Detection and control of surface nanostructures at water liquid interface for sensing

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The detection of contamination in natural water gains increasing importance due to health concerns. Real time monitoring of contamination can significantly reduce the health risk. Optical methods are preferred in these applications since they offer sensitive, *in situ* and non-destructive measurement possibilities. To identify the contamination, specific binding has to be realized.

Our approach is to use genetically modified bacterial filaments to ensure this specific detection. Using *in situ* ellipsometry measurements our aim is to understand the adsorption process and the 3D evolution of the filament sensor layer. To achieve high sensitivity *in situ* ellipsometry measurements we have built a Kretschmann-Raether cell [1,2].

With the help of the surface plasmon resonance (SPR) phenomenon combined with spectroscopy in a broad wavelength range, the sensitivity of the detection was largely increased. The phase information of the reflected beam enabled the increase of the sensitivity compared to traditional SPR devices [3,4].

The main goal of these investigations is to get a more comprehensive understanding about the adsorption of genetically modified flagellar filaments (FFs) since they have the potential of gaining an increasing application in future biosensors.

Keywords: Protein adsorption; Surface plasmon resonance; Biosensor

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