

Nanotechnologie et Sonde intégrée de Lumière Résonante : Diagnostic Dynamique des Processus en Matière Molle

-Integrated Sensors and NanoPhotonics for Soft-matter Processes-

Université de Rennes 1, CNRS (Institut de Physique de Rennes) - UMR 6251, F-35000 Rennes

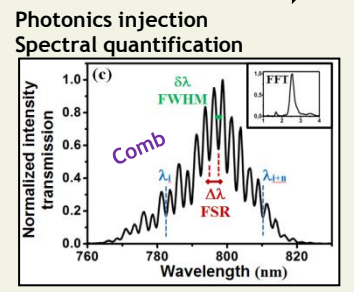
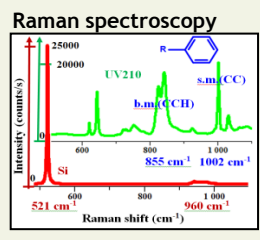
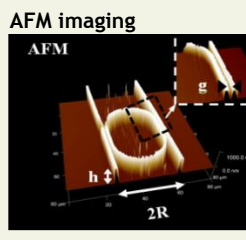
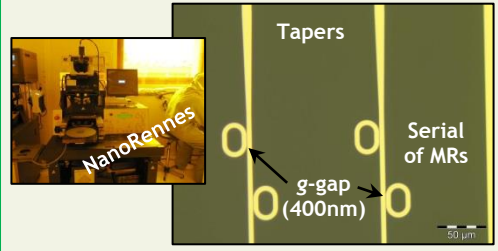
Université de Rennes 1, CNRS (Institut d'Électronique et de Télécommunications de Rennes) - UMR 6164, F-35000 Rennes

... collaboration with Centrale/SupElec Rennes

At the University of Rennes (IPR - IETR CNRS) we started a new field of research, working since a few years in the development of various micro-resonators based on hybrid nanotechnologies which combine the use of polymers and plasma treatments, fluidic and soft matter concepts. Our research work covers both the theoretical description of the physical aspects of these nanophotonic devices and also the technologies, the characterization and their applications as integrated sensors in metrology for soft matter processes.

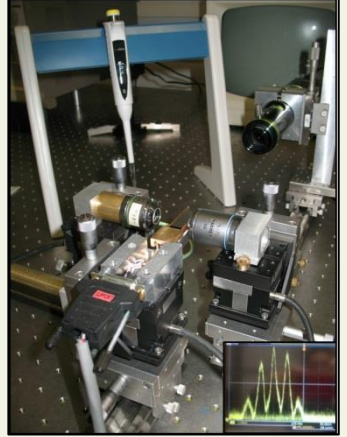
Nanotechnology and photolithography (deep UV@248 nm) / Quality control (AFM,Raman) / Photonics (MicroResonators)

Design / Thin layer Processes in clean room



Sensors / Metrology / Dynamic of Soft Matter processes / Detection / Applications (no-exhaustive)

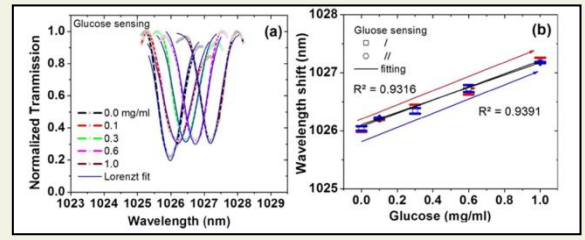
Experimental Platform / Sensors



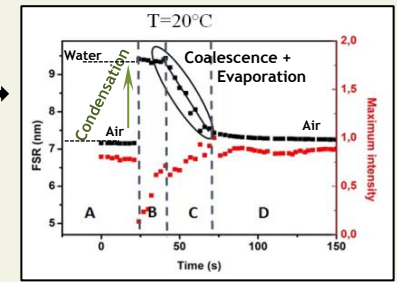
Dynamic of Whispering Gallery Modes (WGM) / Time tracking



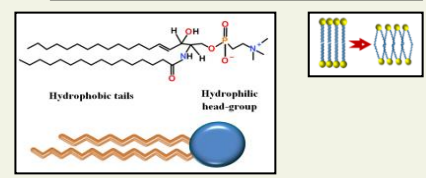
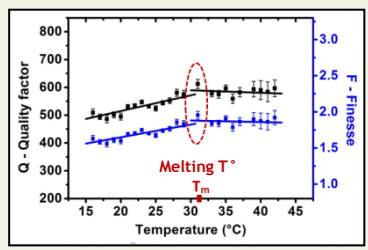
i) Analytes sensing (glucose...)



ii) Steam condensation detection
Humidity monitoring (dew-point...)



iii) Detection of phase transition, morphological transition (gel/fluid sphingolipid, ...)



Future : Towards control and measurements at distance and embedded computer systems ...



A few references (no-exhaustive)...

- ♦ J. Micromech. Microeng., 2012, vol. 22, pp. 085016-085024.
- ♦ J. Micromech. Microeng., 2014, vol. 24, pp. 125006-125013.
- ♦ Adv. Dev. Mat., 2015, vol. 1, pp. 80-87.
- ♦ Eur. J. Phys. : Appl. Phys., 2015, vol. 71, pp. 10501.1-10501.6.
- ♦ Sensors Actuators : Physical A, 2017, vol. 263, pp. 707-717.

