

Title: Photonic integrated sensors for life science

Abstract. In the first part of the talk a brief introduction on the principles of photonic integrated sensors applied in life science will be given. The different types of sensors discussed will range from simple waveguide over Mach-Zehnder interferometric sensors to photonic crystal and whispering gallery mode sensors (WGM sensors). After a brief glimpse on recent progress towards single-molecule detection and commercial sensor systems a overview of FBK's research on integrated optical circuits based on silicon-oxynitride waveguides will be given. The sensing device is based on a multiple SiON microring resonators array, fiber coupled to 850 nm VCSEL and silicon photodetectors, packaged with a microfluidic circuit. The sensor fabrication and characteristics will be explained and examples on the results of sensing experiments on the toxin Aflatoxin AFM1 will be shown.