Features of jet plasma flows IN EXTERIOR MAGNETIC FIELD

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The experimental research of action of an exterior (quasi azimuthal) magnetic field on stability of an electroelectric arc between rod graphite electrodes in open aerial atmosphere is spent. Experiments are spent by the help of the magnetic system created on the basis of system of the linear currents, formativing exterior in relation to the discharge a magnetic field which is pressing out the discharge channel of an arc [1–3]. Unlike operation [4] variants as vertically, and horizontally oriented discharge column are viewed.

In addition to experiments with the discharge in the quasi azimuthal magnetic field in comparison of efficiency of stabilisation of an arc and examinations were conducted in the axial field created by currents in coils of the solenoid.

The data obtained in operation is grounded on visualisation of discharge processes both synchronous diagnostics and the analysis of oscillograms of a current and a voltage on a discharge gap. The velocity panoramic video shooting was spent. Video shooting parametres: velocity is 1200 k/s, exposure time is 25 µs. The interelectrode distance varied within 5–100 mm. The gamuts of discharge currents (I) and currents of magnetic system (Im) were up to 600 A. The number of the linear currents in magnetic system varied in limits: N = 1–6.

As a result of the spent examinations the data about possibilities of stabilisation of an extended electric arc, as in azimuthal, and an axial exterior magnetic field is obtained. Features of behaviour of the discharges, accompanying various modes of stabilisation are discussed.

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References

1. V.O. German, A.P. Glinov, A.P. Golovin, P.V. Kozlov // Prikl. Fiz., No. 4, 35-39 (2014).
2. V.O. German, A.P. Glinov, A.P. Golovin, P.V. Kozlov // Uspekhi Prikl. Fiz., Vol. 2, No. 5, 498 - 504 (2014).
3. V.O. German, A.P. Glinov, A.P. Golovin, P.V. Kozlov // Prikl. Fiz., No. 5, 33-38 (2015).
4. V.O. German, A.P. Glinov, A.P. Golovin, P.V. Kozlov, K.V. Shaleev // XLIII International (Zvenigorodsky) conference on a plasma physics and CNS, February 8-12, P. 288(2016).