



Optics and Spectroscopy (OS)

OS3: Characterization and modeling of plasmonic nanoparticles optical properties: advances and recent trends

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This minicolloquium is dedicated at updating the knowledge and sharing the recent advances in the characterization and the modeling of the optical properties of metallic nanoparticles-based materials. New fabrication methods allow either bottom-up or top-down manufacturing materials containing plasmonic nanoparticles with the aim of modifying the properties of emitting sources, harvesting and redirecting light, filtering electromagnetic waves spectrally or creating new polarization states. These exciting new effects are obtained by coupling metallic nanostructures with different types of nanoparticles (metallic, semiconductor, dielectrics and hybrids) and/or emitters. Due to their non-destructive nature and intrinsic sensitivity, spectroscopic techniques (ellipsometry, reflectivity, photoluminescence, Raman...) are highly appropriate to probe the microscopic interaction among these objects and their manifestations at the macroscopic scale, provided that analysis methodologies and models are developed. Different theoretical and numerical models are proposed with emphasis on describing the microscopic interactions among nanostructures taking into account their actual geometries, internal structure and compositions. These models benefit from the combinations of complementary measurement techniques, structural and optical. Conversely, these theoretical efforts will provide new tools for the process control of materials and as structural characterization tools.

The breakthroughs in the field of material science, characterization and modeling of nanoparticles optical properties are addressed by numerous groups. There is a broad spectrum of applications using optics at the frontier between different domains of physics, chemistry,

optics, biology, medicine... This minicolloquium is an appropriate and timely platform to open discussions and to share the latest developments in the field and initiate new collaborations.

Key Words: Optical properties; Electronic properties; Plasmonic responses; Effective medium modeling; Ellipsometry

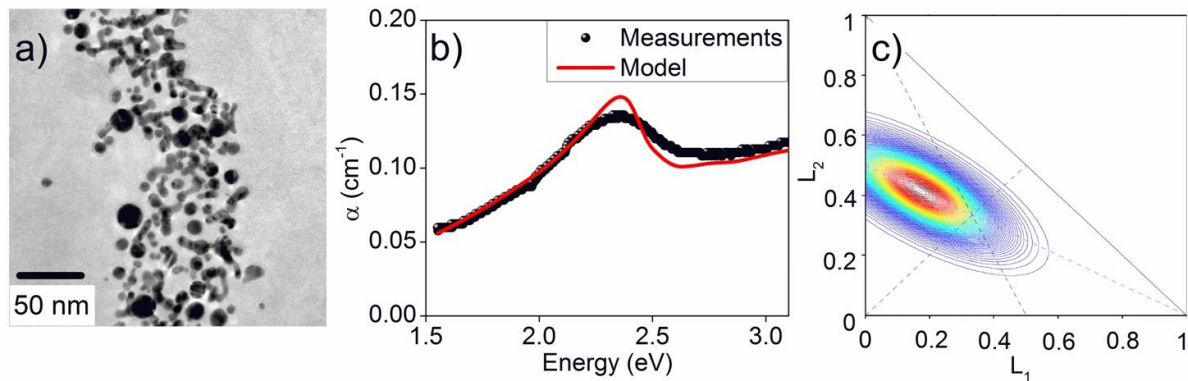


FIG. (a) TEM image of Au NPs obtained by pulsed laser ablation. (b) Comparison between the measured absorption spectrum in solution and the modeled one using a modified Maxwell-Garnett theory taking into account the shape distribution. (c) Distribution of depolarization parameters (L_1 , L_2) used in the modified Maxwell-Garnett theory. The distribution is centered on the prolate axis confirming that Au NPs are mainly composed of nanorods and elongated NPs.

Talk: 15 min (including discussion).

Language: English (preferred) or French.

Registration on the conference website: jmc15.sciencesconf.org

Important dates:

April 15th 2016: Deadline for student grant application.

May 1st 2016: Deadline for abstract submission.

May 15th 2016: Notification of acceptance for oral

July 21st 2016: End of on-line registration to JMC15. On-site registration will still be possible.