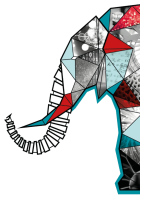
25e Congrès Général de la Société Française de Physique



ID de Contribution: **211** Type: **Orale**

Second-harmonic generation (SHG) of single dielectric nanoparticles for bio-imaging

mercredi 10 juillet 2019 09:45 (15 minutes)

We are studying the optical properties of dielectric nanoparticles in order to use their SHG signal as a label to track the proteins onto which they will be grafted. Why SHG ? The non-resonant process and therefore better photo-thermal stability is expected unlike most fluorescent bio-labels. Most important is the anisotropic character of SHG, advantageously enabling to follow protein rotations.
An inverted confocal microscopy device coupled to an atomic force microscope (AFM) was developed to allow the simultaneous characterization of the topography and SHG properties of single nano-objects.
The first studies were conducted on SiC nanoparticles obtained following crushing and chemical treatment but resulting in polycrystalline aggregates that do not show any significant signal change with polarization. Other BaTiO3 nanoparticles, synthesized colloidally, produce single monocrystals. Analyses of their SHG signal emitted as a function of polarization give the theoretical responses expected from the non-linear susceptibility tensor associated to the crystals tetragonal symmetry, in accordance with their orientations as evidenced by AFM. We are now investigating the SHG dependence as a function of the excitation wavelength to understand and quantify the role of Mie resonances.
Acknowledgements: C Bogicevic for crystal synthesis, F Marquier and F Treussart for sample preparation. Labex NanoSaclay, ANR-10-LABX-0035 (nanoMOUV) and ANR-18-CE09-0027-02 (SINAPSE) for financial help.

Choix de session parallèle

3.4 SFO et PSV: Photonique et science du vivant

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Classification de Session: Séance Parallèle