Fraunhofer MEOS

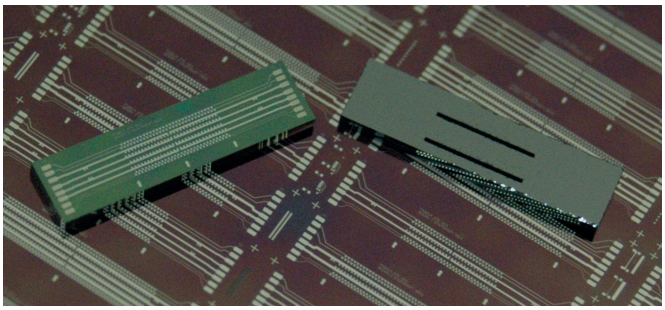
Breath analysis with Ion Mobility Spectrometry

Ion mobility spectrometer with mouthpiece for breath analysis

One approach for the non-invasive diagnostics of many diseases is the analysis of gaseous biomarkers, i.e., disease-specific, volatile organic compounds (VOCs). A change of the metabolism of diseased, infected or altered body cells might lead to a concentration change of the VOC profile or even the production of disease-specific VOCs.

The goal of this project is to develop a novel system for detecting gaseous biomarker VOCs for biomedical diagnostics. The core of the targeted system is a miniaturized ion mobility spectrometer (IMS). This will allow a simple and fast detection of relevant VOCs. Within only a couple of minutes, concrete indications of the disease could be retrieved on-site and without pain through a non-invasively collected sample (breath, urine, stool, sweat). The demonstrator developed in this project provides a basis for a future device development together with interested industrial partners. In detail, the following tasks are being addressed:

- Identification of specific requirements of selected applications
- Enhancement of the miniaturized IMS concept provided by Fraunhofer IPMS
- System development and setup of a laboratory demonstrator, including the necessary gas pre-treatment and sampling
- Proof-of-concept addressing a selected application scenario
- Development of a data analysis software



Ion filter - the core of the analysis system

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