

**Modes of current transfer to cathodes arc discharge of high pressure and stability**

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**Scientific Responsible:**

**Prof. Doutor Mikhail Benilov (benilov@uma.pt)**

**Characterization:**

This project aims at basic research in order to extend the theory of modes of plasma-cathode interaction in a non-stationary and its experimental validation. This is a multidisciplinary task that requires the use of methods of physics and chemistry of plasmas, theory of heat conduction, hydrodynamics, kinetic theory, bifurcation theory, as well as advanced methods of numerical modeling methods and experimental plasma physics.

**Objectives:**

- To investigate the stability of multiple stationary solutions, describing the diffuse and spot modes of transfer of current, the problem with nonlinear boundary conditions governing the distribution of temperature picked;
- Find and investigate non-stationary solutions describing the transitions between different regimes for the transfer of AC;
- Identify the conditions under which the current transfer occurs in non-stationary mode or diffuse staining;
- Develop a unified description of the region near the plasma and a model of the plasma region near the anode;
- Investigate the coupling between the cathodic part of the discharge and plasma volume.