Abstract

In this paper, the electric resonance characteristics of narrow waist diabolo shape gold metal bar nanoantenna have been investigated. These metal nanostructures induce surface plasmon polrlation (SPP) and localized surface plasmon resonance (LSPR) leading to enhance the absorption and the scattering cross sections characteristics of the antenna. Investigation is done using 3D model Finite Element Method (FEM) numerical simulations and dipole oscillator model. From simulation work, it is found that the relationship between the antenna length and the resonance wavelength is approximatly linear. Also, it is found that as the diabolo antenna waist get narrower, the power dissipation decreases and slightly the resonance wavelength shifted to the higher values. The investigation shows that the electric field amplified in the extremities of the diabolo antenna while the magnetic field $90^\circ$ phase shifted from the electric field and amplified in the waist (middle) of the antenna.

References

- W. Ding, R. Bachelot, R. Espiau de Lamaestre, D. Macias, A. L. Baudrion, and P. Royer, "Understanding near/far-field engineering of optical dimer antennas through geometry modification," 2009, Optics Express
- Z. Pan, J. Guo, "Enhanced optical absorption and electric field resonance in
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