

Investigation of the interaction of electromagnetic waves with micro and nanostructures using the finite difference time domain method and rigorous coupled wave theory

Objectives

- Numerically investigate the nature and the magnitude of the photoinduced interaction in different 2D and 3D systems, using rigorous finite difference time domain software tools (OptiFDTD) and CSL.
- The applicability of using these results in order to simulate the dynamics of a nanoparticle suspension using microfluidic packages like CONVENTORWARE or ANSYS are assessed.

Partners involved and roles

- IMT - Bucharest: Modelling and simulation of the self assembled 2D and 3D photonic crystals using finite difference time domain method (FDTD).
- CSL+ Univ Liege: Modelling and investigating the light interaction with 2D structures using rigorous coupled wave theory (RCWT).

Summary of results

- Design and simulation of test structures
- Investigation of the EM waves with test structures

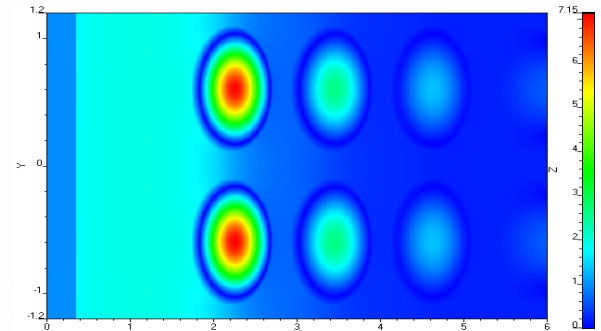
Offer to industry

- Models for obtaining self-assembled photonic crystals using light induced interaction
- Rigorous analysis of the resonant and plasmonic nanostructures

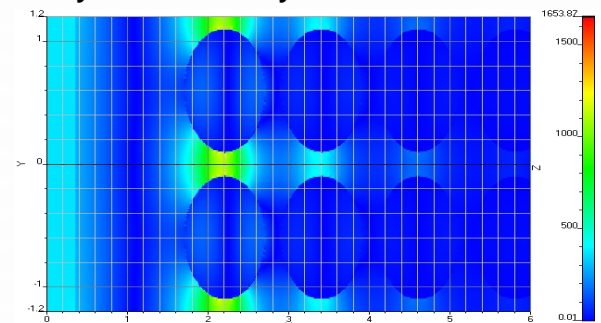
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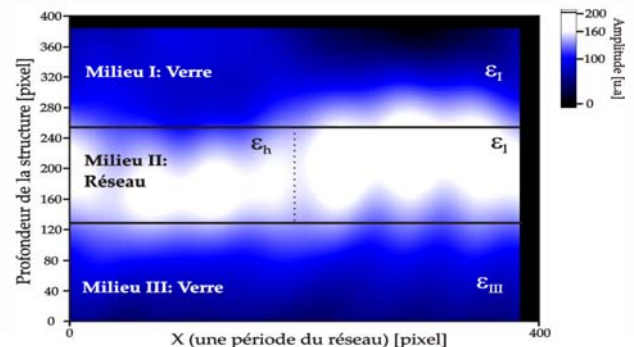
Project status Simulation and model validation are underway



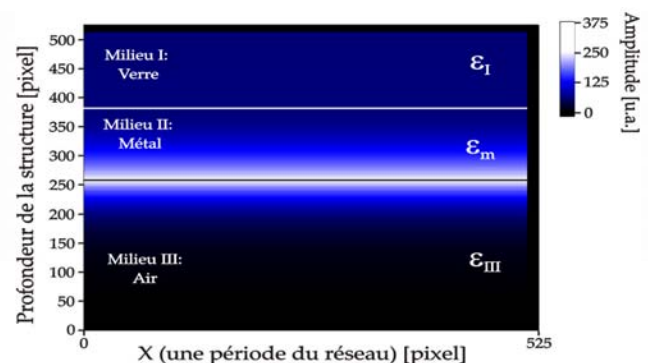
Magnetic field configuration in a 2D photonic crystal obtained by FDTD method



Electric field configuration in a 2D photonic crystal obtained by FDTD method



Guided mode resonance in a 2D structure obtained by RCWT



Plasmon configuration in a 2D structure obtained by RCWT