Graphene Nanophotonics

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In this talk I will resume our work on graphene nanophotonics during the last two years. First I will analyze the electromagnetic fields radiated by a nanoemitter placed in the close proximity of a graphene sheet, which present a rich dependence on frequency, distance to the source and orientation of the dipole moment [1]. Then, I will study the propagating characteristics of the two types of graphene surface plasmons (waveguide and edge modes) supported by one-dimensional graphene ribbons [2]. When these graphene ribbons are placed in a periodic fashion, resonant features that lead to enhanced absorption and suppressed transmission emerge in the spectrum [3]. I will also address the coupling between graphene surface plasmons in graphene sheet arrays and the emergence of collective surface plasmons that present anomalous dispersion [4]. In the final part of the talk the capabilities of graphene both to act as a mediator in different light-matter coupling scenarios [5] and to support very deep-subwavelength optical solitons [6] will be discussed.

References

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