XXII
INTERNATIONAL WORKSHOP ON OPTICAL WAVE & WAVEGUIDE THEORY AND NUMERICAL MODELLING

NICE, FRANCE
JUNE 27 & 28, 2014

ABSTRACT BOOK

OWTNM 2014 - Abstract Book

Saturday, 28th of June

8h30-10h15 : Methods and Modelling 2

O-6.0 *Numerical modeling of time-domain nanophotonic applications using a discontinuous finite element type method*
C. Scheid, S. Lanteri (invited), R. Léger, J. Viquerat

O-6.1 *A Dirichlet-to-Neumann approach for the exact computation of guided modes in photonic crystal waveguides*
S. Fliss

O-6.2 *A multigrid solver with adaptive time-stepping for the WDM SOA response*
J. Bos, C. Vagionas, R. Stoffer

O-6.3 *An eigenmode expansion technique for modeling Kerr-nonlinear waveguide structures*
J. Petráček

O-6.4 *Modeling of nonlinear nanoplasmonic and nanophotonic directional couplers*
P. Koška, P. Kwiecien, I. Richter, J. Čtyroký

10h45-12h30 : Posters session

13h45-15h15 : Gratings and spectral filtering

O-7.0 *Subwavelength gratings for the filtering of light (spectral, spatial and polarization)*
R. Haidar (invited), P. Bouchon, P. Chevalier, J. Jaeck, Q. Lévesque, F. Pardo, J.-L. Pelouard, C. Tardieu, G. Vincent

O-7.1 *Coupled-wave analysis of the unexpectedly low-loss plasmon-triggered switching between orders diffracted by a metal grating*
E. Mounkala, A.V. Tischenko, O. Parriaux

O-7.2 *Optical quasimodes and their application to infrared spectral filtering*
B. Vial, G. Demésy, A. Nicolet, F. Zolla, M. Commandré, T. Begou, C. Hecquet, S. Tisserand, F. Bedu, H. Dallaporta

O-7.3 *Tunability of plasmonic surface lattice resonances via experiments and numerical mode analysis*
A. Abass, S.R.K. Rodriguez, J. Gomez Rivas, B. Maes

15h45-17h15 : Photonic devices and applications

O-8.0 *The relevance of group delay for refractometric sensing*
H. J.W.M. Hoekstra (invited) and M. Hammer

O-8.1 *Thermo-plasmonic optical switches at telecom wavelengths*
J.-C.Weeber, K. Hassan, M. Nielsen, T. Bernardin, S. Kaya, C. Finot, J. Fatome

O-8.2 *Modeling of microring resonators with high dispersion induced by a one dimensional photonic crystal*
D. Urbonas, M. Gabalis, S. Malaguti, A. Parini, G. Bellanca, R. Petruskevicius

O-8.3 *Second Order Sensitivity Analysis for a Photonic CrystalWaveguide Bend*
Z. Hu, Y.-Y. Lu

Tunability of plasmonic surface lattice resonances via experiments and numerical mode analysis

A. Abass[1], S.R.K. Rodriguez[2], J. Gomez Rivas[2,3], B. Maes[4,5,*]
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Angle-dependent measurements on arrays of metallic nanorods are confronted with various numerical simulations. We analyze in-depth the properties of surface lattice resonances in these systems, which are coupled excitations of localized surface plasmon resonances and Rayleigh anomalies.

Introduction

When in-plane diffraction is occurring via metallic particles, one has the possibility to excite interesting hybrid photonic-plasmonic modes. We examine the tunability, angular dispersion and field profile of these so-called surface lattice resonances via experiments and numerical simulations.

Summary

Experimentally we vary the nanoparticle width, so that various detunings of the localized mode and the in-plane diffraction (or Rayleigh anomaly) are observed (Fig. 1 left). Numerically we can elucidate these properties via analysis, amongst others, of the eigenmode profiles, their spatial extension and the radiative properties (Fig. 1 right). The extensive range of properties such as narrow and wide spectral responses, bright and dark angular spectra etc. allows for various applications [1].

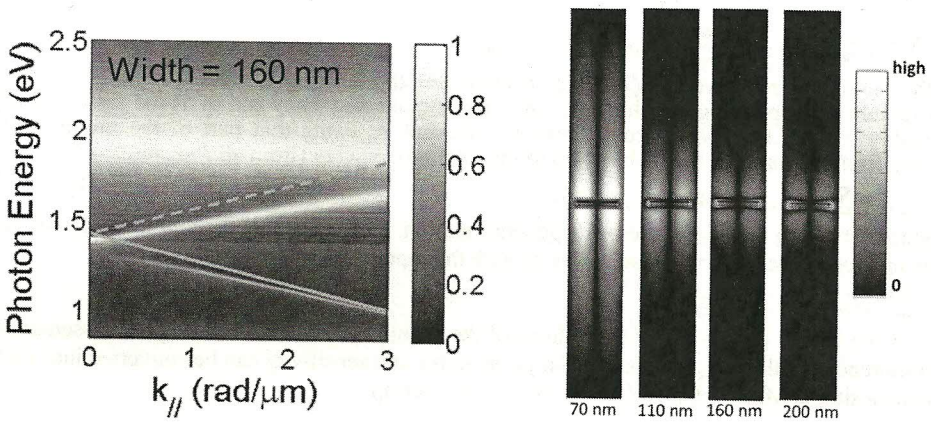

Fig. 1. (Left) Example of an experimental angular extinction spectrum in function of energy and propagation constant. (Right) Calculated eigenmode profile for various particle widths.

Reference

[1] A. Abass, S.R.K. Rodriguez, J. Gomez Rivas, B. Maes, *Tailoring Dispersion and Eigenfield Profiles of Plasmonic Surface*, ACS Photonics, 1(1), p61-68, 2014