SEMINAIRE ISMO

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Tunnelling Induced Luminescence

The field of Plasmonics has long been dominated by the ability of passive structures to concentrate incident electromagnetic radiation into volumes of sub-wavelength dimensions. Though the phenomenon has been exploited efficiently, there has been increasing awareness that the field is lacking without the development of electrically actuated, active plasmonic devices, in which plasmons are generated via inelastically tunnelling electrons.

Here we investigate low voltage electrical generation of surface plasmons at a scanning tunnelling microscope (STM) junction, evidenced via the ensuing light emission. We discuss this rather quaint electro-luminescence phenomenon, in which a rich interplay between quantum mechanical tunnelling, current fluctuations and the plasmonic response of a STM junction gives rise to a spectrally tuneable nanoscale light source. Theoretical understanding of the experimental observations are presented to explore the underlying physics and scope of electrical actuation and control of plasmons. The investigations display the unique role of plasmon-mediated light emission as a tool to probe optical frequency fluctuations in electronic systems that would otherwise be impractical. It also showcases the flexibility of the STM to conduct spatially resolved optical spectroscopy along with the well discussed electronic spectroscopy.

Attention Jour et horaire inhabituels

Lundi 10 juillet 2017 à 10h

Bât. 210 – Amphi 1 (2ème étage)

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