Karlsruher Institut für Technologie

Bachelor/Master Thesis

Developing advanced interface for automation of spectra-fitting method based on MassiveOES

Motivation

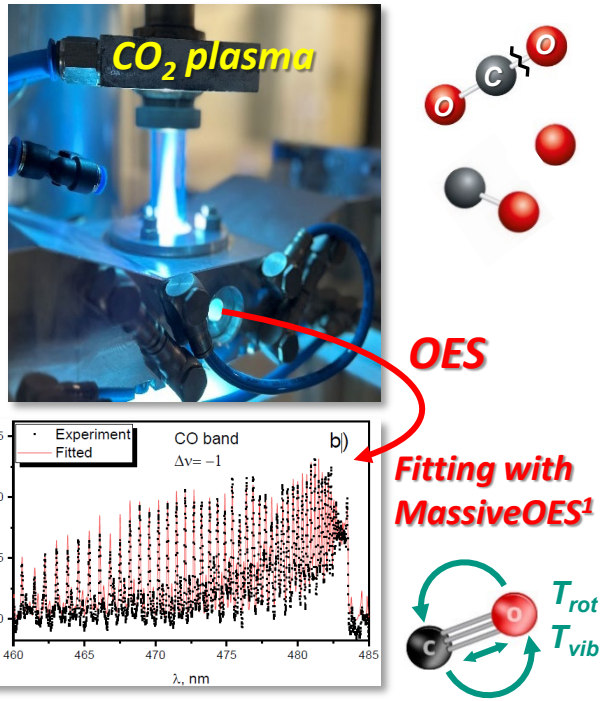
In the framework of the Helmholtz Program *Materials and Technologies for the Energy Transition* in the topic *Chemical Energy Carriers* we investigate microwave sustained plasmas for the synthesis of fuels and commodities. As one of most urgent, the plasma-assisted conversion of carbon dioxide (CO_2) into syngas (CO + H_2) is studied in our group. For characterization of the plasma species, the plasma light is acquired using optical emission spectroscopy (OES). The emission spectra are then fitted with the open-source software MassiveOES, that enables the estimation of vibrational and rotational temperatures of molecules in the plasma.

Task description

To automate the process of temperature estimation from experimental data, it is necessary to develop the program interface enabling the acquisition OES spectra, spectrum fitting with MassiveOES and the storage of obtained temperatures. Since MassiveOES is written in Python, good knowledge and experience in Python is essential. For master thesis, it is foreseen additionally the investigation of CO_2 plasma temperatures in different plasma scenarios.

Requirements

Essential experience in Python programming
Experience in GUI developing as a plus



[1] https://bitbucket.org/OES_muni/massiveoes/src/master/

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