An Efficient Four Channels 3D Plasmonic Demultiplexer

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Abstract

The four channels of 3D plasmonic demultiplexer structure are selective based, on a nanocavity, that proposed, and numerically simulated, by using the finite, element method by using COMSOL4.4 software package. The required, filtered wavelength can, be investigated, by selecting, an appropriate length of, the nanocavity and refractive index of dielectric that filled nanocavity. The selecting wavelength of for 3D channels are dependent on three geometric parameters thickness, width and length. Four, output channels, structure based, on four perpendicular, nanocavities that, proposed to, design a subwavelength, plasmonic splitter, and demultiplexer. 3D plasmonic demultiplexer with 1 × 4 channels it's peak transmission of four channels occurs at around the wavelengths of 810nm, 990nm, 1210nm and 1500nm, with transmittance efficiency are 57%, 72%, 74%, 70% respectively. Three materials used to build structure, metal used as a silver and two types of dielectric quartz with refractive index 1.5 and air with refractive index 1.

References


23. CHEN Zhao.YU Li,WANG Lu-Lu, ZHAO Yu-Fang, DAN Gao-Yan, XIAO Jing-Hua" High-Resolution Compact Plasmonic Wavelength Demultiplexers Based on Cascading Square Resonators" Vol. 30, No. 5 (2013) 054212.

**Index Terms**

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**Keywords**

Plasmonics, Surface plasmon polration, 3D nanocavity waveguide, resonance wavelength, 3D plasmonic demultiplexer.