OVERHEATING INSTABILITY FOR AN HF ARC DISCHARGE IN AIR AT ELEVATED PRESSURES

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During theoretical and experimental research of a high-frequency arc discharge [1] in air at pressures above atmospheric, instability was found, which manifests itself in the appearance of jumps in the current and plasma temperature. Loop-shaped sections appear on the current-voltage characteristics of the arc.

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This type of instability was confirmed in an experimental study of an HF arc discharge. In this case, the current jumps were accompanied by a sharp increase in the plasma temperature and radiation from the discharge region. The active power of the discharge increased, but the reactive power of the discharge increased especially strongly, which was explained by an increase in the discharge inductance caused by a decrease in the radius of the conductive zone.

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Conflict of interest

The authors declare that they have no conflicts of interest.

References

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