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Comprehensive microscopic model of the extraordinary optical transmission

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JOSA A, Vol. 27 Issue 12, pp.2542-2550 (2010)
Liu, Haitao; Lalanne, Philippe

As shown in a recent letter [Nature 452, 728 (2008)] with a microscopic model, the phenomenon of the extraordinary optical transmission (EOT) is intrinsically due to two distinct surface waves: the surface plasmon polariton and the quasi-cylindrical wave (quasi-CW) that...

Surface plasmon polaritons locally excited on the ridges of metallic gratings

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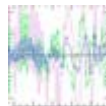


JOSA A, Vol. 27 Issue 6, pp.1432-1441 (2010)
Wang, B; Lalanne, P

With the perspective to achieve an in-depth understanding of metallic periodic surfaces, we study the surface plasmon polaritons that are locally excited on the ridges (between the indentations) of metallic lamellar gratings composed of slits or grooves. An approximate model and fully vectorial...

Discrete-dipole approximation for periodic targets: theory and tests

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JOSA A, Vol. 25 Issue 11, pp.2693-2703 (2008)
Draine, Bruce T; Flatau, Piotr J

The discrete-dipole approximation (DDA) is a powerful method for calculating absorption and scattering by targets that have sizes smaller than or comparable to the wavelength of the incident radiation. The DDA can be extended to targets that are singly or doubly periodic. We generalize the...

Diffraction superresolution elements for radially polarized light

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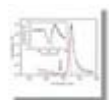


JOSA A, Vol. 27 Issue 6, pp.1355-1360 (2010)
Tan, Qiaofeng; Cheng, Kan; Zhou, Zehai; Jin, Guofan

An optimization method for diffraction superresolution elements (DSEs) for radially polarized light is proposed. Only the longitudinal component of the focused field of radially polarized light is considered for optimization, and the results are 0, p two-phase distributed DSEs. A series of such...

Plasmonic antiresonance through subwavelength hole arrays

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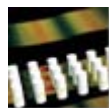


JOSA A, Vol. 28 Issue 3, pp.342-355 (2011)
Maystre, Daniel; Fehrembach, Anne-Laure; Popov, Evgueni

It has been shown both experimentally and numerically that the phenomenon of extraordinary transmission through subwavelength hole arrays is generally associated with a drop in transmission located very close to it. Paradoxically, this antiresonant drop occurs at the wavelength that, at first...

Accurate and versatile modeling of electromagnetic scattering on periodic nanostructures with a surface integral approach

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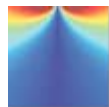


JOSA A, Vol. 27 Issue 10, pp.2261-2271 (2010)
Gallinet, Benjamin; Kern, Andreas M; Martin, Olivier J F

A surface integral formulation for light scattering on periodic structures is presented. Electric and magnetic field equations are derived on the scatterers' surfaces in the unit cell with periodic boundary conditions. The solution is calculated with the method of moments and relies on the...

Approximate model for surface-plasmon generation at slit apertures

[Abstract](#) | Full Text: [PDF](#) | [Enhanced HTML](#) 



JOSA A, Vol. 23 Issue 7, pp.1608-1615 (2006)
Lalanne, P; Hugonin, J P; Rodier, J C

We present a semianalytical model that quantitatively predicts the scattering of light by a single subwavelength slit in a thick metal screen. In contrast to previous theoretical works related to the transmission properties of the slit, the analysis emphasizes the generation of surface plasmons...

Electromagnetic enhancement by a single nano-groove in metallic substrate

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JOSA A, Vol. 27 Issue 7, pp.1555-1560 (2010)
Zhang, Siwen; Liu, Haitao; Mu, Guoguang

We propose systematic investigations of the electromagnetic enhancement by a single nano-groove in gold substrate. The impacts of the groove parameters and of the illumination conditions on the enhanced intensity are explored using a fully vectorial numerical method. The obtained data can be well...

Normal vector method for convergence improvement using the RCWA for

crossed gratings

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JOSA A, Vol. 24 Issue 9, pp.2880-2890 (2007)

Schuster, Thomas; Ruoff, Johannes; Kerwien, Norbert; Rafler, Stephan; Osten, Wolfgang

The rigorous coupled wave analysis (RCWA) is a widely used method for simulating diffraction from periodic structures. Since its recognized formulation by Moharam [J. Opt. Soc. Am. A12, 1068 and 1077 (1995)], there still has been a discussion about convergence problems. Those problems are more or...

Optical angular momentum transfer by Laguerre-Gaussian beams

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JOSA A, Vol. 26 Issue 3, pp.625-638 (2009)

Simpson, Stephen H; Hanna, Simon

It is well known that Laguerre-Gaussian beams carry angular momentum and that this angular momentum has a mechanical effect when such beams are incident on particles whose refractive indices differ from those of the background medium. Under conditions of tight focusing, intensity gradients arise...

Controlling the contribution of the electric field components to the focus of a high-aperture lens using binary phase structures

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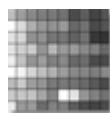
JOSA A, Vol. 27 Issue 10, pp.2188-2197 (2010)

Khonina, Svetlana N; Volotovskiy, Sergey G

We show that the contribution of the electric field components into the focal region can be controlled using binary phase structures. We discuss differently polarized incident waves, for each case suggesting easily implemented binary phase distributions that ensure a maximum contribution of a...

Measurement and modeling of 2D hexagonal resonant-grating filter performance

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JOSA A, Vol. 27 Issue 7, pp.1535-1540 (2010)

Fehrembach, A -L; Gauthier-Lafaye, O; Yu, K Chan Shin; Monmayrant, A; Bonnefont, S; Daran, E; Arguel, P; Lozes-Dupuy, F; Sentenac, A

We report the measurement of a polarization-independent guided-mode resonant filter with a Q factor of ~2200 functioning near normal incidence in the near infrared (850 nm). Besides this remarkable performance, we provide a detailed optical and structural characterization of the component, which...

Multifractal zone plates

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JOSA A, Vol. 27 Issue 8, pp.1851-1855 (2010)

Giménez, Fernando; Furlan, Walter D; Calatayud, Arnau; Monsoriu, Juan A

We present multifractal zone plates (MFZPs) as what is to our knowledge a new family of diffractive lenses whose structure is based on the combination of fractal zone plates (FZPs) of different orders. The typical result is a composite of two FZPs with the central one having a first-order focal...

Surface integral formulation for 3D simulations of plasmonic and high permittivity nanostructures

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JOSA A, Vol. 26 Issue 4, pp.732-740 (2009)
Kern, Andreas M; Martin, Olivier J F

Among the most popular approaches used for simulating plasmonic systems, the discrete dipole approximation suffers from poorly scaling volume discretization and limited near-field accuracy. We demonstrate that transformation to a surface integral formulation improves scalability and convergence...

Multiple annular linear diffractive axicons

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JOSA A, Vol. 28 Issue 4, pp.523-533 (2011)
Bialic, Emilie; de Bougrenet de la Tocnaye, Jean-Louis

We propose a chromatic analysis of multiple annular linear diffractive axicons. Large aperture axicons are optical devices providing achromatic nondiffracting beams, with an extended depth of focus, when illuminated by a white light source, due to chromatic foci superimposition. Annular apertures...

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