Analysis of a radiofrequency-driven resonant plasma source

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This work presents a design of our low-pressure plasma source, based on a high-frequency resonant network, and its characterisation using Optical Emission Spectroscopy and measurement of its electrical parameters (particularly extracted electron and/or ion current and the ratio of the reflected power). The characterisation is done for a wide range of input parameters (e.g., external magnetic field, operating pressure of working gas (Argon) and radiofrequency input power). The ion current brings an overview of the source behaviour at different conditions, while the OES shows the distribution of selected excited species (with special regard to the Argon metastables). These two methods are compared and linked together leading to the matrix of results for each set of the input parameters. Selected one or two-dimensional (charts, resp. maps) cuts of the results are presented and discussed against model and theory, to understand the behaviour of the plasma source.

Acknowledgement: This work was supported by the SILAS project awarded by the Technology Agency of the Czech Republic (grant no. FW06010622). The preparation of this paper was assisted by the general student development project in progress at Brno University of Technology.