

Metallic Nanostructures and Surface Plasmon Resonance

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Nanostructured metallic surfaces support surface plasmon (SP) excitations. The resonance conditions depend on the optical properties at the metal-dielectric interface. For instance, the monitoring of the shift of the surface plasmon resonance (SPR) due to molecular adsorption events is a well-established approach in biosensing. The SPR condition also leads to an increase in the electric field at the surface which can be explored for enhanced spectroscopy schemes, such as surface-enhanced Raman scattering (SERS).

In this presentation, we will provide an overview of the recent advances from our group on the fabrication of gold nanostructures, by both nanolithographic and self-assembly methods, and discuss some of their applications. These will include the use of gold structures as nanoelectrodes for single molecule electrochemistry, and the integration of gold and silver nanostructures in microfluidics and fiber optics-based devices for biomedical applications.