



SEMINAIRE ISMO

Andrei G. BORISSOV

Institut des Sciences Moléculaires d'Orsay (ISMO), Orsay - France

Tunneling and nonlocality in plasmonics, classical model for quantum effects.

Plasmonic systems in close proximity are strongly affected by nonlocal response and quantum tunneling resulting in modification of the optical spectra. While these effects can be rigorously addressed within the framework of the time-dependent density functional theory, the main restriction of the quantum calculations is the limited number of electrons that can be treated exactly. The actual size of the particles addressed so far is of about 1-2 nm. Thus, the challenge is to include the quantum effects into the classical approach based on the solution of Maxwell equations which would allow description of realistic size systems.

On the example of strongly coupled dimers of plasmonic nanoparticles we will describe the main steps toward the build up of this approach (the quantum-corrected model). We could reach a quantitative account of the modification of the optical response due to the appearance of the tunneling through the junction between the particles. This allows to retrieve the quantum results for the small systems and to explain the experimental data for large plasmonic systems.

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Mardi 16 avril 2013 à 11h
Bât 351 – 2^{ème} étage (Bibliothèque)
Université Paris-Sud 91405 ORSAY Cedex