TRIDIMENSIONAL FOURIER TRANSFORM COMPUTATION OF THE SIMULATED MICROSCOPE IMAGE OF NANOPARTICLES

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Computational electrodynamics modeling plays an important role in understanding and designing new photonic devices. The results offered by these simulations are frequently close-range field distributions or angular power emission plots. However, far-field optical images are less common but can serve to verify -with relatively low experimental complexity- the solutions provided by numerical simulations or to correlate features in the optical images with close-range complex interactions that leaves fingerprints in the far field, as in the case of metallic nanostructures excited by light.
To obtain these images, we propose to compute the optical microscopy image using a tridimensional Fourier transform of the far-field scattering simulated data. The method is demonstrated by comparing synthetic images generated using a simplified model of the gold nanowire response with experimental images obtained with a total internal reflection microscope.