

Seminar

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Photonic Biosensors in a CMOS-Technology

Silicon-based optical biosensors integrated into a semiconductor chip technology can lead to major advances in point-of-care applications, food diagnostics, and environmental monitoring through the rapid and precise analysis of various substances. In recent years, there has been an increasing interest in sensors based on photonic integrated circuits (PIC) because they give rise to cost-effective, scalable and reliable on-chip biosensors for a broad market.

The silicon-on-insulator (SOI)-technology is the most attractive technology for PICs from commercial point of view since it provides a scalable platform for mass production.

Once the photonic chip is fabricated, the silicon surface of the sensor can be coated with a covalently attached sensing layer. This layer determines the specific detection and, hence, the application. This step, however, is independent from the fabrication of the chip, making the PIC-technology attractive for both, science and industry. A further advantage of PIC-based biosensors is the possibility to realize sensor arrays. This allows for the detection of several substances in parallel (multiplexing).

This course provides an introduction to chip-integrated photonic biosensors. The course is divided in the following sections:

1. Introduction to photonic biosensor in a chip-technology
2. Fundamentals of chip-integrated photonic biosensors
3. Sensing mechanisms and detection limits
4. Future aspects and overview of ongoing research

DATE: 03.12.2020

TIME: 11:30 – 13:00