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Spectroscopic and laser characteristics of Ti:Al₂O₃



[Abstract](#) | Full Text: [PDF](#) (1698 KB)
JOSA B, Vol. 3, Iss. 1, pp. 125–133 (1986)
P. F. Moulton

Spectroscopic measurements and laser performance of Ti:Al₂O₃ are discussed in detail. Data on absorption and fluorescence spectra and fluorescence lifetime as a function of temperature are presented. Laser characteristics observed with pulsed-dye-laser, frequency-doubled Nd:YAG-laser, and argon-ion-laser pumping are covered and show that nearly quantum-limited conversion of pump radiation can be achieved, along with tuning over the wavelength range 660–986 nm.

Slow-light and evanescent modes at interfaces in photonic crystal waveguides: optimal extraction from experimental near-field measurements



[Abstract](#) | Full Text: [PDF](#) (1167 KB) | Note: a summary of this article is available in OSA's [Spotlight on Optics](#) publication
JOSA B, Vol. 28, Iss. 4, pp. 955–963 (2011)
Sangwoo Ha, Marko Spasenovic, Andrey A. Sukhorukov, Thomas P. White, C. Martijn de Sterke, L. (Kobus) Kuipers, Thomas F. Krauss, and Yuri S. Kivshar

The authors develop a systematic approach for simultaneous extraction of the dispersion relations and profiles of multiple modes in periodic waveguides through a special global optimization procedure applied to near-field electric field measurements in the waveguide plane. They apply this method to perform in-depth analysis of experimental data on wave propagation close to an interface between waveguide sections with different dispersion characteristics, and they successfully identify several modes contributing to the experimentally

measured fields.

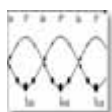
High power fiber lasers: current status and future perspectives [Invited]



[Abstract](#) | Full Text: [PDF](#) (954 KB)
 JOSA B, Vol. 27, Iss. 11, pp. B63–B92 (2010)
 D. J. Richardson, J. Nilsson, and W. A. Clarkson

The rise in output power from rare-earth-doped fiber sources over the past decade, via the use of cladding-pumped fiber architectures, has been dramatic, leading to a range of fiber-based devices with outstanding performance in terms of output power, beam quality, overall efficiency, and flexibility with regard to operating wavelength and radiation format. This success in the high-power arena is largely due to the fiber's geometry, which provides considerable resilience to the effects of heat generation in the core, and facilitates efficient conversion from relatively low-brightness diode pump radiation to high-brightness laser output. In this paper the authors review the current state of the art in terms of continuous-wave and pulsed performance of ytterbium-doped fiber lasers, the current fiber gain medium of choice, and by far the most developed in terms of high-power performance.

Laser cooling below the Doppler limit by polarization gradients: simple theoretical models



[Abstract](#) | Full Text: [PDF](#) (2846 KB)
 JOSA B, Vol. 6, Iss. 11, pp. 2023–2045 (1989)
 J. Dalibard and [C. Cohen-Tannoudji](#) **Nobel Prize winner in Physics 1997**

The authors present two cooling mechanisms that lead to temperatures well below the Doppler limit. These mechanisms are based on laser polarization gradients and work at low laser power when the optical-pumping time between different ground-state sublevels becomes long. There is then a large time lag between the internal atomic response and the atomic motion, which leads to a large cooling force. In the simple case of one-dimensional molasses, they identify two types of polarization gradient that occur when the two counterpropagating waves have either orthogonal linear polarizations or orthogonal circular polarizations.

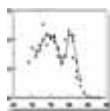
Tailored leaky plasmon waves from a subwavelength aperture for optical particle trapping on a chip



[Abstract](#) | Full Text: [PDF](#) (716 KB)
 JOSA B, Vol. 28, Iss. 4, pp. 602–607 (2011)
 M. S. Muradoglu, Tuck Wah Ng, Adrian Neild, and Ian Gralinski

Optical forces available on a chip that possess features of strong trapping at the subwavelength scale, in a coplanar geometry, and at specific and selective locations portend many useful applications. The authors demonstrate here a two-pronged approach to accomplish this.

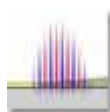
Measurement of two-photon excitation cross sections of molecular fluorophores with data from 690 to 1050 nm



[Abstract](#) | Full Text: [PDF](#) (537 KB)
 JOSA B, Vol. 13, Iss. 3, pp. 481–491 (1996)
 Chris Xu and Watt W. Webb

Measurements of two-photon fluorescence excitation (TPE) spectra are presented for 11 common molecular fluorophores in the excitation wavelength range $690 \text{ nm} < \lambda < 1050 \text{ nm}$. Results of excitation by ~ 100 -fs pulses of a mode-locked Ti:sapphire laser are corroborated by single-mode cw Ti:sapphire excitation data in the range $710 \text{ nm} < \lambda < 840 \text{ nm}$. Absolute values of the TPE cross section for Rhodamine B and Fluorescein are obtained by comparison with one-photon-excited fluorescence, assuming equal emission quantum efficiencies.

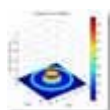
Dynamics of surface plasmon polaritons in plasmonic crystals



[Abstract](#) | Full Text: [PDF](#) (480 KB)
 JOSA B, Vol. 28, Iss. 5, pp. 1111–1117 (2011)
 S. N. Andreev, V. I. Belotelov, D. A. Bykov, L. L. Doskolovich, V. P. Tarakanov, and A. K. Zvezdin

In this work the authors study surface plasmon polariton (SPP) wave-packet dynamics in a new class of plasmonic crystals—plasmonic crystals with monotonically varying-in-space geometrical or optical parameters. Using both a semianalytical approach based on the WKB equations for the SPP dynamics and rigorous electromagnetic modeling [based on the finite-difference time-domain (FDTD) method], they have demonstrated that, by changing the SPP pulse central frequency and spectral bandwidth, it is possible to switch among different important scenarios of the SPP motion: SPP wave-packet acceleration, deceleration, and tunneling to the adjacent plasmonic band.

Investigation of single-mode–multimode–single-mode and single-mode–tapered–multimode–single-mode fiber structures and their application for refractive index sensing



[Abstract](#) | Full Text: [PDF](#) (985 KB)
 JOSA B, Vol. 28, Iss. 5, pp. 1180–1186 (2011)
 Pengfei Wang, Gilberto Brambilla, Ming Ding, Yuliya Semenova, Qiang Wu, and Gerald Farrell

All-fiber in-line single-mode–multimode–single-mode (SMS) and single-mode–tapered–multimode–single-mode (STMS) fiber structures are investigated. A wide-angle beam propagation method in cylindrical coordinates is developed and employed for numerical simulations of the light propagation performance of such fiber devices.

Analysis of plasmon propagation along a chain of metal nanospheres using the generalized multipole technique



[Abstract](#) | Full Text: [PDF](#) (948 KB)
 JOSA B, Vol. 28, Iss. 4, pp. 937–943 (2011)
 S. Mohsen Raeis Zadeh Bajestani, Mahmoud Shahabadi, and Nahid Talebi

The authors compute the dispersion diagram of an infinite chain of silver nanospheres. The Drude model is used to define the permittivity of nanospheres, and the generalized multipole technique (GMT) is applied to solve the Maxwell's equation and, thus, to analyze the plasmon excitation. The obtained dispersion diagram using the GMT is compared with the result of the

dipolar interacting model as well as the quasistatic model.

Transmission resonances in plasmonic metallic gratings



[Abstract](#) | Full Text: [PDF](#) (1448 KB)

JOSA B, Vol. 28, Iss. 2, pp. 253–264 (2011)

G. D'Aguanno, N. Mattiucci, M. J. Bloemer, D. de Ceglia, M. A. Vincenti, and A. Alù

Using the Fourier modal method (FMM) the authors report our analysis of the transmission resonances of a plasmonic grating with subwavelength period and extremely narrow slits for wavelengths of the incoming, transverse magnetic (TM)-polarized, radiation ranging from 240nm to 1500nm and incident angles from 0° to 90° . In particular, they study the case of a silver grating placed in vacuo. Consistent with previous studies on the topic, they highlight that the main mechanism for extraordinary transmission is a TM-Fabry-Perot (FP) branch supported by waveguide modes inside each slit.