**MEASURING THE DISTRIBUTION OF THE BRAKING PRESSURE OF THE PLASMA FLOW ON THE SURFACE OF THE TARGET IN THE IMITATION EXPERIMENTS OF THE TRANSIENT PLASMA PROCESSES IN ITER AT THE KSPU-T INSTALLATION**

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This research presents the results of measuring the distribution of the braking pressure of the plasma flow over the surface of the irradiated solid target, generated by the quasi-stationary plasma accelerator KSPU-T [1]. A 5 mm thick square metal plate was used as a target. A pressure sensor with a PZT-19 piezoceramics sensor was used to measure the braking pressure. The diameter of the receiving surface of the sensor was 5 mm. During the experiments, the receiving end of the sensor was inserted into the hole in the plate, so that its surface was flush with the front surface of the plate. The sensor with the plate was installed in the plasma accelerator chamber in such a way that the front surface of the plate was oriented perpendicular to the plasma flow, and its center was on the flow axis.

The characteristic duration of exposure τ and the maximum heat load Qmax, when the target was irradiated with a plasma flow, corresponded to those expected in ITER during transient plasma processes, such as ELM events and discharge breakdowns [2]: the τ value varied in the range of 0.3–1.0 ms, and the value of Qmax was in the range of 0.3–2.5 MJ/m2. The braking pressure distributions over the target surface are obtained for various transverse dimensions of the used metal plates, as well as when the target is installed at a different distance from the output end of the accelerator electrodes. Also a comparison of the distribution of the braking pressure of the plasma flow with the distribution of the heat load over the target surface under the same irradiation conditions was made.

References

1. Zhitlukhin A., Klimov N., Landman I. et al., J. Nucl. Mater. 2007. p. 363–365
2. Loarte A., Saibene G., Sartori R. et al. Transient heat loads in current fusion experiments, extrapolation to ITER and consequences for its operation. Physica Scripta, 2007, vol. 128, p. 222–228