

**The cross density of states near a plasmonic surface:
An analytical approach in the electrostatic limit including radiative corrections.**

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Abstract: The concept of cross density of states (CDOS) characterizes the intrinsic spatial coherence of complex photonic or plasmonic systems, independently of the illumination conditions [1]. The CDOS, proportional to the imaginary part of the Green's function connecting two different points, appears as a fundamental quantity in a large number of situations: from determining superradiance and energy transfer between two emitters [2] to high-resolution tomography from ambient seismic noise [3], just to mention a few.

Although the calculation of Green's functions can be performed numerically, simple analytical expressions are often required to gain physical insight and optimize computational approaches. Here we propose a simple analytical extension of the electrostatic approximation [4] based on the radiative corrections usually applied in scattering from small particles [5]. The approximation, that fulfills the optical theorem in absence of absorption, is compared with exact results for both dielectric and plasmonic surfaces.

Acknowledgements: This work was supported by the Spanish Ministerio de Ciencia e Innovación through grant: Consolider NanoLight (CSD2007-00046), as well as by the Comunidad de Madrid (Microseres-CM, S2009/TIC-1476). M.Y. thanks the Mexican Consejo Nacional de Ciencia y Tecnología for a postdoctoral grant.

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