PLANAR FAR-FIELD LENSING WITH PLASMONIC NANO-SLIT ARRAYS

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Mohd Fadhullah Bin Abd Halim

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ABSTRACT

PLANAR FAR-FIELD LENSING WITH PLASMONIC NANO-SLIT ARRAYS

In this thesis, a plasmonic nano-slit lensing was investigated theoretically by demonstrating planar lenses based on nano-scale slit arrays in a metallic film. The lens structures consist of optically thick gold films with micron-size arrays of closely spaced and nano-scale slits of varying widths. COMSOL Multiphysics Time-Harmonic Finite-Element (THFE) simulation software was used to design and simulate the research. It was apparent that there was a slight increase of the maximum power as the air slits' widths increase. Whereas, it was also apparent that there was a slight decrease of the maximum power as the gold film's thicknesses increase. Wavelength-scanned was done at various wavelengths ($0.8\ \mu m \leq \lambda \leq 2\ \mu m$) to see the changes of focusing pattern (to show different maximum power).