## Main field of study: 011200 Physics

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# **Simulation of low temperature atmospheric pressure plasma sources**

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Recently, an atmospheric pressure discharges in air were the subject of numerous studies. It is caused a broad spectrum of their possible technological applications. Much attention is attracted by a cold atmospheric plasma (CAP) as an effective tool for the treatment of biological materials.

The main objective of this work was to construct a numerical model of corona discharge in helium at atmospheric pressure. Main parameters of the discharge (the concentration of charged and excited particles, the electron temperature) and their dependence on the input parameters of the model (geometry, electrode voltage, power) were calculated.

The calculation was based on the two-dimensional hybrid model. Two different plasma-chemical models were considered. Models were built for RF corona and negative DC corona discharge. The system of equations is solved by the finite element method in the [COMSOL Multiphysics](http://www.comsol.com/)..

The calculations showed that the shape of the electron distribution near the electrode depends on the discharge power. The neutral gas heating data obtained will allow predicting the temperature of the gases at the designing of plasma sources.

# The list of the publications:

1. Бекасов В.С., Елисеев С.И., Кирсанов Г.В., Кудрявцев А.А., Степанова О.М. «ПРОСТРАНСТВЕННОЕ РАСПРЕДЕЛЕНИЕ ПАРАМЕТРОВ МИКРОРАЗРЯДА В ВОЗДУХЕ» XLII Международная Звенигородская конференция по физике плазмы, 2015
2. В.С. Бекасов, Г.В. Кирсанов, А.А.Кудрявцев, С.И. Елисеев, О.М.Степанова «РАСЧЕТ КОМПОНЕНТНОГО СОСТАВА ХОЛОДНОЙ ПЛАЗМЫ МИКРОРАЗРЯДА В ВОЗДУХЕ» XLII Международная Звенигородская конференция по физике плазмы, 2015