MAGNETOPLASMONICS: COMBINING MAGNETIC AND PLASMONIC FUNCTIONALITIES

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Nanosystems with combined magnetic and plasmonic functionalities have in recent years become an active topic of research. In these new structures, know as magneto-plasmonics, magnetic and plasmonic properties are intertwined, allowing for example plasmonic properties to become tunable upon de application of a magnetic field (active plasmonics) [1], or the Magneto-Optical (MO) effects to be largely increased by plasmon resonance excitation, as a consequence of the enhancement of the electromagnetic (EM) field in the MO active component of the structure [2]. In this last case, the study of the enhanced MO activity in structures with subwavelength dimensions is especially interesting since they may be viewed as nanoantennas in the visible range with MO functionalities. The light harvesting properties of these systems upon plasmon resonance excitation bring as a consequence an enhanced EM field in its interior, and more interestingly in the region where the MO active component is present [3]. At this stage, optimizing the EM field distribution within the structure by maximizing it in the MO components region while simultaneously minimizing it in all the other, non MO active, lossy components, will allow for the development of novel systems with even larger MO activity with reduced optical losses [4].

References

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