

8th International Conference and Exhibition on

LASERS, OPTICS & PHOTONICS

November 15-17, 2017 | Las Vegas, USA

Surface plasmon polaritons in nanostructured metamaterials

Tatjana Gric

Vilnius Gediminas Technical University, Lithuania

The presence of electromagnetic waves on two-dimensional interfaces has been extensively studied over the last several decades. Surface plasmonic polariton (SPP), which normally exists at the interface between a noble metal and a dielectric, is treated as the most widely investigated surface wave. SPPs have promoted new applications in many fields such as microelectronics, photovoltaics, near-field sensing, laser technology, photonics, meta-materials design, high order harmonics generation or charged particles acceleration. Recently, it has been shown that by nanostructuring the metal surface, it is possible to modify the dispersion of SPPs or excite the SPPs in a prescribed manner. Hyperbolic metamaterials, being special kind of anisotropic metamaterial with dielectric tensor elements having the mixed signs, have attracted growing attention due to their ability to support very large wave vectors. Their exotic features give rise to many intriguing applications, such as sub-wavelength imaging and hyper-lens that are infeasible with natural materials. Herein, we discovered the new kinds of surface wave on nanostructured metamaterial, crossing the light line with a substantial portion at lower frequencies lying above the free space light line. Interestingly, the propagation of such surface waves was found to be sensitive to the parameters of the materials employed in nanostructures. Furthermore, the Ferrel-Berreman modes were observed under the certain conditions, opening a gateway towards device fabrications.

Biography

Tatjana Gric is currently working as an Associate Professor at Vilnius Gediminas Technical University and a Visiting Professor at Imperial College London. Prior to becoming an Associate Professor, she was a Leading Engineer of PCB Design at AKIS technologies. Her research interests include nano optics, metamaterials and plasmonics. She has authored and co-authored over 30 journal papers, including *Optics Express* and *Journal of Optics*. Currently, she helps in organizing the International Conference of Computational Methods in Sciences and Engineering.

tatjana.gric@vgtu.lt

Notes: