Near-field calculation for non-spherical nanoparticle arrays in the framework of the T-matrix method

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Arrays of metal nanoparticles play a key role in many nano-optical applications such as SERS substrates and light concentrators. In this work the T-matrix method (also known as Null-Field Method) has been extended in order to accurately calculate the near-field scattered by large arrays of metallic nanoparticles with non-spherical shape. The near-field scattered by arrays of more than 50 gold spheroids with different aspect ratios, sizes and arranged according to periodic and aperiodic patters are presented when they are excited by a visible radiation.

Fig. 1 Near-field over the each nanoparticle surface for (a) Periodic and (b) Fibonacci distribution of gold nano-ellipsoids with radius=50nm and semi-height=22.5nm. The arrays are excited at wavelength 520nm with a linearly polarized plane wave at normal incidence.

References


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