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Title:A novel rectangle plasmonic optical nano-antenna with two protrusions in the middle gap
Authors:Zongheng Yuan (1); Zhiwei Liu (1); Meijie Song (2); Jing Huang (3)
Author affiliation:(1) Sch. of Electron. Eng. & Autom., Guilin Univ. of Electron. Technol., Guilin, China; (2) Sch. of Electron. Eng., Guilin Coll. of Aerosp. Technol., Guilin, China; (3) Sci. & Technol. Div., Guizhou Univ. for Nat., Guiyang, China
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Abstract:The strong field enhancement of a new type of rectangle plasmonic optic nano-antenna with two protrusions in the middle gap is studied by the comparison with two another common rectangle structures using CST software. The intensity of the new type presented in the paper is about 2.5 times more than its common counterpart, up to about 60V/m in the center of antenna, and the position of peak shifts to visible region (406THz) from infrared region (382THz). Further more, the resonant magnitude in the region of corners of protrusions in the middle gap is somewhat larger than that in center region of antenna, and the resonant frequencies all are controlled in the visible range, about 410THz,the results indicate that the protrusions have a good effect on the performance of antenna. Moreover, when a glass substrate is used, the maximum of field magnitude is about 3 times larger than the same structure without substrate, up to 214 V/m, and the resonant frequency red-shifts to about 359THz, which demonstrates that the substrate plays a important role in the excitation of stronger enhancement. The type presented in the paper has a certain reference for the fabrication of high-quality optical nano-antennas and solar cells etc.
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Inspec controlled terms:gold - nanophotonics - plasmonics - red shift
Uncontrolled terms:novel rectangle plasmonic optical nanoantenna - protrusions - strong field enhancement - rectangle structures - CST software - antenna center region - visible region - infrared region - resonant magnitude - resonant frequency red-shifts - solar cells - frequency 406 THz - frequency 382 THz - Au
Inspec classification codes:A4284 - B4146
Numerical data indexing:frequency 4.06E+14 Hz;frequency 3.82E+14 Hz
Chemical indexing:Au/el
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