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Biosensing with silicon ring resonators: special platforms and applications

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Silicon photonics has emerged as a very attractive platform for biosensor devices, because it offers the potential to fabricate high-performance label-free transducers at a very low cost. This high-index contrast material system also allows to integrate a large number of components on a single chip, leading naturally to a high degree of multiplexing. The waveguide-based technology also enables the design freedom at circuit level to create novel sensors geometries and photonic networks which improve or enhance the sensor performance.

In this talk, we will discuss how this technology can be introduced in a number of platforms and form factors (fibres, digital microfluidics, Eppendorf, ..). We will also illustrate how the applicability of these sensors can be extended, e.g. towards measuring of conformational changes of biomolecules. We will also discuss how to address the issue of peak splitting, which can be detrimental to sensor performance in an integrated context.

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