of micro discharges. Since at a small size introducing traditional Langmuir probe into the plasma capacity is not possible technically, it was proposed to use an additional measuring electrode (wall probe) disposed between the cathode and the anode for measurement of the fast EEDF. With its use we have registered EEDF fast electrons produced in the reaction of Penning ionization out of earlier reach range of high-pressure gas (from 20 to 200 Torr). In this paper by using wall probe we measured the basic parameters of NG plasma in micro-discharge in helium in a wide range of pressures. It is shown that the electrons temperature in the NG plasma is low and amounts to few fraction of 1 eV, which differs from the electron temperature in PC plasma. This allows the use of NG plasma for analysis by gas plasma electron spectroscopy.

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