

Record 1 of 171

Author(s): Pettazzi, F (Pettazzi, Federico); Coda, V (Coda, Virginie); Fanjoux, G (Fanjoux, Gil); Chauvet, M (Chauvet, Mathieu); Fazio, E (Fazio, Eugenio)

Title: Dynamics of second-harmonic generation in a photovoltaic photorefractive quadratic medium

Source: JOURNAL OF THE OPTICAL SOCIETY OF AMERICA B-OPTICAL PHYSICS, 27 (1): 1-9 JAN 2010

Abstract: We investigate second-harmonic generation (SHG) in a photorefractive photovoltaic medium such as lithium niobate. Our numerical model reveals the complex dynamics of the parametric process during the buildup of the index modification due to the photorefractive (PR) nonlinearity. We investigate a condition in which no external field is applied to the crystal, resulting in a defocusing nonlinearity, as well as the case in which an external bias is applied, producing a self-focusing effect that can enhance the conversion efficiency of the parametric process. We also find the conditions for the initial phase matching and for the background illumination leading to a stable self-confined propagation of the second-harmonic generated light. The developed numerical model shows that as a general case SHG in a self-focusing PR medium results in mode beating inside the generated waveguide, as experimentally observed. (C) 2009 Optical Society of America

ISSN: 0740-3224

Record 2 of 171

Author(s): Fanjoux, G (Fanjoux, Gil); Sylvestre, T (Sylvestre, Thibaut)

Title: All-optical tunable pulse frequency chirp via slow light

Source: OPTICS LETTERS, 34 (24): 3824-3826 DEC 15 2009

Abstract: We theoretically investigate slow light via stimulated Raman scattering, paying special attention to the picosecond regime where chromatic dispersion and cross-phase modulation must be considered. In addition to the control of the Raman pulse walk-off, we demonstrate that the cross-phase-modulation-induced frequency chirp can also be all-optically tuned via Raman slow light. We further demonstrate that this new implication is a consequence of the fact that the group velocity is significantly more affected than the phase velocity in slow-light media. (C) 2009 Optical Society of America

ISSN: 0146-9592

Record 3 of 171

Author(s): Safioui, J (Safioui, Jassem); Devaux, F (Devaux, Fabrice); Chauvet, M (Chauvet, Mathieu)

Title: Pyroliton: pyroelectric spatial soliton

Source: OPTICS EXPRESS, 17 (24): 22209-22216 NOV 23 2009

Abstract: The concept of optical beam self-trapping in pyroelectric photorefractive medium is presented. We show that the temperature controlled spontaneous polarisation of ferroelectric crystals produces an optical nonlinearity that can lead to formation of 2-D spatial soliton named pyroliton. Experimental demonstrations performed in lithium niobate crystals illustrate that efficient self-trapping occurs either for ordinary or extraordinary polarisation under moderate temperature increase. For instance, a 15 μm diameter pyroliton can be formed with a 10 degree temperature raise. (C) 2009 Optical Society of America

ISSN: 1094-4087

Record 4 of 171

Author(s): Sando, D (Sando, Daniel); Jaatinen, E (Jaatinen, Esa); Devaux, F (Devaux, Fabrice)

Title: Reversal of degradation of information masks in lithium niobate

Source: APPLIED OPTICS, 48 (24): 4676-4682 AUG 20 2009

Abstract: We report on the reversal of degradation of information masks stored in self-defocusing lithium niobate. After a long writing time, the image degradation appears as the splitting of refractive-index patterns stored in the medium. The reversal is achieved simply by illuminating the crystal with incoherent light from a halogen lamp. The reversal occurs because the refractive-index changes responsible for the splitting are of a smaller magnitude and are therefore erased first during incoherent illumination. Additionally, we gain insight into the storage, degradation, and erasure dynamics using a time-dependent numerical model of the photorefractive effect in this medium. Since the data can be recovered from a degraded state in which the original data are unrecognizable, this technique could be utilized in such applications as image scrambling or encryption. (C) 2009 Optical Society of America

ISSN: 0003-6935

Record 5 of 171

Author(s): Clemmen, S (Clemmen, S.); Huy, KP (Huy, K. Phan); Bogaerts, W (Bogaerts, W.); Baets, RG (Baets, R. G.); Emplit, P (Emplit, Ph.); Massar, S (Massar, S.)

Title: Continuous wave photon pair generation in silicon-on-insulator waveguides and ring resonators

Source: OPTICS EXPRESS, 17 (19): 16558-16570 SEP 14 2009

Abstract: Silicon waveguides are promising $\chi^{(3)}$ -based photon pair sources. Demonstrations so far have been based on picosecond pulsed lasers. Here, we present the first investigation of photon pair generation in silicon waveguides in a continuous regime. The source is characterized by coincidence measurements. We uncover the presence of unexpected noise which had not been noticed in earlier experiments. Subsequently, we present advances towards integration of the photon pair source with other components on the chip. This is demonstrated by photon pair generation in a Sagnac loop interferometer and inside a micro-ring cavity. Comparison with the straight waveguide shows that these are promising avenues for improving the source. In particular photon pair generation in the micro-ring cavity yields a source with a spectral width of approximately 150 pm resulting in a spectral brightness increased by more than 2 orders of magnitude. (C) 2009 Optical Society of America

ISSN: 1094-4087

Record 6 of 171

Author(s): Delque, M (Delque, M.); Dewandre, A (Dewandre, A.); Huy, KP (Huy, K. Phan); Gorza, SP (Gorza, S. -P.); Haelterman, M (Haelterman, M.)

Title: Modelling the vertical grating-waveguide coupler for the description of its nonlinear symmetry-breaking dynamics

Source: OPTICS COMMUNICATIONS, 282 (17): 3607-3611 SEP 1 2009

Abstract: We propose a new scheme to observe the symmetry-breaking dynamics of two counter-propagating beams in a Kerr-type nonlinear waveguide coupler. Using a grating to couple light at normal incidence upon the waveguide allows for a single-beam geometry. The ability of the grating to couple light symmetrically is demonstrated on the basis of a linear coupled-mode approach especially adapted to vertical coupling. The nonlinear symmetry-breaking dynamics is studied analytically. (C) 2009 Elsevier B.V. All rights reserved.

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DOI: 10.1016/j.optcom.2009.05.076

Record 7 of 171

Author(s): Chauvet, M (Chauvet, Mathieu); Fanjoux, G (Fanjoux, Gil); Huy, KP (Huy, Kien Phan); Nazabal, V (Nazabal, Virginie); Charpentier, F (Charpentier, Frederic); Billeton, T (Billeton, Thierry); Boudebs, G (Boudebs, Georges); Cathelinaud, M (Cathelinaud, Michel); Gorza, SP (Gorza, Simon-Pierre)

Title: Kerr spatial solitons in chalcogenide waveguides

Source: OPTICS LETTERS, 34 (12): 1804-1806 JUN 15 2009

Abstract: Kerr spatial solitons are observed in slab chalcogenide waveguides at near-IR wavelengths. Waveguides are realized either by electron-beam evaporation or rf sputtering of a Ge-Sb-S compound deposited on oxidized silicon wafer. The Kerr coefficient of the thin film is evaluated to be $5 \times 10^{-18} \text{ m}^2/\text{W}$ from the experimentally required soliton power at 1.5 μm . Limitations due to material photosensitivity are revealed. (C) 2009 Optical Society of America

ISSN: 0146-9592

Record 8 of 171

Author(s): Devaux, F (Devaux, Fabrice); Chauvet, M (Chauvet, Mathieu)

Title: Three-dimensional numerical model of the dynamics of photorefractive beam self-focusing in InP:Fe

Source: PHYSICAL REVIEW A, 79 (3): Art. No. 033823 MAR 2009

Abstract: We propose a time-dependent three-dimensional numerical model which successfully explains the complex spatiotemporal dynamic of photorefractive self-focusing of an infrared beam in InP:Fe. Characteristic behaviors are in good agreement with experiments previously reported. Intensity dependence and asymmetric photoinduced index profile are explained. In addition self-trapping dynamics shows potential self-trapping response in the microsecond range.

ISSN: 1050-2947

Article Number: 033823

DOI: 10.1103/PhysRevA.79.033823

Record 9 of 171

Author(s): Safioui, J (Safioui, J.); Chauvet, M (Chauvet, M.); Devaux, E (Devaux, E.); Coda, V (Coda, V.); Pettazzi, F (Pettazzi, F.); Alonzo, M (Alonzo, M.); Fazio, E (Fazio, E.)

Title: Polarization and configuration dependence of beam self-focusing in photorefractive LiNbO₃

Source: JOURNAL OF THE OPTICAL SOCIETY OF AMERICA B-OPTICAL PHYSICS, 26 (3): 487-492 MAR 2009

Abstract: We present numerical and experimental analyses showing the formation of (2+1)D spatial photorefractive solitons at visible wavelengths in electrically biased lithium niobate crystals for ordinary and extraordinary light polarizations. Similarly sized self-trapped beams are observed for both polarizations, despite the polarization-dependent electro-optic coefficients. The tensorial character of the photovoltaic effect is shown to play a key role. The soliton-induced waveguides are able to properly guide telecommunication wavelengths. Finally, a higher degree of anisotropy is observed for ordinary polarized solitons for specific electro-optic configurations, which reveals the presence of the photorefractive field component perpendicular to the applied field. Experimental results are confirmed by a time-dependent numerical model. (C) 2009 Optical Society of America
ISSN: 0740-3224

Record 10 of 171

Author(s): Sylvestre, T (Sylvestre, T.); Kudlinski, A (Kudlinski, A.); Mussot, A (Mussot, A.); Gleyze, JF (Gleyze, J. F.); Jolly, A (Jolly, A.); Maillotte, H (Maillotte, H.)

Title: Parametric amplification and wavelength conversion in the 1040-1090 nm band by use of a photonic crystal fiber

Source: APPLIED PHYSICS LETTERS, 94 (11): Art. No. 111104 MAR 16 2009

Abstract: Highly efficient parametric amplification and wavelength conversion have been demonstrated in the 1040-1090 nm band. A nonlinear photonic crystal fiber was used to provide the anomalous dispersion required for phase matching at 1 μm . A 40 dB maximum gain and +35 dB idler conversion efficiency have been achieved in the subnanosecond pulsed regime and by using a spectrally filtered supercontinuum source as a small signal.

ISSN: 0003-6951

Article Number: 111104

DOI: 10.1063/1.3100192

Record 11 of 171

Author(s): Fazio, E (Fazio, Eugenio); Pettazzi, F (Pettazzi, Federico); Centini, M (Centini, Marco); Chauvet, M (Chauvet, Mathieu); Belardini, A (Belardini, Alessandro); Alonzo, M (Alonzo, Massimo); Sibilia, C (Sibilia, Concita); Bertolotti, M (Bertolotti, Mario); Scalora, M (Scalora, Michael)

Title: Complete spatial and temporal locking in phase-mismatched second-harmonic generation

Source: OPTICS EXPRESS, 17 (5): 3141-3147 MAR 2 2009

Abstract: We experimentally demonstrate simultaneous phase and group velocity locking of fundamental and generated second harmonic pulses in Lithium Niobate, under conditions of material phase mismatch. In phase-mismatched, pulsed second harmonic generation in addition to a reflected signal two forward-propagating pulses are also generated at the interface between a linear and a second order nonlinear material: the first pulse results from the solution of the homogeneous wave equation, and propagates at the group velocity expected from material dispersion; the second pulse is the solution of the inhomogeneous wave equation, is phase-locked and trapped by the pump pulse, and follows the pump trajectory. At normal incidence, the normal and phase locked pulses simply trail each other. At oblique incidence, the consequences can be quite dramatic. The homogeneous pulse refracts as predicted by material dispersion and Snell's law, yielding at least two spatially separate second harmonic spots at the medium's exit. We thus report the first experimental results showing that, at oblique incidence, fundamental and phase-locked second harmonic pulses travel with the same group velocity and follow the same trajectory. This is direct evidence that, at least up to first order, the effective dispersion of the phase-locked pulse is similar to the dispersion of the pump pulse. (C) 2009 Optical Society of America

ISSN: 1094-4087

Record 12 of 171

Author(s): Sylvestre, T (Sylvestre, Thibaut); Mussot, A (Mussot, Arnaud); Vedadi, A (Vedadi, Armand); Provino, L (Provino, Laurent); Lantz, E (Lantz, Eric); Maillotte, H (Maillotte, Herve)

Title: System Performances of Fiber Optical Parametric Amplifiers

Source: FIBER AND INTEGRATED OPTICS, 27 (6): 516-531 NOV-DEC 2008

Abstract: The research field of fiber optical parametric amplifiers has steadily expanded over the last two decades as a host of all-optical signal processing techniques have been demonstrated in nonlinear optical fibers such as wavelength conversion, optical regeneration, optical switching, limiting, buffering, and sampling. This article reviews the system performances of these parametric devices such as gain bandwidth, focuses on the main limitations and demonstrates efficient techniques for suppressing them.

ISSN: 0146-8030

DOI: 10.1080/01468030802269787

Record 13 of 171

Author(s): Blanchet, JL (Blanchet, Jean-Luc); Devaux, F (Devaux, Fabrice); Furfaro, L (Furfaro, Luca); Lantz, E (Lantz, Eric)

Title: Measurement of Sub-Shot-Noise Correlations of Spatial Fluctuations in the Photon-Counting Regime

Source: PHYSICAL REVIEW LETTERS, 101 (23): Art. No. 233604 DEC 5 2008

Abstract: We have measured sub-shot-noise quantum correlations of spatial fluctuations in the far-field image of the parametric fluorescence created in a type I beta-barium-borate nonlinear crystal. Imaging is performed at very low light level (0.15 photons per pixel) with an electron multiplying charge coupled device camera. Experimental results overcome the standard quantum limit shot-noise level without subtraction of the variance of the detection noise.

ISSN: 0031-9007

Article Number: 233604

DOI: 10.1103/PhysRevLett.101.233604

Record 14 of 171

Author(s): Fanjoux, G (Fanjoux, Gil); Sylvestre, T (Sylvestre, Thibaut)

Title: Cancellation of Raman pulse walk-off by slow light

Source: OPTICS LETTERS, 33 (21): 2506-2508 NOV 1 2008

Abstract: We theoretically demonstrate in a nonlinear optical fiber system with a narrowband Raman gain that pulse walk-off between the pump and the Raman Stokes waves can be fully compensated for by Raman slow light, leading to group-velocity matching between the interacting waves, greater useful interaction length, and thereby enhanced Raman amplification efficiency. Limitations due to Kerr effect are further discussed. (C) 2008 Optical Society of America

ISSN: 0146-9592

Record 15 of 171

Author(s): Vedadi, A (Vedadi, Armand); Marhic, ME (Marhic, Michel E.); Lantz, E (Lantz, Eric); Maillotte, H (Maillotte, Herve); Sylvestre, T (Sylvestre, Thibaut)

Title: Investigation of gain ripple in two-pump fiber optical parametric amplifiers

Source: OPTICS LETTERS, 33 (19): 2203-2205 OCT 1 2008

Abstract: By using the four-sideband theory, we analyze the gain spectrum in wideband two-pump fiber optical parametric amplifiers and predict gain ripples over the flat gain region. We derive an approximation of their pseudo-periods and discuss methods for reducing their amplitudes. (C) 2008 Optical Society of America

ISSN: 0146-9592

Record 16 of 171

Author(s): Sylvestre, T (Sylvestre, T.); Schroeder, J (Schroeder, J.); Coen, S (Coen, S.); Emplit, P (Emplit, Ph.); Haelterman, M (Haelterman, M.)

Title: Pulse repetition rate multiplication in fibre laser using higher-order passive modelocking

Source: ELECTRONICS LETTERS, 44 (21): 1240-1241 OCT 9 2008

Abstract: A simple technique that allows for the repetition rate multiplication of optical pulse trains generated in passively modelocked fibre lasers is experimentally demonstrated. This is achieved by initiating higher-order passive modelocking by using both a dual-channel fibre Bragg grating and a Fabry-Perot filter inside the fibre cavity. Continuous dark pulse trains with a repetition rate of 60 GHz were generated, which is a four-fold multiplication of the Fabry-Perot free spectral range.

ISSN: 0013-5194

DOI: 10.1049/el:20081185

Record 17 of 171

Author(s): Nguyen, AT (Nguyen, A. T.); Frison, J (Frison, J.); Huy, KP (Huy, K. Phan); Massar, S (Massar, S.)

Title: Experimental quantum tossing of a single coin

Source: NEW JOURNAL OF PHYSICS, 10: Art. No. 083037 AUG 28 2008

Abstract: The cryptographic protocol of coin tossing consists of two parties, Alice and Bob, who do not trust each other, but want to generate a random bit. If the parties use a classical communication channel and have unlimited computational resources, one of them can always cheat perfectly. If the parties use a quantum communication channel, there exist protocols such that neither party can cheat perfectly, although they may be able to significantly bias the coin. Here, we analyze in detail how the performance of a quantum coin tossing experiment should be compared to classical protocols, taking into account the inevitable experimental imperfections. We then report an all-optical fiber experiment in which a single coin is tossed whose randomness is higher than achievable by any classical protocol and present some easily realizable cheating strategies by Alice and Bob.

ISSN: 1367-2630

Article Number: 083037

DOI: 10.1088/1367-2630/10/8/083037

Record 18 of 171

Author(s): Schroder, J (Schroeder, Jochen); Alasia, D (Alasia, Dario); Sylvestre, T (Sylvestre, Thibaut); Coen, S (Coen, Stephane)

Title: Dynamics of an ultrahigh-repetition-rate passively mode-locked Raman fiber laser

Source: JOURNAL OF THE OPTICAL SOCIETY OF AMERICA B-OPTICAL PHYSICS, 25 (7): 1178-1186 JUL 2008

Abstract: We present an extended study of an ultrahigh-repetition-rate Raman fiber laser passively mode-locked through dissipative four-wave mixing. We demonstrate mode locking at 100 and 160 GHz repetition rates, corresponding to harmonic frequencies more than 400,000 times the cavity resonance frequency. By varying the output coupling ratio we are able to change the threshold and slope efficiency of the laser. The maximum average output power achieved was 926 mW, a further twofold increase of the output power reported previously for this type of laser. Further numerical analysis reveals that the main factor limiting the pulse quality of our setup is supermode noise. Subsequently, we experimentally investigate the use of all-fiber subcavity Fabry-Perot filters to reduce the noise and demonstrate a significant improvement in the laser operation. (c) 2008 Optical Society of America.

ISSN: 0740-3224

Record 19 of 171

Author(s): Boucon, A (Boucon, Anne); Fotiadi, A (Fotiadi, Andrei); Megret, P (Megret, Patrice); Maillotte, H (Maillotte, Herve); Sylvestre, T (Sylvestre, Thibaut)

Title: Low-threshold all-fiber 1000 nm supercontinuum source based on highly non-linear fiber

Source: OPTICS COMMUNICATIONS, 281 (15-16): 4095-4098 AUG 2008

Abstract: We present an highly efficient all-fiber compact supercontinuum source that exhibits a nearly flat spectrum from 1.1 μm to 2.1 μm . This broadband infrared optical source is made-up of a highly non-linear fiber pumped by a 1.55 μm self-Q-switched Er-Brillouin nanosecond pulsed fiber laser, which in turn is pumped by a low-power 1480 nm laser diode. In this work we highlight the great potential of highly non-linear fiber for supercontinuum generation with respect to conventional dispersion-shifted fiber by demonstrating a significant 10 dB power enhancement in the short wavelength side of the supercontinuum. (c) 2008 Elsevier B.V. All rights reserved.

ISSN: 0030-4018

DOI: 10.1016/j.optcom.2008.04.024

Record 20 of 171

Author(s): Devaux, F (Devaux, Fabrice); Coda, V (Coda, Virginie); Chauvet, M (Chauvet, Mathieu); Passier, R (Passier, Remy)

Title: New time-dependent photorefractive three-dimensional model: application to self-trapped beam with large bending

Source: JOURNAL OF THE OPTICAL SOCIETY OF AMERICA B-OPTICAL PHYSICS, 25 (6): 1081-1086 JUN 2008

Abstract: We propose a powerful method to numerically solve the propagation of light in a photorefractive medium in the presence of both applied field and photogalvanic nonlinearity. This time-dependent full three-dimensional model is successfully applied to explain large self-bending of a solitonlike beam observed in biased undoped lithium niobate crystals. It reveals that charge saturation is at the origin of beam bending. The numerical results give deep insight of the formation dynamics in agreement with experiments and depict the trajectory of the induced waveguide inside the crystal. (C) 2008 Optical Society of America.

ISSN: 0740-3224

Record 21 of 171

Author(s): Boucon, A (Boucon, A.); Alasia, D (Alasia, D.); Beugnot, JC (Beugnot, J. C.); Melin, G (Melin, G.); Lempereur, S (Lempereur, S.); Fleureau, A (Fleureau, A.); Maillotte, H (Maillotte, H.); Dudley, JM (Dudley, J. M.); Sylvestre, T (Sylvestre, T.)

Title: Supercontinuum generation from 1.35 to 1.7 μm by nanosecond pumping near the second zero-dispersion wavelength of a microstructured fiber

Source: IEEE PHOTONICS TECHNOLOGY LETTERS, 20 (9-12): 842-844 MAY-JUN 2008

Abstract: We experimentally study a new regime for supercontinuum (SC) generation in the nanosecond pulsed regime using a microstructured optical fiber with two zero-dispersion wavelengths (ZDWs). Pumping at 1535 nm around the second ZDW yields a nearly flat SC over 1350-1700 nm. The interplay between the effects of modulation instability and stimulated Raman scattering are described through simple phase-matching relations.

ISSN: 1041-1135

DOI: 10.1109/LPT.2008.921824

Record 22 of 171

Author(s): Lantz, E (Lantz, Eric); Devaux, F (Devaux, Fabrice)

Title: Parametric amplification of images: From time gating to noiseless amplification

Source: IEEE JOURNAL OF SELECTED TOPICS IN QUANTUM ELECTRONICS, 14 (3): 635-647 MAY-JUN 2008

Abstract: Image parametric amplification and its applications are reviewed in this paper. Phase matching conditions allow the resolution to be determined and spatial frequency filtering to be performed. The phase conjugate idler image can be used to cancel aberrations. Then, time gating properties are applied to ultrafast imaging, imaging through diffusing media, and lifetime fluorescence imaging. Degenerate schemes permit polychromatic amplification as well as phase-sensitive amplification, which is proved to be noiseless with respect to spatial fluctuations at the quantum level. Finally, it is shown that the spatial fluctuations of the signal and the idler are subshot noise correlated.

ISSN: 1077-260X

DOI: 10.1109/JSTQE.2008.918650

Record 23 of 171

Author(s): Passier, R (Passier, Remy); Devaux, F (Devaux, Fabrice); Chauvet, M (Chauvet, Mathieu)

Title: Impact of tensorial nature of the electro-optic effect on vortex beam propagation in photorefractive media

Source: OPTICS EXPRESS, 16 (10): 7134-7141 MAY 12 2008

Abstract: Influence of the anisotropic tensorial electro-optic effect of LiNbO₃: Fe photorefractive defocusing medium on propagation of a vortex beam is numerically and experimentally investigated. Characteristic behaviors are depicted by varying light polarization, sign of vortex angular momentum and propagation directions. (C) 2008 Optical Society of America.

ISSN: 1094-4087

Record 24 of 171

Author(s): Lantz, E (Lantz, Eric); Blanchet, JL (Blanchet, Jean-Luc); Furfaro, L (Furfaro, Luca); Devaux, F (Devaux, Fabrice)

Title: Multi-imaging and Bayesian estimation for photon counting with EMCCDs

Source: MONTHLY NOTICES OF THE ROYAL ASTRONOMICAL SOCIETY, 386 (4): 2262-2270 JUN 1 2008

Abstract: A multi-imaging strategy is proposed and experimentally tested to improve the accuracy of photon counting with an electron multiplying CCD (EMCCD), by taking into account the random nature of its on-chip gain and the possibility of multiple photodetection events on one pixel. This strategy is based on Bayesian estimation on each image, with a priori information given by the sum of the images. The method works even for images with large dynamic range, with more improvement in the low light level areas. In these areas, two thirds of the variance added by the EMCCD in a conventional imaging mode are removed, making the physical photon noise predominant in the detected image.

ISSN: 0035-8711

DOI: 10.1111/j.1365-2966.2008.13200.x

Record 25 of 171

Author(s): Vedadi, AA (Vedadi, Armand A.); Grossard, N (Grossard, Nicolas); Hauden, J (Hauden, Jerome); Lantz, E (Lantz, Eric); Maillotte, H (Maillotte, Herve); Sylvestre, T (Sylvestre, Thibaut)

Title: Demonstration of an integrated LiNbO₃ synchronized double phase modulator and its application to dual-pump fiber optical parametric amplifiers and wavelength converters

Source: JOURNAL OF LIGHTWAVE TECHNOLOGY, 26 (5-8): 777-781 MAR-APR 2008

Abstract: We report the fabrication of an integrated LiNbO₃ Y-junction synchronized double phase modulator fully packaged for RF-application up to 40 GHz. This optical modulator allows for delivering simultaneously counter-phase high-speed modulation and coupling for two input channels. It was designed for application to fiber-optical parametric amplifier and wavelength converters for suppressing idler spectral broadening and signal gain distortion caused by phase modulation itself. With this component, Idler spectral broadening suppression is experimentally demonstrated over all the parametric gain band of a two-pump parametric amplifier operating in the 1.55- μ m region. In addition, we present a useful technique for straightforward and full coupling of the pumps and the signal.

ISSN: 0733-8724

DOI: 10.1109/JLT.2007.916497

Record 26 of 171

Author(s): Fanjoux, G (Fanjoux, Gil); Michaud, J (Michaud, Jeremy); Maillotte, H (Maillotte, Herve); Sylvestre, T (Sylvestre, Thibaut)

Title: Slow-light spatial solitons

Source: PHYSICAL REVIEW LETTERS, 100 (1): Art. No. 013908 JAN 11 2008

Abstract: We numerically and experimentally report the observation of slow-light spatial solitons in a Kerr medium owing to light amplification by stimulated Raman scattering. This was achieved in a CS₂ nonlinear planar waveguide that possesses both a strong self-focusing nonlinearity to generate the spatial Raman soliton and a Raman susceptibility sharp enough to induce the slow-light process simultaneously. We show that the Raman Stokes component is optically delayed by more than 120 ps for a 140 ps Raman pulse duration and only 3 cm of propagation length, while propagating as a spatial soliton beam.

ISSN: 0031-9007

Article Number: 013908

DOI: 10.1103/PhysRevLett.100.013908

Record 27 of 171

Author(s): Pettazzi, F (Pettazzi, Federico); Alonzo, M (Alonzo, Massimo); Centini, M (Centini, Marco); Petris, A (Petris, Adrian); Vlad, VI (Vlad, Valentin I.); Chauvet, M (Chauvet, Mathieu); Fazio, E (Fazio, Eugenio)

Title: Self-trapping of low-energy infrared femtosecond beams in lithium niobate

Source: PHYSICAL REVIEW A, 76 (6): Art. No. 063818 DEC 2007

Abstract: In this paper we report self-trapping of subnanjoule femtosecond near-infrared beams in photonic-grade undoped bulk lithium niobate under application of an external dc electric field. We show that the phenomenon occurs thanks to the photorefractive effect induced by a weak second-harmonic component generated under large velocity mismatch. It offers a way to extend lithium niobate's photorefractive response to the near-infrared spectrum for peak intensity lower than 1 GW/cm², which is three orders of magnitude lower than reported in the literature.

ISSN: 1050-2947

Article Number: 063818

DOI: 10.1103/PhysRevA.76.063818

Record 28 of 171

Author(s): Beugnot, JC (Beugnot, J. -C.); Sylvestre, T (Sylvestre, T.); Alasia, D (Alasia, D.); Maillotte, H (Maillotte, H.); Laude, V (Laude, V.); Monteville, A (Monteville, A.); Provino, L (Provino, L.); Traynor, N (Traynor, N.); Mafang, SF (Mafang, S. Foaleng); Thevenaz, L (Thevenaz, L.)

Title: Complete experimental characterization of stimulated Brillouin scattering in photonic crystal fiber

Source: OPTICS EXPRESS, 15 (23): 15517-15522 NOV 12 2007

Abstract: We provide a complete experimental characterization of stimulated Brillouin scattering in a 160 m long solid-core photonic crystal fiber, including threshold and spectrum measurements as well as position-resolved mapping of the Brillouin frequency shift. In particular, a three-fold increase of the Brillouin threshold power is observed, in excellent agreement with the spectrally-broadened Brillouin gain spectrum. Distributed measurements additionally reveal that the rise of the Brillouin threshold results from the broadband nature of the gain spectrum all along the fiber and is strongly influenced by strain. Our experiments confirm that these unique fibers can be exploited for the passive control or the suppression of Brillouin scattering. (c) 2007 Optical Society of America.

ISSN: 1094-4087

Record 29 of 171

Author(s): Mussot, A (Mussot, Arnaud); Beaugeois, M (Beaugeois, Maxime); Bouazaoui, M (Bouazaoui, Mohamed); Sylvestre, T (Sylvestre, Thibaut)

Title: Tailoring CW supercontinuum generation in microstructured fibers with two-zero dispersion wavelengths

Source: OPTICS EXPRESS, 15 (18): 11553-11563 SEP 3 2007

Abstract: We theoretically study broadband supercontinuum generation in photonic crystal fibers exhibiting two zero dispersion wavelengths and under continuous-wave pumping. We show that when the pump wavelength is located in between the zero-dispersion wavelengths, a wide and uniform spectral broadening is achieved through modulation instability, generation of both blue-shifted and red-shifted dispersive waves and subsequently through soliton self-frequency shift. This supercontinuum is therefore bounded by these two dispersive waves which allow the control of its bandwidth by a suitable tuning of the fiber dispersion. As a relevant example, we predict that broadband (1050-1600 nm) continuous-wave light can be generated in short lengths of microstructured fibers pumped by use of a 10-W Ytterbium fiber laser. (c) 2007 Optical Society of America.

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Record 30 of 171

Author(s): Fressengeas, N (Fressengeas, N.); Khelifaoui, N (Khelifaoui, N.); Dan, C (Dan, C.); Wolfersberger, D (Wolfersberger, D.); Montemezzani, G (Montemezzani, G.); Leblond, H (Leblond, H.); Chauvet, M (Chauvet, M.)

Title: Roles of resonance and dark irradiance for infrared photorefractive self-focusing and solitons in bipolar InP : Fe

Source: PHYSICAL REVIEW A, 75 (6): Art. No. 063834 JUN 2007

Abstract: This paper shows experimental evidence of photorefractive steady state self-focusing in InP:Fe for a wide range of intensities, at both 1.06 and 1.55 μm . To explain those results, it is shown that despite the bipolar nature of InP:Fe where one photocarrier and one thermal carrier are to be considered, the long standing one photocarrier model for photorefractive solitons can be usefully applied. The relationship between the dark irradiance stemming out of this model and the known resonance intensity is then discussed.

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Article Number: 063834

DOI: 10.1103/PhysRevA.75.063834

Record 31 of 171

Author(s): Mussot, A (Mussot, A.); Lantz, E (Lantz, E.); Durecu-Legrand, A (Durecu-Legrand, A.); Simonneau, C (Simonneau, C.); Bayart, D (Bayart, D.); Maillotte, H (Maillotte, H.); Sylvestre, T (Sylvestre, T.)

Title: Simple methods for crosstalk reduction in fiber optical parametric amplifiers

Source: OPTICS COMMUNICATIONS, 275 (2): 448-452 JUL 15 2007

Abstract: We propose and numerically demonstrate two simple methods for reduction of the crosstalk caused by four-wave mixing between the pump and the wavelength-division multiplexed channels in single-pump fiber optical parametric amplifier. The first one is based on a proper tuning of the WDM system from the pump wavelength and the second one uses the Stokes side rather than the anti-Stokes side in the gain band. (c) 2007 Elsevier B.V. All rights reserved.

ISSN: 0030-4018

DOI: 10.1016/j.optcom.2007.03.048

Record 32 of 171

Author(s): Brustlein, S (Brustlein, Sophie); Lantz, E (Lantz, Eric); Devaux, F (Devaux, Fabrice)

Title: Absolute radiance imaging using parametric image amplification

Source: OPTICS LETTERS, 32 (10): 1278-1280 MAY 15 2007

Abstract: We show that parametric image amplification can be used to achieve a 2D radiance map directly expressed in photons per spatiotemporal mode. Radiance images of incoherent signals with less than one photon per mode (typically 10^{-2}) are resolved. (C) 2007 Optical Society of America

ISSN: 0146-9592

Record 33 of 171

Author(s): Huy, KP (Huy, Kien Phan); Nguyen, AT (Nguyen, Anh Tuan); Brainis, E (Brainis, Edouard); Haelterman, M (Haelterman, Marc); Emplit, P (Emplit, Philippe); Corbari, C (Corbari, Costantino); Canagasabay, A (Canagasabay, Albert); Ibsen, M (Ibsen, Morten); Kazansky, PG (Kazansky, Peter G.); Deparis, O (Deparis, Olivier); Fotiadi, AA (Fotiadi, Andrei A.); Megret, P (Megret, Patrice); Massar, S (Massar, Serge)

Title: Photon pair source based on parametric fluorescence in periodically poled twin-hole silica fiber

Source: OPTICS EXPRESS, 15 (8): 4419-4426 APR 16 2007

Abstract: We present observations of quasi-phase matched parametric fluorescence in a periodically poled twin-hole silica fiber. The phase matching condition in the fiber enables the generation of a degenerate signal field in the fiber-optic communication band centered on 1556 nm. We performed coincidence measurements and a Hong-Ou-Mandel experiment to validate that the signal arises from photon pairs. A coincidence peak with a signal to noise ratio (SNR) of 4 using 43 mW of pump power and a Hong-Ou-Mandel dip showing 40% net visibility were measured. Moreover, the experiments were performed with standard single mode fibers spliced at both ends of the poled section, which makes this source easy to integrate in fiber-optic quantum communication applications. (c) 2007 Optical Society of America.

ISSN: 1094-4087

Record 34 of 171

Author(s): Devaux, F (Devaux, F.); Passier, R (Passier, R.)

Title: Phase sensitive parametric amplification of optical vortex beams

Source: EUROPEAN PHYSICAL JOURNAL D, 42 (1): 133-137 APR 2007

Abstract: Optical vortex beams with different topological charges are amplified in a travelling wave phase sensitive parametric interaction. Amplified beams observed either in the near field or in the far field domains exhibit patterns that depend on the relative phase between the pump and the vortex beams. Experimental results are compatible with the conservation of orbital angular momentum of the input beam whatever phase matching conditions.

ISSN: 1434-6060

DOI: 10.1140/epjd/e2007-00014-0

Record 35 of 171

Author(s): Vedadi, A (Vedadi, A.); Alasia, D (Alasia, D.); Lantz, E (Lantz, E.); Maillotte, H (Maillotte, H.); Thevehaz, L (Thevehaz, L.); Gonzalez-Herraez, M (Gonzalez-Herraez, M.); Sylvestre, T (Sylvestre, T.)

Title: Brillouin optical time-domain analysis of fiber-optic parametric amplifiers

Source: IEEE PHOTONICS TECHNOLOGY LETTERS, 19 (2-4): 179-181 JAN-FEB 2007

Abstract: We carried out distributed measurements of the longitudinal gain of fiber-optical parametric amplifiers using a novel sensing technique based on Brillouin optical time-domain analysis. Using this technique, we successfully characterized different gain behaviors in the linear and the saturation regimes. In addition, we demonstrated the recently predicted gain reciprocity at opposite ends of the amplifier span.

ISSN: 1041-1135

DOI: 10.1109/LPT.2006.890039

Record 36 of 171

Author(s): Pettazzi, F (Pettazzi, Federico); Coda, V (Coda, Virginie); Chauvet, M (Chauvet, Mathieu); Fazio, E (Fazio, Eugenio)

Title: Frequency-doubling in self-induced waveguides in lithium niobate

Source: OPTICS COMMUNICATIONS, 272 (1): 238-241 APR 1 2007

Abstract: Efficient frequency-doubling is experimentally demonstrated in presence of beam self-trapping in congruent lithium niobate crystal. The self-trapping is induced by the generated second harmonic beam via photorefractive effect under an external applied field. The local space charge field distribution, formed by the second harmonic beam, is shown to efficiently trap both wavelengths. The dynamics of self-focusing is studied along with the power evolution of the second harmonic beam. Fast tuning of phase matching conditions in the written waveguide is realized by an externally applied voltage also used for the photorefractive confinement. (c) 2006 Elsevier B.V. All rights reserved.

ISSN: 0030-4018

DOI: 10.1016/j.optcom.2006.11.006

Record 37 of 171

Author(s): Delque, M (Delque, Michael); Fanjoux, G (Fanjoux, Gil); Sylvestre, T (Sylvestre, Thibaut)

Title: Polarization dynamics of the fundamental vector soliton of isotropic Kerr media

Source: PHYSICAL REVIEW E, 75 (1): Art. No. 016611 Part 2 JAN 2007

Abstract: We characterize fully the polarization dynamics of the fundamental vector soliton of isotropic Kerr materials by measuring the Stokes parameters of an elliptically polarized self-trapped optical beam propagating in a slab planar waveguide. Our experiment clearly shows that this two-component spatial vector soliton exhibits both the so-called ellipse rotation and curved-shape ellipticity that are due to the self-induced nonlinear birefringence between the two components of the vector soliton. The polarization of the vector soliton is accurately determined both in the transverse and longitudinal directions and comparisons with numerical simulations based on two coupled nonlinear Schrodinger equations provide an excellent quantitative agreement. Spatiotemporal numerical simulations that take into account the finite pulse duration of the experimental input optical beam must, however, be used to match rigorously the measured state of polarization of the vector soliton.

ISSN: 1539-3755

Article Number: 016611

DOI: 10.1103/PhysRevE.75.016611

Record 38 of 171

Author(s): Devaux, F (Devaux, Fabrice); Blanchet, JL (Blanchet, Jean Luc); Lantz, E (Lantz, Eric)

Title: Effective signal-to-noise ratio improvement by parametric image amplification

Source: OPTICS LETTERS, 32 (2): 175-177 JAN 15 2007

Abstract: We show experimentally that parametric optical preamplification greatly improves the signal-to-noise ratio of an image if the detector has a poor quantum efficiency and/or a great level of readout noise. Results are fully consistent with the theory of quantum-noise-limited amplification. (c) 2006 Optical Society of America.

ISSN: 0146-9592

Record 39 of 171

Author(s): Beugnot, JC (Beugnot, Jean-Charles); Sylvestre, T (Sylvestre, Thihaut); Maillotte, H (Maillotte, Herve); Melin, G (Melin, Gilles); Laude, V (Laude, Vincent)

Title: Guided acoustic wave Brillouin scattering in photonic crystal fibers

Source: OPTICS LETTERS, 32 (1): 17-19 JAN 1 2007

Abstract: We experimentally investigate guided acoustic wave Brillouin scattering in several photonic crystal fibers by use of the so-called fiber loop mirror technique and show a completely different dynamics with respect to standard all-silica fibers. In addition to the suppression of most acoustic phonons, we show that forward Brillouin scattering in photonic crystal fibers is substantially enhanced only for the fundamental acoustic phonon because of efficient transverse acousto-optic field overlap. The results of our numerical simulations reveal that this high-frequency phonon is indeed trapped within the fiber core by the air-hole microstructure, in good agreement with experimental measurements. (c) 2006 Optical Society of America.

ISSN: 0146-9592

Record 40 of 171

Author(s): Morand, A (Morand, Alain); Zhang, Y (Zhang, Yang); Martin, B (Martin, Bruno); Huy, KP (Huy, Kien Phan); Amans, D (Amans, David); Benech, P (Benech, Pierre); Verbert, J (Verbert, Jeremy); Hadji, E (Hadji, Emmanuel); Fedeli, JM (Fedeli, Jean-Marc)

Title: Ultra-compact microdisk resonator filters on SOI substrate

Source: OPTICS EXPRESS, 14 (26): 12814-12821 DEC 25 2006

Abstract: The evanescent coupling of a 1.5 μm radius silicon microdisk with one or two Silicon-On-Insulator waveguides is studied. Thanks to the high refractive index contrast between Silica and Silicon materials, this very-small-diameter microdisk exhibits the highest quality factor measured in wavelength range from 1500 nm to 1600 nm. Coupled to a single monomode waveguide, the optical resonator behaves as a stop-band filter. Even if the microdisk is a largely multimode resonator, only its fundamental modes are efficiently excited. The filter's transmission is measured for different gap between the waveguide and the resonator. The critical coupling is clearly observed and gives access to 1.63 nm linewidth. A 20 dB decrease of the transmission signal is also observed. Coupled to two waveguides, the resonator becomes a compact symmetric wavelength-demultiplexer. In this case, the optimal response comes from a compromise between the gap and the desired linewidth dropped in the second waveguide. Finally, our measurements are also compared to analytic models showing a good agreement especially for the critical gap prediction. (C) 2006 Optical Society of America.

ISSN: 1094-4087

Record 41 of 171

Author(s): Fanjoux, G (Fanjoux, Gil); Michaud, J (Michaud, Jeremy); Delque, M (Delque, Michael); Maillotte, H (Maillotte, Herve); Sylvestre, T (Sylvestre, Thibaut)

Title: Generation of multicolor vector Kerr solitons by cross-phase modulation, four-wave mixing, and stimulated Raman scattering

Source: OPTICS LETTERS, 31 (23): 3480-3482 DEC 1 2006

Abstract: We numerically and experimentally show the existence of multicolor vector spatial solitons in a Kerr planar waveguide through the combined effects of cross-phase modulation, four-wave mixing, and stimulated Raman scattering. Mutual spatial guiding of the Raman-Stokes, anti-Stokes, and pump waves is achieved in the high-conversion regime mainly by cross-phase modulation and phase-matched four-wave mixing induced by a power imbalance between Stokes and anti-Stokes components, leading to the generation of a clear-cut sech-shape three-frequency spatial soliton. (c) 2006 Optical Society of America.

ISSN: 0146-9592

Record 42 of 171

Author(s): Schroder, J (Schroder, Jochen); Coen, S (Coen, Stephane); Vanholsbeeck, F (Vanholsbeeck, Frederique); Sylvestre, T (Sylvestre, Thibaut)

Title: Passively mode-locked Raman fiber laser with 100 GHz repetition rate

Source: OPTICS LETTERS, 31 (23): 3489-3491 DEC 1 2006

Abstract: We experimentally demonstrate the operation of a passively mode-locked Raman fiber ring laser with an ultrahigh repetition rate of 100 GHz and up to 430 mW of average output power. This laser constitutes a simple wavelength versatile pulsed optical source. Stable mode locking is based on dissipative four-wave mixing with a single fiber Bragg grating acting as the mode-locking element. (c) 2006 Optical Society of America.

ISSN: 0146-9592

Record 43 of 171

Author(s): Chauvet, M (Chauvet, Mathieu); Fu, GY (Fu, Guoyuan); Salamo, G (Salamo, Gregory)

Title: Assessment method for photo-induced waveguides

Source: OPTICS EXPRESS, 14 (22): 10726-10732 OCT 30 2006

Abstract: A method to probe the guiding characteristics of waveguides formed in real-time is proposed and evaluated. It is based on the analysis of the time dependent light distribution observed at the exit face of the waveguide while progressively altering its index profile and probed by a large diameter optical beam. A beam propagation method is used to model the observed dynamics.

The technique is applied to retrieve the properties of soliton-induced waveguides. (c) 2006 Optical Society of America.

ISSN: 1094-4087

Record 44 of 171

Author(s): Vedadi, A (Vedadi, Armand); Mussot, A (Mussot, Arnaud); Lantz, E (Lantz, Eric); Maillotte, H (Maillotte, Herve); Sylvestre, T (Sylvestre, Thibaut)

Title: Theoretical study of gain distortions in dual-pump fiber optical parametric amplifiers

Source: OPTICS COMMUNICATIONS, 267 (1): 244-252 NOV 1 2006

Abstract: We study analytically and numerically the small signal gain in dual-pump fiber optical parametric amplifiers by including the phase modulation of the pump waves needed for practically increasing the stimulated Brillouin scattering threshold. As for the single-pump case, we show that large signal gain distortions are generated under co-phase modulation, which depend on the rise/fall time of the phase modulation and on the fiber dispersion slope. However, it is clearly confirmed that the counter-phase modulation scheme allows to efficiently suppress these gain distortions over the whole flat gain region. In addition, we demonstrate through realistic numerical simulations that this useful technique overcomes the additional impact of pump-phase modulation to amplitude modulation conversion and zero-dispersion wavelength variations. (c) 2006 Published by Elsevier B.V.

ISSN: 0030-4018

DOI: 10.1016/j.optcom.2006.05.074

Record 45 of 171

Author(s): Auguie, B (Auguie, B.); Mussot, A (Mussot, A.); Boucon, A (Boucon, A.); Lantz, E (Lantz, E.); Sylvestre, T (Sylvestre, T.)

Title: Ultralow chromatic dispersion measurement of optical fibers with a tunable fiber laser

Source: IEEE PHOTONICS TECHNOLOGY LETTERS, 18 (17-20): 1825-1827 SEP-OCT 2006

Abstract: We describe a novel convenient technique to allow for the accurate measurement of the dispersion coefficients till fourth-order in the zero-dispersion wavelength region of single-mode optical fibers. The proposed method is based on a careful spectral analysis of modulation instability occurring in both normal and anomalous dispersion regime and the associated dispersive waves emitted by soliton fission. It simply requires a high-power tunable continuous-wave fiber laser and an optical spectrum analyzer and is able to retrieve both the sign and magnitude of dispersion coefficients with enhanced precision.

ISSN: 1041-1135

DOI: 10.1109/LPT.2006.881148

Record 46 of 171

Author(s): Nguyen, AT (Nguyen, Anh Tuan); Huy, KP (Huy, Kien Phan); Brainis, E (Brainis, Edouard); Mergo, P (Mergo, Pawel); Wojcik, J (Wojcik, Jan); Nasilowski, T (Nasilowski, Tomasz); Van Erps, J (Van Erps, Jurgen); Thienpont, H (Thienpont, Hugo); Massar, S (Massar, Serge)

Title: Enhanced cross phase modulation instability in birefringent photonic crystal fibers in the anomalous dispersion regime

Source: OPTICS EXPRESS, 14 (18): 8290-8297 SEP 4 2006

Abstract: We study Cross Phase Modulational Instability (CPMI) - a particular form of vector modulational instability- in the anomalous dispersion regime in highly birefringent, strongly dispersive, optical fibers. When the pump power is high, the detuning of the Scalar Modulational Instability (SMI) is comparable to the detuning of the CPMI. The gain of the CPMI - which is usually much smaller than the gain of the SMI-, is then strongly enhanced and becomes much larger than the gain of the SMI. This theoretical prediction is well verified experimentally using small core photonic crystal fibers. (c) 2006 Optical Society of America

ISSN: 1094-4087

Record 47 of 171

Author(s): Sylvestre, T; Vedadi, A; Maillotte, H; Vanholsbeeck, F; Coen, S

Title: Supercontinuum generation using continuous-wave multiwavelength pumping and dispersion management

Source: OPTICS LETTERS, 31 (13): 2036-2038 JUL 1 2006

Abstract: We experimentally demonstrate that continuous-wave supercontinuum generation in optical fibers can be significantly enhanced by using both multiwavelength pumping and dispersion management. We show by detailed spectral analysis that continuum enhancement is achieved mainly through a combination of Raman-assisted modulation instabilities, soliton compression, and dispersive wave generation. With this technique, an 800 nm wide (from 1.2 to 2.0 μm) 2 W supercontinuum source is reported that uses a three-wavelength pump and a dispersion-tailored four-optical fibers arrangement. (c) 2006 Optical Society of America.

ISSN: 0146-9592

Record 48 of 171

Author(s): Fanjoux, G (Fanjoux, Gil); Lantz, E (Lantz, Eric); Devaux, F (Devaux, Fabrice); Maillotte, H (Maillotte, Herve)

Title: Stability of spatial soliton arrays generated in a noninstantaneous Kerr medium from partially spatiotemporally coherent light

Source: JOURNAL OF THE OPTICAL SOCIETY OF AMERICA B-OPTICAL PHYSICS, 23 (6): 1099-1108 JUN 2006

Abstract: We demonstrate numerically and experimentally how spatial soliton arrays generated through modulation instability in a planar waveguide with relaxing Kerr nonlinearity can be spatially and temporally destabilized when using a partially spatiotemporally coherent light pulse. However, the amplitude of the shot-to-shot spatial jitter is limited. This jitter depends on the correlation degree of the spatial noise between pulses, and this correlation degree strongly depends on the spatiotemporal coherence of the propagating beam. (c) 2006 Optical Society of America.

ISSN: 0740-3224

Record 49 of 171

Author(s): Chauvet, M; Guo, AQ; Fu, GY; Salamo, G

Title: Electrically switched photoinduced waveguide in unpoled strontium barium niobate

Source: JOURNAL OF APPLIED PHYSICS, 99 (11): Art. No. 113107 JUN 1 2006

Abstract: The unpoled photorefractive strontium barium niobate crystal exhibiting quadratic electro-optic properties is characterized. It is used to form one-dimensional and two-dimensional bright photorefractive spatial solitons for either positive or negative low applied electric field. Solitons induce long-lived index changes in the medium which forms waveguides that can be tuned using an external voltage. (c) 2006 American Institute of Physics.

ISSN: 0021-8979

Article Number: 113107

DOI: 10.1063/1.2202119

Record 50 of 171

Author(s): Coda, V; Chauvet, M; Pettazzi, F; Fazio, E

Title: 3-D integrated optical interconnect induced by self-focused beam

Source: ELECTRONICS LETTERS, 42 (8): 463-465 APR 13 2006

Abstract: The realisation of a 1 x 4 optical integrated routing circuit is reported. The router is composed of multiple adjacent circular waveguides formed with self-focused beams by photorefractive effect inside a congruent photonic-grade lithium niobate wafer. The routing ability of the 3-D optical component is demonstrated and characterised.

ISSN: 0013-5194

DOI: 10.1049/el:20060520

Record 51 of 171

Author(s): Khelifaoui, N; Wolfersberger, D; Kugel, G; Fressengeas, N; Chauvet, M

Title: Temporal behavior of two-wave-mixing in photorefractive InP : Fe versus temperature

Source: OPTICS COMMUNICATIONS, 261 (1): 169-174 MAY 1 2006

Abstract: The temporal response of two-wave-mixing in photorefractive InP:Fe under a dc electric field at different temperatures has been studied. In particular, the temperature dependence of the characteristic time constant has been studied both theoretically and experimentally, showing a strongly decreasing time constant with increasing temperature. (C) 2005 Elsevier B.V. All rights reserved.

ISSN: 0030-4018

DOI: 10.1016/j.optcom.2005.12.001

Record 52 of 171

Author(s): Mussot, A; Lantz, E; Durecu-Legrand, A; Simonneau, C; Bayart, D; Sylvestre, T; Maillotte, H

Title: Zero-dispersion wavelength mapping in short single-mode optical fibers using parametric amplification

Source: IEEE PHOTONICS TECHNOLOGY LETTERS, 18 (1-4): 22-24 JAN-FEB 2006

Abstract: We demonstrate a novel convenient nondestructive method based on optical parametric amplification that allows retrieval of the zero-dispersion wavelength map along a short optical fiber span with a high-spatial resolution. The improved resolution relies on the high sensitivity to the local longitudinal dispersion fluctuations of the parametric high-gain spectrum.

ISSN: 1041-1135

DOI: 10.1109/LPT.2005.860029

Record 53 of 171

Author(s): Jager, R; Gorza, SP; Cambournac, C; Haelterman, M; Chauvet, M

Title: Sharp waveguide bends induced by spatial solitons

Source: APPLIED PHYSICS LETTERS, 88 (6): Art. No. 061117 FEB 6 2006

Abstract: We experimentally demonstrate the ability of a self-guided laser beam to induce waveguides with sharp bends. The beam is a two-dimensional photorefractive screening-photovoltaic bright spatial soliton generated inside a biased lithium-niobate crystal shaped as a prism. The soliton robustness against total internal reflections is shown to leave place to a low-loss unimodal waveguide undergoing multiple zero-radius 90 degrees turns. (c) 2006 American Institute of Physics.

ISSN: 0003-6951

Article Number: 061117

DOI: 10.1063/1.2172649

Record 54 of 171

Author(s): Delque, M; Sylvestre, T; Maillotte, H; Cambournac, C; Kockaert, P; Haelterman, M

Title: Experimental observation of the elliptically polarized fundamental vector soliton of isotropic Kerr media

Source: OPTICS LETTERS, 30 (24): 3383-3385 DEC 15 2005

Abstract: We report the experimental observation of the elliptically polarized fundamental vector soliton of isotropic Kerr media and its unique polarization evolution. This was achieved in the spatial domain in a nonbirefringent CS₂ planar waveguide. (c) 2005 Optical Society of America.

ISSN: 0146-9592

Record 55 of 171

Author(s): Huy, KP; Morand, A; Amans, D; Benech, P

Title: Analytical study of the whispering-gallery mode in two-dimensional microgear cavity using coupled-mode theory

Source: JOURNAL OF THE OPTICAL SOCIETY OF AMERICA B-OPTICAL PHYSICS, 22 (8): 1793-1803 AUG 2005

Abstract: The microgear is a microdisk resonator surrounded by a circular grating. The circular grating increases the modal selectivity of the cavity. In this paper, a two-dimensional (2-D) analytical method that describes the whispering-gallery mode (WGM) in a microgear resonator is presented. The model based on coupled mode theory needs the normalization of the WGM. In the past, some normalizations have been proposed, they all assume the mode to be bound, which is not true as WGMs are leaky modes. A new normalization with no approximation is presented. The numerical integration of the model is compared to 2-D finite-difference time-domain computations. It shows accurate computations of the resonant wavelength with lower numerical complexity. The method can be generalized to any deformation of the microdisk. (c) 2005 Optical Society of America.

ISSN: 0740-3224

Record 56 of 171

Author(s): Chauvet, M; Coda, V; Maillotte, H; Fazio, E; Salamo, G

Title: Large self-deflection of soliton beams in LiNbO₃

Source: OPTICS LETTERS, 30 (15): 1977-1979 AUG 1 2005

Abstract: We report the observation of large self-deflection of 2-D bright photorefractive solitons in LiNbO₃ crystal under a dc applied field. Beam deflection as large as 300 μm after a 7 mm. propagation distance is reported, leading to formation of curved 2-D waveguides. We attribute this large deflection to the low level of impurity acceptors present in the samples, as confirmed by numerical results from a time-dependent photorefractive model. (c) 2005 Optical Society of America.

ISSN: 0146-9592

Record 57 of 171

Author(s): Salvi, J; Roussey, M; Baida, FI; Bernal, MP; Mussot, A; Sylvestre, T; Maillotte, H; Van Labeke, D; Perentes, A; Utke, I; Sandu, C; Hoffmann, P; Dwir, B

Title: Annular aperture arrays: study in the visible region of the electromagnetic spectrum

Source: OPTICS LETTERS, 30 (13): 1611-1613 JUL 1 2005

Abstract: Baida and Van Labeke recently proposed a structure that exhibits a supertransmission of light through an array of nanometric coaxial apertures in a metallic film that has been named an annular aperture array (AAA) [Opt. Commun. 209, 17 (2002); Phys. Rev. B 67, 155314 (2003); J. Microsc. 213, 140 (2003)]. We present the first experimental study, to our knowledge, of an AAA structure in the visible region. For technological reasons, the structure under study does not produce a supertransmission of 80% as in Baida and Van Labeke [Opt. Commun. 209, 17 (2002)]. We built the nanostructure and experimentally recorded its far-field spectral response. This transmission shows only one broad band with a maximum around $\lambda = 700$ nm, giving a maximum efficiency around 17%. A finite-difference time-domain simulation reproduces quite well the

obtained transmission spectrum. (c) 2005 Optical Society of America.

ISSN: 0146-9592

Record 58 of 171

Author(s): Coda, V; Swain, RD; Maillotte, H; Salamo, GJ; Chauvet, M

Title: Wavelength, power and pulse duration influence on spatial soliton formation in AlGaAs

Source: OPTICS COMMUNICATIONS, 251 (1-3): 186-193 JUL 1 2005

Abstract: This work presents the dependence of spatial soliton formation in AlGaAs slab waveguide versus significant parameters such as wavelength, light power, and pulse duration. Comparison between theory and experiments reveals the importance of multiphoton absorption to understand the soliton behavior. Experimental measurements establish some limits of soliton formation such as usable wavelengths and pulse durations. (c) 2005 Elsevier B.V. All rights reserved.

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DOI: 10.1016/j.optcom.2005.02.060

Record 59 of 171

Author(s): Durecu-Legrand, A; Simonneau, C; Bayart, D; Mussot, A; Sylvestre, T; Lantz, E; Maillotte, H

Title: Impact of pump OSNR on noise figure for fiber-optical parametric amplifiers

Source: IEEE PHOTONICS TECHNOLOGY LETTERS, 17 (6): 1178-1180 JUN 2005

Abstract: Electrical measurements of the noise figure of a fiber-optical parametric amplifier are presented and compared with optical measurements. The transfer of pump noise by four-wave mixing was clearly demonstrated. A numerical model was developed to simulate the transfer of pump noise and validated by these measurements. Using this model, we determine, for practical systems, a minimum required pump optical signal-to-noise ratio of 65 dB.

ISSN: 1041-1135

DOI: 10.1109/LPT.2005.846559

Record 60 of 171

Author(s): Mosset, A; Devaux, F; Lantz, E

Title: Spatially noiseless optical amplification of images

Source: PHYSICAL REVIEW LETTERS, 94 (22): Art. No. 223603 JUN 10 2005

Abstract: We present the first experimental demonstration of noiseless amplification of images, where noise refers to spatial quantum fluctuations on the pixels of single shot images. Phase-sensitive and phase-insensitive schemes are compared and the noise figures are in good agreement with theory, inasmuch this theory includes the quantum efficiency of the whole system and the pixel size.

ISSN: 0031-9007

Article Number: 223603

DOI: 10.1103/PhysRevLett.94.223603

Record 61 of 171

Author(s): Vanholsbeeck, F; Coen, S; Emplit, P; Haelterman, M; Sylvestre, T

Title: Coupled-mode analysis of stimulated Raman scattering and four-wave mixing in wavelength-division multiplexed systems

Source: OPTICS COMMUNICATIONS, 250 (1-3): 191-201 JUN 1 2005

Abstract: We present a coupled mode theory that describes the combined action of stimulated Raman scattering and four-wave mixing in wavelength-division multiplexing systems. Our model takes into account the limited Raman bandwidth of silica fibers and is able to predict the nonlinear penalties that affect arbitrarily large WDM systems. With this model, we show numerically that the so-called Raman-induced power tilt reaches a maximum for a total optical bandwidth slightly larger than the Raman frequency shift and decreases beyond that, in contrast to what is predicted by the usual triangular approximation. A new analytical formulation of the Raman tilt is derived that is valid for an arbitrary number of channels and unlimited optical bandwidth. Our investigations also demonstrate that four-wave mixing leads to phase-sensitive periodic energy exchanges among channels that affect the Raman tilt. (C) 2005 Elsevier B.V. All rights reserved.

ISSN: 0030-4018

DOI: 10.1016/j.optcom.2005.02.011

Record 62 of 171

Author(s): Delque, M; Chauvet, M; Maillotte, H; Sylvestre, T

Title: Numerical and experimental investigations of vector soliton bound-states in a Kerr planar waveguide

Source: OPTICS COMMUNICATIONS, 249 (1-3): 285-291 MAY 1 2005

Abstract: We investigate both numerically and experimentally the stability of a vector three-soliton bound state in a Kerr CS, planar waveguide using the circular polarizations as the two-component of the multimode vector soliton (XIVS). The molecular-reorientation-induced Kerr nonlinearity Of CS2 leads in this case to a strength of cross-phase modulation that is 7 times larger than that of self-phase modulation. We demonstrate that, under these conditions, the MVS exhibits symmetry-breaking instability leading to different output intensity patterns ranging from three to one-hump vector solitons. (c) 2004 Elsevier B.V. All rights reserved.

ISSN: 0030-4018

DOI: 10.1016/j.optcom.2004.12.041

Record 63 of 171

Author(s): Durecu-Legrand, A; Mussot, A; Simonneau, C; Bayart, D; Sylvestre, T; Lantz, E; Maillotte, H

Title: Impact of pump phase modulation on system performance of fibre-optical parametric amplifiers

Source: ELECTRONICS LETTERS, 41 (6): 350-352 MAR 17 2005

Abstract: Bit error rate induced in a parametric amplifier has been measured with a 10 Gbit/s line rate. It is shown experimentally that the phase modulation of the pump distorts the mark level of the channel and may cause system penalty. Different phase modulation schemes have been compared.

ISSN: 0013-5194

DOI: 10.1049/el:20047522

Record 64 of 171

Author(s): Huy, KP; Morand, A; Benech, P

Title: Modelization of the whispering gallery mode in microgear resonators using the Floquet-Bloch formalism

Source: IEEE JOURNAL OF QUANTUM ELECTRONICS, 41 (3): 357-365 MAR 2005

Abstract: In this paper, a two-dimensional (2-D) method describing the whispering gallery mode in a microgear resonator is presented. The microgear is a microdisk surrounded by a circular grating. The method, which is based on the Floquet-Bloch formalism, analytically describes the field within the disk and outside the grating. On the other hand, the field within the grating is calculated using a finite-difference scheme in polar coordinates. Matching the boundary conditions, it is possible to work in a forced oscillation regime or in a free oscillation regime (laser mode). The resonant wavelength and quality factor can then be deduced. Compared to the coupled mode theory and to 2-D finite-difference time-domain computations, the method is faster and more accurate. Moreover, a polarization effect of the microgear is demonstrated. The TE polarization experiences a Q-factor improvement contrary to TM polarization. Finally, microgear structures prove to be more efficient than micro flowers.

ISSN: 0018-9197

DOI: 10.1109/JQE.2004.841498

Record 65 of 171

Author(s): Brustlein, S; Devaux, F; Lantz, E

Title: Picosecond fluorescence lifetime imaging by parametric image amplification

Source: EUROPEAN PHYSICAL JOURNAL-APPLIED PHYSICS, 29 (2): 161-165 FEB 2005

Abstract: We report a new method of fluorescence lifetime imaging that uses the ultra-fast optical temporal gating properties of parametric image amplification. Images with different lifetimes in the picosecond range are resolved with reliable and reproducible results.

ISSN: 1286-0042

DOI: 10.1051/epjap:2004204

Record 66 of 171

Author(s): Laude, V; Khelif, A; Benchabane, S; Wilm, M; Sylvestre, T; Kibler, B; Mussot, A; Dudley, JM; Maillotte, H

Title: Phononic band-gap guidance of acoustic modes in photonic crystal fibers

Source: PHYSICAL REVIEW B, 71 (4): Art. No. 045107 JAN 2005

Abstract: The elastic modes guided along the axis of an optical fiber are obtained for an arbitrary finite cross section using waveguide finite element analysis. The band structure of acoustic phonons is obtained from this full-vector computation. The analysis is applied to the case of a photonic crystal fiber possessing a honeycomb lattice. It is shown that this fiber exhibits band gaps for elastic modes propagating along the longitudinal fiber axis. For frequencies within a band gap, the external boundary of the fiber becomes a defect of the phononic crystal that supports the propagation of guided elastic modes. Such boundary modes are very sensitive to the boundary conditions. The further introduction of a defect within the two-dimensional phononic crystal leads

to the formation of highly confined elastic waveguide modes that copropagate in the same core volume as the guided optical mode. We consider the application of these properties to the suppression of stimulated Brillouin scattering and to enhanced collinear acousto-optical interactions. In particular, we obtain the optimum elastic modal shape that maximizes the acousto-optical scattering coefficient for given optical modes.

ISSN: 1098-0121

Article Number: 045107

DOI: 10.1103/PhysRevB.71.045107

Record 67 of 171

Author(s): Vanholsbeeck, F; Coen, S; Emplit, P; Haelterman, M; Sylvestre, T

Title: Raman-Induced power tilt in arbitrarily large wavelength-division-multiplexed systems

Source: IEEE PHOTONICS TECHNOLOGY LETTERS, 17 (1): 88-90 JAN 2005

Abstract: By taking into account the finite Raman bandwidth of silica fibers, we study the so-called Raman-induced spectral power tilt in arbitrarily large wavelength-division-multiplexed systems. Our numerical results reveal that the Raman tilt reaches a maximum for a total optical bandwidth slightly larger than the Raman frequency shift and decreases beyond that, in contrast to what is predicted by the usual triangular approximation. A new analytical formulation of the Raman tilt is derived that is valid for an arbitrary number of channels and unlimited optical bandwidth. An excellent agreement is found with numerical simulations.

ISSN: 1041-1135

DOI: 10.1109/LPT.2004.837726

Record 68 of 171

Author(s): Vanholsbeeck, F; Coen, S; Emplit, P; Martinelli, C; Leplingard, F; Sylvestre, T

Title: Numerical modeling of a four-wave-mixing-assisted Raman fiber laser

Source: OPTICS LETTERS, 29 (23): 2719-2721 DEC 1 2004

Abstract: We present a new numerical model of cascaded Raman fiber lasers that takes into account the chromatic dispersion of the fiber and includes the full spectrum of the intracavity field. This model explains and describes remarkably well a new operating regime found experimentally and reveals that chromatic dispersion is truly a new degree of freedom in the design of cascaded Raman lasers. (C) 2004 Optical Society of America.

ISSN: 0146-9592

Record 69 of 171

Author(s): Fazio, E; Renzi, F; Rinaldi, R; Bertolotti, M; Chauvet, M; Ramadan, W; Petris, A; Vlad, VI

Title: Screening-photovoltaic bright solitons in lithium niobate and associated single-mode waveguides

Source: APPLIED PHYSICS LETTERS, 85 (12): 2193-2195 SEP 20 2004

Abstract: Photorefractive screening-photovoltaic solitons are observed in lithium niobate. Two-dimensional bright circular solitons are formed thanks to a strong static bias field, externally applied, opposite to the photovoltaic internal field. The dynamics of the soliton formation is monitored and compared to a time-dependent numerical model allowing determination of the photovoltaic field. Efficient single mode waveguides are shown to be memorized by the soliton beam for a long time. (C) 2004 American Institute of Physics.

ISSN: 0003-6951

DOI: 10.1063/1.1794854

Record 70 of 171

Author(s): Lescop, B; Galtayries, A; Fanjoux, G

Title: Thermal chemistry of NH₃ on oxygen-pretreated Ni(111) studied by metastable induced electron spectroscopy and ultraviolet photoelectron spectroscopy

Source: JOURNAL OF PHYSICAL CHEMISTRY B, 108 (36): 13711-13718 SEP 9 2004

Abstract: Ammonia adsorption on Ni(111) and on oxygen-pretreated Ni(111) has been studied using metastable induced electron spectroscopy and ultraviolet photoelectron spectroscopy at room temperature. Both techniques allowed us to report on the electronic structure of the valence band. The nickel oxidation leads to the existence of an oxygen-adsorbed phase before NiO growth. So we compared the ammonia reaction toward three types of surfaces: Ni(111), NiO/Ni(111), and O-Ni(111). We observed different ammonia reactivities on these three types of surfaces at room temperature: ammonia molecules were molecularly adsorbed on Ni(111), and were decomposed on oxygen-pretreated Ni(111). After surface heating, ammonia products were dissociated, and adsorbed hydroxyl groups were also seen on O-Ni(111). Above 450 K, no ammonia decomposition products were observed on NiO/Ni(111), whereas Ni(111) and the O-Ni(111) were covered by atomic nitrogen. Its coverage is higher on the O-Ni(111) surface than on the clean Ni(111) surface. This observation proves the high ammonia reactivity toward

adsorbed oxygen. This study shows that the reactivity of oxygen atoms on Ni(111) toward ammonia depends on their characteristics (adsorbed oxygen or oxygen embedded into NiO).

ISSN: 1520-6106

DOI: 10.1021/jp0488158

Record 71 of 171

Author(s): Martinelli, C; Leplingard, F; Borne, S; Bayart, D; Vanholsbeeck, F; Coen, S; Sylvestre, T

Title: Stability enhancement for dual-order Raman fiber lasers

Source: IEEE PHOTONICS TECHNOLOGY LETTERS, 16 (9): 2018-2020 SEP 2004

Abstract: A new laser regime for second-order pumping applications is described. Our laser is a dual-output-wavelength Raman fiber laser that generates a low-power first-order-pump line and a high-power second-order-pump line together. We demonstrate how using four-wave mixing combined to Raman gain in the laser cavity permits better stability of the first-order-pump laser line.

ISSN: 1041-1135

DOI: 10.1109/LPT.2004.831546

Record 72 of 171

Author(s): Mussot, A; Lantz, E; Maillotte, H; Sylvestre, T; Finot, C; Pitois, S

Title: Spectral broadening of a partially coherent CW laser beam in single-mode optical fibers

Source: OPTICS EXPRESS, 12 (13): 2838-2843 JUN 28 2004

Abstract: The nonlinear propagation of a partially coherent continuous-wave laser beam in single-mode optical fibers is investigated both theoretically and experimentally, with a special attention to the zero-dispersion wavelength region where modulation instability is expected. Broadband asymmetric spectral broadening is reported experimentally and found in fairly good agreement with a numerical Schrodinger simulation including a phase-diffusion model for the partially coherent beam. This model shows in addition that the underlying spectral broadening mechanism relies not only on modulation instability but also on the generation of high-order soliton-like pulses and dispersive waves. The coherence degradation which results from these ultrafast phenomena is confirmed by autocorrelation measurement. (C) 2004 Optical Society of America.

ISSN: 1094-4087

Record 73 of 171

Author(s): Lantz, E; Sylvestre, T

Title: Weak-wave advancement in nearly collinear four-wave mixing: comment

Source: OPTICS EXPRESS, 12 (11): 2566-2567 MAY 31 2004

Abstract: The exponential gain predicted in "Weak-wave advancement in nearly collinear four-wave mixing" [Opt. Express 10, 581 (2002)], disappears when all interacting sidebands are properly taken into account. The demonstration closely follows well-established literature in the formally equivalent temporal domain. (C) 2004 Optical Society of America.

ISSN: 1094-4087

Record 74 of 171

Author(s): Couton, G; Maillotte, H; Chauvet, M

Title: Self-formation of multiple spatial photovoltaic solitons

Source: JOURNAL OF OPTICS B-QUANTUM AND SEMICLASSICAL OPTICS, 6 (5): S223-S230 Sp. Iss. SI MAY 2004

Abstract: We have observed self-formation of one-dimensional multiple dark-grey photovoltaic solitons in iron-doped LiNbO₃ samples. The solitons arise from a single initial dark stripe induced by a phase jump in a uniform beam. An odd number of solitons is generated, which depends on the initial stripe width. The dynamics of the soliton formation reveals that the multiple solitons appear in a quasi-steady state regime. Our experimental observations are modelled successfully with a time-dependent nonlinear numerical beam propagation method.

ISSN: 1464-4266

DOI: 10.1088/1464-4266/6/5/009

Record 75 of 171

Author(s): Fanjoux, G; Devaux, F; Lantz, E; Maillotte, H

Title: The generation of spatial soliton arrays in a planar Kerr waveguide from seeded spontaneous parametric down conversion

Source: JOURNAL OF OPTICS B-QUANTUM AND SEMICLASSICAL OPTICS, 6 (5): S250-S258 Sp. Iss. SI MAY 2004

Abstract: The possibility of generating spatial soliton arrays in a nonlinear Kerr waveguide by the spontaneous modulation instability (MI) process strongly depends on the relaxation time of the nonlinear material response and on the characteristics of the spatio-temporal noise added on the injected beam. We address this issue in this paper by considering parametric down conversion generated in a quadratic crystal as a noise source before the Kerr waveguide.

By a full spatio-temporal numerical simulation, we show first that the spontaneous MI process occurs if the spatially noisy beam launched into the waveguide presents a minimal spatial coherence. Second, soliton arrays are formed in an instantaneous Kerr medium only for a temporally quasi-coherent input beam. If the Kerr effect is non-instantaneous, soliton arrays can be formed for temporally noisy beams until a threshold level of temporal coherence is reached.

ISSN: 1464-4266

DOI: 10.1088/1464-4266/6/5/012

Record 76 of 171

Author(s): Lantz, E; Sylvestre, T; Maillotte, H; Treps, N; Fabre, C

Title: Quantum fluctuations and correlations of spatial scalar or multimode vector solitons in Kerr media

Source: JOURNAL OF OPTICS B-QUANTUM AND SEMICLASSICAL OPTICS, 6 (5): S295-S302 Sp. Iss. SI MAY 2004

Abstract: We apply the Green function method to determine the global degree of squeezing and the transverse spatial distribution of quantum fluctuations of solitons in Kerr media. We show that both scalar bright solitons and multimode vector solitons experience strong squeezing on the optimal quadrature. For vector solitons, this squeezing is shown to result from an almost perfect anti-correlation between the fluctuations in the two incoherently coupled circular polarizations.

ISSN: 1464-4266

DOI: 10.1088/1464-4266/6/5/018

Record 77 of 171

Author(s): Lantz, E; Treps, N; Fabre, C; Brambilla, E

Title: Spatial distribution of quantum fluctuations in spontaneous down-conversion in realistic situations - Comparison between the stochastic approach and the Green's function method

Source: EUROPEAN PHYSICAL JOURNAL D, 29 (3): 437-444 JUN 2004

Abstract: We show that in the limit of negligible pump depletion, the spatial distribution of the quantum fluctuations in spontaneous parametric down-conversion can be computed for any shape of the pump beam by using the Green's function method to linearize the quantum fluctuations, even for very low levels of the intensities measured on the pixels. The results are in complete agreement with stochastic simulations of the Wigner distribution. Both methods show specific quantum effects in realistic situations close to the experiments now in progress, like sub-shot noise correlation between opposite pixels in the far field.

ISSN: 1434-6060

DOI: 10.1140/epjd/e2004-00040-4

Record 78 of 171

Author(s): Mussot, A; Durecu-Legrand, A; Lantz, E; Simonneau, C; Bayart, D; Maillotte, H; Sylvestre, T

Title: Impact of pump phase modulation on the gain of fiber optical parametric amplifier

Source: IEEE PHOTONICS TECHNOLOGY LETTERS, 16 (5): 1289-1291 MAY 2004

Abstract: In practice, fiber optical parametric amplifiers are generally driven by a phase-modulated pump wave to avoid stimulated Brillouin back-scattering. We show both analytically and numerically that the phase modulation of the pump can induce strong parametric gain modulation and that this detrimental effect depends both on the rise-fall time of the phase modulator and on the fiber dispersion slope.

ISSN: 1041-1135

DOI: 10.1109/LPT.2004.826123

Record 79 of 171

Author(s): Vanholsheek, F; Coen, S; Emplit, P; Martinelli, C; Sylvestre, T

Title: Cascaded Raman generation in optical fibers: influence of chromatic dispersion and Rayleigh backscattering

Source: OPTICS LETTERS, 29 (9): 998-1000 MAY 1 2004

Abstract: We study experimentally the influence of chromatic dispersion and Rayleigh backscattering on cascaded Raman generation in silica optical fibers. Effects ranging from enhanced spectral broadening of the Stokes orders to generation of higher Stokes order at unexpected wavelengths are observed. Additionally, we show that four-wave-mixing processes can quench the noisy Rayleigh lasing lines generated in power Raman amplifiers. Our observations are confirmed by numerical simulations. (C) 2004 Optical Society of America.

ISSN: 0146-9592

Record 80 of 171

Author(s): Mosset, A; Devaux, F; Fanjoux, G; Lantz, E

Title: Direct experimental characterization of the Bose-Einstein distribution of spatial fluctuations of spontaneous parametric down-conversion

Source: EUROPEAN PHYSICAL JOURNAL D, 28 (3): 447-451 MAR 2004

Abstract: We present, to the best of our knowledge, the first experimental demonstration by direct detection of the Bose-Einstein photon-number distribution of highly spatially multi-mode but temporally single mode spontaneous parametric down-conversion.

ISSN: 1434-6060

DOI: 10.1140/epjd/e2003-00323-2

Record 81 of 171

Author(s): Lescop, B; Jay, JP; Fanjoux, G

Title: Reduction of oxygen pre-treated Ni(111) by H-2 exposure: UPS and MIES studies compared with Monte Carlo simulations

Source: SURFACE SCIENCE, 548 (1-3): 83-94 JAN 1 2004

Abstract: The reduction of oxygen pre-treated Ni(111) under hydrogen has been followed by metastable induced electron spectroscopy (MIES) and ultraviolet photoelectron spectroscopy (UPS) for a substrate temperature of 600 K. Both techniques have allowed us to report on the evolution of the electronic structure of the valence band over hydrogen exposure. These investigations showed the fast formation and desorption of water molecules, but no hydroxyl groups. The oxygen coverage of the surface depends on the Ni 3d band intensity during hydrogen exposure. By using the MIES technique, we observed that the reduction reaction is preceded with a induction period. These periods are not seen with UPS data. This difference can be attributed to the fact that MIES gives information about the outermost layer of the surface, whereas UPS probes the first innerlayers. So it indicates that oxygen atoms are desorbed from the surface, and then subsurface oxygen atoms diffuse to the oxygen-depleted surface. To interpret these experimental results, we carried out simple Monte Carlo simulations based on the fact that the reduction takes place on the surface along the NiO island perimeters. This simulation fits well the experimental data when a lateral mobility of subsurface oxygen atoms is taken into account, i.e. the reaction leads to the reduction of the three-dimension NiO before the outermost layer oxygen desorption. (C) 2003 Elsevier B.V. All rights reserved.

ISSN: 0039-6028

DOI: 10.1016/j.susc.2003.09.051

Record 82 of 171

Author(s): Chauvet, M

Title: Temporal analysis of open-circuit dark photovoltaic spatial solitons

Source: JOURNAL OF THE OPTICAL SOCIETY OF AMERICA B-OPTICAL PHYSICS, 20 (12): 2515-2522 DEC 2003

Abstract: A theoretical model and experimental results to characterize the time-dependent formation of one-dimensional dark photovoltaic solitons under open-circuit conditions are presented. According to this theory, quasi-steady-state and steady-state solitons can both be obtained. In the quasi-steady-state regime solitons have intensity-independent widths, whereas their formation time is inversely proportional to the intensity, as confirmed by experimental results obtained with LiNbO₃ samples. Theory predicts that the response times of steady-state solitons will be given by the dielectric response in the absence of an illuminating field, T-d. In the samples used in this research, only a trend toward a steady-state regime was observed, because of the prohibitively high value of T-d. (C) 2003 Optical Society of America.

ISSN: 0740-3224

Record 83 of 171

Author(s): Mussot, A; Sylvestre, T; Provino, L; Maillotte, H

Title: Generation of a broadband single-mode supercontinuum in a conventional dispersion-shifted fiber by use of a subnanosecond microchip laser

Source: OPTICS LETTERS, 28 (19): 1820-1822 OCT 1 2003

Abstract: We report the experimental generation, simply by use of a subnanosecond microchip laser at 532 nm and a conventional dispersion-shifted fiber, of a supercontinuum that spans more than 1100 nm. We show by detailed spectral analysis that this supercontinuum originates from a preliminary four-wave mixing process with multimode phase matching and subsequent double-cascade stimulated Raman scattering and is transversely single mode as a result of Raman-induced mode competition. This technique is believed to be the simplest configuration that allows one to generate a stable supercontinuum. (C) 2003 Optical Society of America.

ISSN: 0146-9592

Record 84 of 171

Author(s): Provino, L; Mussot, A; Lantz, E; Sylvestre, T; Maillotte, H

Title: Broadband and flat parametric amplifiers with a multisection dispersion-tailored nonlinear fiber arrangement

Source: JOURNAL OF THE OPTICAL SOCIETY OF AMERICA B-OPTICAL PHYSICS, 20 (7): 1532-1537 JUL 2003

Abstract: We describe a simple scheme to allow for the achievement of flat gain over ultrabroad bands with a single-pump fiber-optic parametric amplifier operating in the zero-dispersion wavelength region. The proposed method, based on a multisection dispersion-tailored in-line nonlinear fiber arrangement, is demonstrated by both modulational instability theory and numerical simulations of the nonlinear Schrodinger equation. The results show that the design can be adjusted to generate gain bands that exceed either 100 nm with a ripple of less than 0.2 dB and for a pump power of only 500 mW, or even 200 nm when a pump power of 5 W is used. In addition, the robustness of this gain-flattening technique has been numerically checked against random fluctuations of the zero-dispersion wavelength in each of the fiber sections. (C) 2003 Optical Society of America.

ISSN: 0740-3224

Record 85 of 171

Author(s): Jiang, Y; Jedrkiewicz, O; Minardi, S; Di Trapani, P; Mosset, A; Lantz, E; Devaux, F

Title: Retrieval of spatial shot-noise in the full dynamic range of calibrated CCD cameras

Source: EUROPEAN PHYSICAL JOURNAL D, 22 (3): 521-526 MAR 2003

Abstract: The pixel by pixel calibration of a scientific CCD camera allows Poissonian statistics of the spatial fluctuations of an uniform. enlightening to be retrieved in the full range of the camera dynamic. The procedure works efficiently for thermal as well as for laser sources, provided that the wavelength and the coherence properties of the source are chosen in order to avoid the formation of equal thickness fringes in the chip (etaloning effect). Calibration allows also the comparison at the shot noise level of images recorded at different places on the chip.

ISSN: 1434-6060

DOI: 10.1140/epjd/e2003-00002-4

Record 86 of 171

Author(s): Couton, G; Maillotte, H; Giust, R; Chauvet, M

Title: Formation of reconfigurable singlemode channel waveguides in LiNbO3 using spatial solitons

Source: ELECTRONICS LETTERS, 39 (3): 286-287 FEB 6 2003

Abstract: Formation of reconfigurable singlemode channel waveguides using photovoltaic dark spatial solitons is demonstrated in a titanium-diffused slab LiNbO3 waveguide. The generated mode profile is shown to be influenced by the presence of titanium.

ISSN: 0013-5194

DOI: 10.1049/el:20030193

Record 87 of 171

Author(s): Attias, AJ; Cavalli, C; Lemaitre, N; Cherioux, F; Maillotte, H; Ledoux, I; Zyss, J

Title: 6,6'-distyryl-3,3'-bipyridine derivatives: a novel class of tunable chromophores for second- and third-order nonlinear optical applications

Source: JOURNAL OF OPTICS A-PURE AND APPLIED OPTICS, 4 (6): S212-S220 NOV 2002

Abstract: We report on the design, synthesis, structural characterization and quadratic as well as cubic nonlinear optical (NLO) properties of a series of organic chromophores (6, 6'-distyryl-3, 3'-bipyridine derivatives disubstituted with donor (D) and/or acceptor (A) end-groups). The compounds are either dipolar (push-pull molecules) or apolar (symmetric D-A-A-D molecules). By lateral substitutions of the pi-conjugated bridge and by varying the nature of the donor/acceptor (D/A) pair, we were able to tune both the mesogenic and NLO properties of the chromophores. Their second-order NLO properties were evaluated by the electric-field-induced second-harmonic technique. All the compounds are transparent at the second-harmonic wavelength of typical laser sources (1.32 and 1.55 μm). For the mesogenic chromophores, first hyperpolarizabilities extrapolated to infinite wavelength, $\beta(0)$ between 16 and 85×10^{-30} esu were measured. These compounds exhibit enhanced hyperpolarizabilities compared to typical NLO liquid crystal chromophores reported in the literature. Both the nonlinear refractive index $n(2)$ and the two-photon absorption (TPA) coefficient $\alpha(2)$ were simultaneously measured $\lambda = 1064$ nm, using a single-shot (50 ps, 10 Hz) multi-channel Z-scan method. For all molecular compounds, Z-scan measurements in dichloromethane solutions show a large nonlinear refractive index, close to that of pure carbon disulfide, without detectable TPA in most cases. These measurements lead to extrapolated nonresonant $n(2)$ values between 1×10^{-16} and 4×10^{-16} m^2/W , whatever the electronic structure of the compounds. Hence, apolar symmetric D-A-A-D molecules appear to be an interesting novel family of NLO dyes.

ISSN: 1464-4258

Record 88 of 171

Author(s): Monneret, S; Le Gall, H; Bade, V; Devaux, F; Mosset, A; Lantz, E

Title: Dynamic UV microstereolithography

Source: EUROPEAN PHYSICAL JOURNAL-APPLIED PHYSICS, 20 (3): 213-218 DEC 2002

Abstract: A new process of microstereolithography to manufacture freeform solid three-dimensional microcomponents with outer dimensions in the millimetre size range is presented. The process, based on the use of a liquid crystal display as a dynamic mask generator, works with conventional industrial UV-sensitive stereolithographic materials. The main innovation of the process consists in using the optical frequency up-conversion of images from the visible to the UV range in order to overcome the opacity of LCD's in the UV domain. 400 x 400 points up-converted images have been obtained to generate solid three-dimensional objects.

ISSN: 1286-0042

DOI: 10.1051/epjap:2002094

Record 89 of 171

Author(s): Lantz, E; Cambournac, C; Maillotte, H

Title: Spatiotemporal dynamics of soliton arrays generated from spatial noise in a planar waveguide with relaxing Kerr nonlinearity

Source: OPTICS EXPRESS, 10 (18): 942-948 SEP 9 2002

Abstract: Quasi-periodic arrays of bright soliton-like beams are obtained experimentally in the picosecond regime as a result of the transverse modulational instability of a noisy continuous background in a planar CS₂ waveguide. For a given propagation length, the array is stable from a laser shot to another and for a wide range of input intensities. The experimental period corresponds to the maximum gain of modulational instability only for the intensity just sufficient for soliton formation. On the other hand the mean period increases with the propagation length. We show by a numerical simulation that the leading edge of the pulse governs the dynamical formation of the array owing to the finite relaxation time of the reorientational Kerr nonlinearity in CS₂.

(C) 2002 Optical Society of America.

ISSN: 1094-4087

Record 90 of 171

Author(s): Cambournac, C; Sylvestre, T; Maillotte, H; Vanderlinden, B; Kockaert, P; Emplit, P; Haelterman, M

Title: Symmetry-breaking instability of multimode vector solitons

Source: PHYSICAL REVIEW LETTERS, 89 (8): Art. No. 083901 AUG 19 2002

Abstract: We show experimentally that the two-component multimode spatial optical vector soliton, i.e., a two-hump self-guided laser beam, exhibits in Kerr media a sharp space-inversion symmetry-breaking instability. The experiment is performed in a CS₂ planar waveguide using the orthogonal circular polarization states of light as the two components of the vector soliton.

ISSN: 0031-9007

Article Number: 083901

DOI: 10.1103/PhysRevLett.89.083901

Record 91 of 171

Author(s): Mountasser, R; Ayadi, M; Lantz, E; Maillotte, H

Title: Transmission through a nonlinear thin layer near the critical angle of incidence: application to the sensitive determination of the nonlinear refractive index

Source: JOURNAL OF OPTICS A-PURE AND APPLIED OPTICS, 4 (3): 303-308 MAY 2002

Abstract: Optical transmission, near the critical angle of incidence, through a nonlinear thin layer sandwiched between two linear glass blocks is studied. The transmissivity of the layer in the near-resonant regime is very sensitive to the intensity-induced change of its refractive index. Using this property, we propose a method to determine the nonlinear refractive index $n^{(2)}$ of thin films, on the basis of a simple plane-wave model. Experimental results in the picosecond range, using CS₂ standard as the nonlinear layer, show the high sensitivity of the method.

ISSN: 1464-4258

Record 92 of 171

Author(s): Burger, S; Cherioux, F; Monnier-Jobe, K; Laude, B; Maillotte, H

Title: 2-pyridones as a new photochemically stable structural design for the off-resonant optical Kerr effect

Source: ADVANCED FUNCTIONAL MATERIALS, 12 (5): 339-346 MAY 2002

Abstract: We report on the development of new 2-pyridones as an efficient means to avoid the photochemical instability often encountered in organic third-order nonlinear optical materials. Several push-pull molecules with this particular non-aromatic heterocycle as a spacer between different donor and acceptor groups have been easily synthesized. The good transmitter behavior of the pyridonic ring is demonstrated and picosecond infrared single-shot Z-scan measurements performed in solution show the

ability of these molecules to exhibit a stable and off-resonant optical Kerr effect. A polymer based on this structural design has also been developed.

ISSN: 1616-301X

Record 93 of 171

Author(s): Sylvestre, T; Coen, S; Emplit, P; Haelterman, M

Title: Self-induced modulational instability laser revisited: normal dispersion and dark-pulse train generation

Source: OPTICS LETTERS, 27 (7): 482-484 APR 1 2002

Abstract: We study theoretically and experimentally the so-called self-induced modulational instability laser and show that the passive mode-locking mechanism that is at play in this laser relies on a dissipative four-wave mixing process that leads to generation of a dark-pulse train in the normal-dispersion regime. (C) 2002 Optical Society of America.

ISSN: 0146-9592

Record 94 of 171

Author(s): Cherioux, F; Attias, AJ; Maillotte, H

Title: Symmetric and asymmetric conjugated 3,3'-bipyridine derivatives as a new class of third-order NLO chromophores with an enhanced non-resonant, nonlinear refractive index in the picosecond range

Source: ADVANCED FUNCTIONAL MATERIALS, 12 (3): 203-208 MAR 2002

Abstract: We report on the synthesis and third-order nonlinear optical (NLO) properties of new asymmetric (push-pull) and symmetric chromophores based on the 3,3'-bipyridine core. The nonlinear refraction as well as the linear and nonlinear absorption of these compounds has been studied. In solution, by spectroscopy and picosecond single-shot Z-scan measurements. The results are very promising, in terms of non-resonant, nonlinear refractive index in the near infrared, particularly with enhancement of the (nonlinear efficiency/transparency) trade-off afforded by the symmetrization of the chromophores. A new polymer with this structural design has also been investigated.

ISSN: 1616-301X

Record 95 of 171

Author(s): Cambournac, C; Maillotte, H; Lantz, E; Dudley, JM; Chauvet, M

Title: Spatiotemporal behavior of periodic arrays of spatial solitons in a planar waveguide with relaxing Kerr nonlinearity

Source: JOURNAL OF THE OPTICAL SOCIETY OF AMERICA B-OPTICAL PHYSICS, 19 (3): 574-585 MAR 2002

Abstract: We report picosecond pulsed experiments and numerical simulations of spatially induced modulational instability, which we used to form stable periodic arrays of bright soliton beams in a planar Kerr-like CS₂ waveguide. We have found that the generation stage of these arrays is accurately described by the usual nonlinear Schrodinger wave equation, whereas the temporal dynamics of the nonlinearity is beneficial for subsequent stable propagation of the soliton arrays. In the picosecond regime the finite molecular relaxation time of the reorientational nonlinear index inhibits the Fermi-Pasta-Ulam recurrence predicted for an instantaneous Kerr nonlinearity. Moreover, the inhibition is associated with a novel spatiotemporal dynamics confirmed by numeric and streak-camera recordings. (C) 2002 Optical Society of America.

ISSN: 0740-3224

Record 96 of 171

Author(s): Lantz, E; Devaux, F

Title: Numerical simulation of spatial fluctuations in parametric image amplification

Source: EUROPEAN PHYSICAL JOURNAL D, 17 (1): 93-98 OCT 2001

Abstract: We study the properties of the spatial fluctuations in the far-field parametric fluorescence output of a type I degenerate traveling-wave parametric amplifier. Results of a semi-classical simulation are compared with experiments in a LBO crystal. This simulation is then used to predict amplified images of a continuous background, in a phase-sensitive as well as in a phase-insensitive configuration.

ISSN: 1434-6060

Record 97 of 171

Author(s): Devaux, F; Mosset, A; Lantz, E; Monneret, S; Le Gall, H

Title: Image upconversion from the visible to the UV domain: application to dynamic UV microstereolithography

Source: APPLIED OPTICS, 40 (28): 4953-4957 OCT 1 2001

Abstract: We present what to our knowledge is a new application of optical frequency upconversion of images in quadratic materials to dynamic UV microstereolithography. A 150 x 150 point visible image transmitted by a liquid-crystal display was upconverted in a lithium triborate crystal, and the UV image was successfully used to polymerize a commercial stereolithographic resin. (C) 2001 Optical Society of America.

ISSN: 0003-6935

Record 98 of 171

Author(s): Chauvet, M; Chauvin, S; Maillotte, H

Title: Transient dark photovoltaic spatial solitons and induced guiding in slab LiNbO₃ waveguides

Source: OPTICS LETTERS, 26 (17): 1344-1346 SEP 1 2001

Abstract: Dark photorefractive photovoltaic spatial solitons are demonstrated at 532 nm in nominally undoped and slightly Fe-doped LiNbO₃ planar optical waveguides. The spatial solitons are observed in a transient regime before transverse modulation instability occurs. Their widths are intensity independent as predicted by theory. Meanwhile, excited mode distribution and Fe-doping concentration are shown to influence soliton width. The guiding properties of soliton-induced waveguides are also presented. (C) 2001 Optical Society of America.

ISSN: 0146-9592

Record 99 of 171

Author(s): Fanjoux, G; Billault, HF; Lescop, B; Le Nadan, A

Title: Evolution of the magnesium surface during oxidation studied by Metastable Impact Electron Spectroscopy

Source: JOURNAL OF ELECTRON SPECTROSCOPY AND RELATED PHENOMENA, 119 (1): 57-67 JUL 2001

Abstract: The evolution of a polycrystalline magnesium surface during oxidation at room temperature has been studied by Metastable Impact Electron Spectroscopy (MIES). This technique allowed us to follow the metal-to-insulator transformation of the top layer of the surface. An electronic signal corresponding to a metallic behavior of the surface evidences the presence of under-stoichiometric MgO species on the surface. The total covering by oxygen of the Mg surface uppermost layer, obtained at around 10 L of oxygen deposition, does not correspond to a fully insulating surface. An insulating surface is obtained after 30 L of oxygen deposition. Depositions of CO₂ on a clean and a preoxidized polycrystalline Mg surface have been analyzed to give information about the composition of the surface and its evolution. CO₂ adsorption in the form of CO₃²⁻ compounds on preoxidized Mg is more efficient than on clean Mg. Oxygen species, corresponding to chemisorbed oxygen less bounded than oxygen in the MgO lattice, allows the formation of CO₃²⁻. Therefore, it is concluded that during oxygen deposition at room temperature, MgO islands and chemisorbed oxygen species coexist on the surface. Moreover, the larger the oxygen predeposition is, the less CO₃²⁻ compounds are formed, meaning a decrease of available chemisorbed oxygen sites. From oxidation measurements at high temperature (420 K), we show that MgO islands and uncovered Mg domain coexist. Further, no under-stoichiometric compound features have been observed. The high temperature allows the direct formation of oxide MgO species in islands. (C) 2001 Elsevier Science B.V. All rights reserved.

ISSN: 0368-2048

Record 100 of 171

Author(s): Sylvestre, T; Coen, S; Deparis, O; Emplit, P; Haelterman, M

Title: Demonstration of passive modelocking through dissipative four-wave mixing in fibre laser

Source: ELECTRONICS LETTERS, 37 (14): 881-882 JUL 5 2001

Abstract: Experimental observation of passive modelocking by dissipative four-wave mixing in an erbium-doped Fibre laser containing a dual-peak fibre Bragg-grating filter is reported. The laser operates in the normal dispersion regime and generates optical dark pulse trains with a repetition rate of 80 GHz.

ISSN: 0013-5194

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Page 2 (Articles 101 -- 171)[Print This Page](#)[◀ \[1 | 2 \] ▶](#)**Record 101 of 171****Author(s):** Dinda, PT; Seve, E; Millot, G; Sylvestre, T; Maillotte, H; Lantz, E**Title:** Raman-assisted three-wave mixing of non-phase-matched waves in optical fibres: application to wide-range frequency conversion**Source:** OPTICS COMMUNICATIONS, 192 (1-2): 107-121 MAY 15 2001

Abstract: We analyse theoretically and experimentally the Raman-assisted parametric coupling between non-phase-matched waves propagating in normally dispersive single-mode fibres. We perform a careful analysis of the wave-coupling behaviour, which shows that scalar and vector three-wave mixing (TWM) interactions induce a relatively small periodic power flow between a central-frequency pump at frequency ω and a pair of up-shifted (anti-Stokes) and down-shifted (Stokes) sidebands at frequencies $\omega(0) + \Omega$ and $\omega(0) - \Omega$, respectively. For sufficiently high pump powers, the stimulated Raman scattering enters into play, causing a unilateral transfer of energy from higher to lower frequency waves. This energy transfer destroys the spatial periodicity of the parametric energy-exchange process. As a result, parametric seeding and subsequent Raman amplification of a Stokes idler wave is achieved by mixing a strong pump with a weak anti-Stokes signal. This Raman-induced Stokes power-gain enhancement leads to efficient anti-Stokes - Stokes frequency conversion, with frequency detunings which can be relatively large (typically, from 7 to 30 THz), even for very short parametric coherence. Raman-assisted TWM thus overcomes the strict spectral limitation usually imposed by the phase-matching condition, leading to broadband frequency conversion processes that are inaccessible with a pure parametric interaction. (C) 2001 Elsevier Science S.V. All rights reserved.

ISSN: 0030-4018**Record 102 of 171****Author(s):** Sylvestre, T; Maillotte, H; Lantz, E; Devaux, F**Title:** Pump-power-dependent gain for small-signal parametric amplification in birefringent fibres**Source:** OPTICS COMMUNICATIONS, 191 (3-6): 245-251 MAY 8 2001

Abstract: The nonlinear dependence of the parametric gain for small-signal amplification is experimentally studied in a normally dispersive highly birefringent single-mode fibre. As a result of the pump-induced nonlinear phase shift, the signal gain curve versus the pump power is bell shaped in the undepleted-pump regime with maximum gain attained away from perfect phase-matching. This dynamics is quite different from the quasi-exponential gain measured for spontaneous parametric emission growing from noise. Moreover, the experimental gain curves are more accurately predicted by modulation instability computations rather than four-wave mixing theory because of the influence of the non-phase-matched waves. (C) 2001 Published by Elsevier Science B.V.

ISSN: 0030-4018**Record 103 of 171****Author(s):** Provino, L; Dudley, JM; Maillotte, H; Grossard, N; Windeler, RS; Eggleton, BJ**Title:** Compact broadband continuum source based on microchip laser pumped microstructured fibre**Source:** ELECTRONICS LETTERS, 37 (9): 558-560 APR 26 2001

Abstract: A 300nm broadband visible continuum has been generated in a 1.8m length of microstructured fibre pumped at 532nm by 0.8ns pulses from a frequency-doubled passively Q-switched Nd:YAG microchip laser. With nanosecond pulses, self-phase-modulation is negligible, and the continuum generation is dominated by the interplay of Raman and parametric effects.

ISSN: 0013-5194**Record 104 of 171****Author(s):** Sylvestre, T; Dinda, PT; Maillotte, H; Lantz, E; Moubissi, AB; Pitois, S**Title:** Wavelength conversion from 1.3 μm to 1.5 μm in single-mode optical fibres using Raman-assisted three-wave mixing**Source:** JOURNAL OF OPTICS A-PURE AND APPLIED OPTICS, 2 (2): 132-141 MAR 2000

Abstract: We theoretically analyse the achievement of wide-range all-optical wavelength conversion of a 1.31 μm signal to an idler wave in the 1.5 μm spectral region by Raman-assisted three-wave mixing in single-mode optical fibres. Raman-assisted three-wave mixing allows efficient conversion on a large frequency detuning bandwidth while alleviating the need for stringent phase-matching conditions.

ISSN: 1464-4258**Record 105 of 171****Author(s):** Lantz, E; Devaux, F

Title: The phase-mismatch vector and resolution in image parametric amplification

Source: JOURNAL OF OPTICS A-PURE AND APPLIED OPTICS, 2 (5): 362-364 SEP 2000

Abstract: We derive up to second order the magnitude and direction of the phase-mismatch vector in parametric image amplification. This general analytical calculation is shown to be in agreement with our previous numerical studies of the image resolution at degeneracy.

ISSN: 1464-4258

Record 106 of 171

Author(s): Poilane, C; Lantz, E; Tribillon, G; Delobelle, P

Title: Measurement of in-plane displacement fields by a spectral phase algorithm applied to numerical speckle photography for microtensile tests

Source: EUROPEAN PHYSICAL JOURNAL-APPLIED PHYSICS, 11 (2): 131-145 AUG 2000

Abstract: This paper describes a numerical method applied to speckle photography to measure the inplane displacement field on a thin film and specially adapted to microtensile test. Speckle photography is chosen to avoid touching and stressing the specimen. A Spectral Phase Algorithm particularly useful in the case of small displacement or/and strain is compared with the Intercorrelation and Double FFT methods. A final algorithm using first the Intercorrelation method without interpolation and secondly the Spectral Phase Algorithm is then adopted to estimate with good accuracy the in-plane displacement field in quasi-real time during the microtensile tests.

A first application of the method to the tensile tests performed on thin films of electroplated copper of 18, 35 and 70 μm of thickness is then presented.

ISSN: 1286-0042

Record 107 of 171

Author(s): Devaux, F; Lantz, E

Title: Gain in phase sensitive parametric image amplification

Source: PHYSICAL REVIEW LETTERS, 85 (11): 2308-2311 SEP 11 2000

Abstract: We report an experiment of type 2 parametric image amplification in a phase sensitive configuration. In the spatial frequency domain, the parametric gain corresponds to amplification or deamplification, depending on the relative phase of the input image with respect to the pump wave and on the spatial frequencies of the input image.

ISSN: 0031-9007

Record 108 of 171

Author(s): Cherioux, F; Maillotte, H; Dudley, JM; Audebert, P

Title: Enhancement of non-resonant non-linear refractive index with reduction of absorption in push-pull molecules by reduction of their donor group strength

Source: CHEMICAL PHYSICS LETTERS, 319 (5-6): 669-673 MAR 24 2000

Abstract: We show that reducing the strength of the amine donor group in push-pull molecules increases their non-resonant non-linear refractive index in the infrared although the blue-shift of their visible absorption peak, associated with the donor strength reduction, can decrease their linear and non-linear absorption at the excitation wavelength. This effect is explained phenomenologically using a two-level model, and we present experimental results in good agreement with semi-empirical calculations. (C) 2000 Elsevier Science B.V. All rights reserved.

ISSN: 0009-2614

Record 109 of 171

Author(s): Devaux, F; Lantz, E

Title: Spatial and temporal properties of parametric fluorescence around degeneracy in a type I LBO crystal

Source: EUROPEAN PHYSICAL JOURNAL D, 8 (1): 117-124 JAN 2000

Abstract: We present a theoretical and experimental study of the spatio-temporal properties of the spontaneous parametric emission generated in a type I LBO crystal around degeneracy. The number of quasi-phase-matched modes is shown to be equal to the number of spatio-temporal degrees of freedom of the image that can be parametrically amplified. From this number, we demonstrate the possibility of predicting the total number of photons generated by parametric fluorescence. Correlation is observed between spatial intensity fluctuations corresponding to pairs of signal-idler modes.

ISSN: 1434-6060

Record 110 of 171

Author(s): Sylvestre, T; Maillotte, H; Lantz, E; Dinda, PT

Title: Raman-assisted parametric frequency conversion in a normally dispersive single-mode fiber

Source: OPTICS LETTERS, 24 (22): 1561-1563 NOV 15 1999

Abstract: We demonstrate efficient frequency conversion with large frequency shifts of an anti-Stokes signal into a parametrically seeded Stokes idler, which is generated by a highly mismatched three-wave mixing interaction and subsequent Raman amplification in a normally dispersive single-mode fiber. The use of non-phase-matched waves in Raman-assisted three-wave mixing interactions overcomes the strict spectral limitations imposed by phase-matching conditions in parametric frequency-conversion processes. (C) 1999 Optical Society of America.

ISSN: 0146-9592

Record 111 of 171

Author(s): Seve, E; Millot, G; Wabnitz, S; Sylvestre, T; Maillotte, H

Title: Generation of vector dark-soliton trains by induced modulational instability in a highly birefringent fiber

Source: JOURNAL OF THE OPTICAL SOCIETY OF AMERICA B-OPTICAL PHYSICS, 16 (10): 1642-1650 OCT 1999

Abstract: We present a set of experimental observations that demonstrate the generation of vector trains of dark-soliton pulses in the orthogonal axes of a highly birefringent optical fiber. We generated dark-soliton trains with terahertz repetition rate in the normal group-velocity dispersion regime by inducing a polarization modulational instability by mixing two intense, orthogonal continuous laser beams. Numerical solutions of the propagation equations were used to optimize the emission of vector dark pulses at the fiber output. (C) 1999 Optical Society of America [S0740-3224(99)02110-4].

ISSN: 0740-3224

Record 112 of 171

Author(s): Cherioux, F; Maillotte, H; Audebert, P; Zyss, J

Title: Synthesis and characterisation of an octupolar polymer and new molecular octupoles with off-resonant third order optical nonlinearities

Source: CHEMICAL COMMUNICATIONS, (20): 2083-2084 OCT 21 1999

Abstract: The first synthesis and Z-scan measurements of an octupolar polymer with off-resonant third order nonlinear optical properties are discussed; two other new molecular thiophene-based octupoles with similar nonlinearities are also reported.

ISSN: 1359-7345

Record 113 of 171

Author(s): Le Tolguenec, G; Devaux, F; Lantz, E

Title: Two-dimensional time-resolved direct imaging through thick biological tissues: a new step toward noninvasive medical imaging

Source: OPTICS LETTERS, 24 (15): 1047-1049 AUG 1 1999

Abstract: We report an original two-dimensional time-resolved direct imaging method for transillumination optical tomography that combines the time-gating and forward phase-conjugation properties of type II degenerate parametric amplification. An object with subcentimeter resolution embedded in C-cm-thick chicken breast tissue was imaged with a signal-to-noise ratio of 2. (C) 1999 Optical Society of America.

ISSN: 0146-9592

Record 114 of 171

Author(s): Dinda, PT; Wabnitz, S; Coquet, E; Sylvestre, T; Maillotte, H; Lantz, E

Title: Demonstration of stimulated-Raman-scattering suppression in optical fibers in a multifrequency pumping configuration

Source: JOURNAL OF THE OPTICAL SOCIETY OF AMERICA B-OPTICAL PHYSICS, 16 (5): 757-767 MAY 1999

Abstract: We analyze the stimulated-Raman-scattering-(SRS) process induced by a linearly polarized multifrequency pump field in a normally dispersive single-mode fiber. We show, by theoretical analysis and numerical simulations, that the SRS process may be either controlled by switching all the generated Stokes radiations to the lowest-frequency pump or suppressed for all the frequency components of the pump field. The suppression process is achieved by an appropriate choice of the frequency separation between the pumps and a particular power distribution among the frequency components of the pump field. We present experimental spectra showing the effectiveness of this suppression process for a dual-frequency pumping configuration. (C) 1999 Optical Society of America [S0740-3224(99)01704-X].

ISSN: 0740-3224

Record 115 of 171

Author(s): Vernotte, F; Zalamansky, G; Lantz, E

Title: Time stability characterization and spectral aliasing - Part I: a time-domain approach

Source: METROLOGIA, 35 (5): 723-730 1998

Abstract: The noise levels given by spectral analysis are relevant parameters for the characterization of the time-domain stability of oscillators. The estimation of the noise levels of a sampled signal may be achieved with variances even if the sampling frequency is far lower than the high cut-off frequency. The effects of spectral aliasing for the white-phase noise are shown and a procedure for estimating both white-phase noise level and high cut-off frequency is given in this paper.

ISSN: 0026-1394

Record 116 of 171

Author(s): Vernotte, F; Zalamansky, G; Lantz, E

Title: Time stability characterization and spectral aliasing - Part II: a frequency-domain approach

Source: METROLOGIA, 35 (5): 731-738 1998

Abstract: We showed in Part I of this paper [1] that the estimation of the white-phase noise level of a sampled signal may be achieved with variances even if the sampling frequency is far lower than the high cut-off frequency. In Part II, the effects of spectral aliasing for the different types of noise are reviewed. The responses of the Allan variance and the modified Allan variance for high-frequency noises are calculated taking into account the spectral aliasing. It is demonstrated that the effects of spectral aliasing for low-frequency noises may be neglected.

ISSN: 0026-1394

Record 117 of 171

Author(s): Lescop, B; Ben Arfa, M; Cherid, M; Fanjoux, G; Kassab, E

Title: Penning ionization electron spectroscopy of N-2 with Ne*(P-3(0.2))

Source: JOURNAL DE CHIMIE PHYSIQUE ET DE PHYSICO-CHIMIE BIOLOGIQUE, 95 (10): 2113-2128 NOV-DEC 1998

Abstract: We have studied the Penning ionization electron spectroscopy of the N-2 molecule with Ne*((3)P0,2) metastable atoms. We have estimated the well depth of the entrance channel potential curve around 2 meV. Moreover we have observed a non Franck-Condon vibrational population of the N-2(+) X(2)Sigma(g)(+) electronic state. This result is explained with a resonant excitation transfer between the colliding particles leading the target in an excited state belonging to the Rydberg series that converge to N-2(+) A(2)Pi(u). Autoionization of this intermediate state accounts for the population of the higher vibrational levels v' greater than or equal to 1 of the N-2(+) X(2)Sigma(g)(+) residual ion.

ISSN: 0021-7689

Record 118 of 171

Author(s): Sylvestre, T; Maillotte, H; Dinda, PT; Coquet, E

Title: Suppression of stimulated Raman scattering in optical fibres by power-controlled multifrequency pumping

Source: OPTICS COMMUNICATIONS, 159 (1-3): 32-36 JAN 1 1999

Abstract: We present a method for suppressing the stimulated Raman scattering process induced by a multifrequency pump field propagating in a normally dispersive single-mode fibre. The suppression process is completely achieved by suitably choosing the frequency separation between the pumps, as well as the power distribution among the frequency components of the pump field. The experimental spectra show the effectiveness of this suppression process for a dual-frequency pumping configuration. (C) 1999 Published by Elsevier Science B.V. All rights reserved.

ISSN: 0030-4018

Record 119 of 171

Author(s): Ben Arfa, M; Lescop, B; Cherid, M; Fanjoux, G

Title: Penning ionization of the CO2 molecule by He*(2(1)S) metastable atoms

Source: JOURNAL OF PHYSICS B-ATOMIC MOLECULAR AND OPTICAL PHYSICS, 31 (21): 4813-4820 NOV 14 1998

Abstract: This paper deals with an electron spectroscopy study of the Penning ionization of the CO2 molecule by helium atoms excited in the singlet metastable 2(1)S state. The X, A, B and C electronic states of the CO2+ ion were identified in the electron energy spectrum obtained. A negative energy shift was measured for all these states. The ratio between the ionization cross sections of A and B electronic states was also measured. These A and B states were respectively favoured in the orthogonal and collinear approaches. Our results showed that, when the system switched from the orthogonal to the collinear direction, the attractive character of the He*CO2 system was increased and the Penning ionization cross section became larger. One can explain these observations by the s-p hybridization of the helium 2s orbital occurring during the approach of the CO2 target.

ISSN: 0953-4075

Record 120 of 171

Author(s): Devaux, F; Guiot, E; Lantz, E

Title: Image restoration through aberrant media by optical phase conjugation in a type II three-wave mixing interaction

Source: OPTICS LETTERS, 23 (20): 1597-1599 OCT 15 1998

Abstract: Restoration of an image through an aberrant plate has been achieved by use of optical phase conjugation in a type II parametric interaction in which the amplified signal and idler waves are reflected back through the aberrant medium. The resolution of the restored phase-conjugate images is equal to 0.18 mm, and the amplification gain is similar to 4 dB. (C) 1998 Optical Society of America.

ISSN: 0146-9592

Record 121 of 171

Author(s): Sylvestre, T; Maillotte, H; Lantz, E

Title: Stimulated Raman suppression under dual-frequency pumping in singlemode fibres

Source: ELECTRONICS LETTERS, 34 (14): 1417-1418 JUL 9 1998

Abstract: Suppression of stimulated Raman scattering is demonstrated in a singlemode fibre by single polarised, dual-frequency pumping. The suppression mechanism, based on the spectral asymmetry of the Raman susceptibility, is most efficient when the frequency spacing between the pumps is 26THz, twice the Raman shift.

ISSN: 0013-5194

Record 122 of 171

Author(s): Hernandez, FE; Marcano, A; Alvarado, Y; Biondi, A; Maillotte, H

Title: Measurement of nonlinear refraction index and two-photon absorption in a novel organometallic compound

Source: OPTICS COMMUNICATIONS, 152 (1-3): 77-82 JUN 15 1998

Abstract: We have determined the nonlinear refraction index [$n(2) = -(6.6 \pm 0.7) \times 10^{-11} \text{ cm}^2/\text{W}$] and two-photon absorption (TPA) coefficients [$\beta = (4.5 \pm 0.4) \times 10^{-8} \text{ cm/W}$] of a new kind of organometallic compound [$\text{Tp}^* \text{Ir}(\text{CHCHC}(\text{CH}_3)(\text{NH})(\text{C}_2\text{H}_5))$] in dilute CH_2Cl_2 ($1 \times 10^{-3} \text{ M}$) solution. The experiments were performed with a nanosecond-pulsed Nd-YAG laser at its second harmonic ($\lambda = 532 \text{ nm}$) radiation and employing the single- and dual-beam Z-scan techniques. The beam polarization, wavelength dependence and fast response time ($\tau < 7 \text{ ns}$) of the effect indicate that the observed nonlinearity near resonance is of electronic origin. This material also shows a good figure of merit [$(2\beta \lambda)/n(2) = 0.07$] for its applications in all-optical devices in the nanosecond regime. Additionally, this organometallic is easy to synthesize, stable and exhibits no toxic and no pollutant properties. (C) 1998 Published by Elsevier Science B.V. All rights reserved.

ISSN: 0030-4018

Record 123 of 171

Author(s): Chauvet, M; Salamo, GJ; Bliss, DF; Bryant, G

Title: Evaluation of InP : Fe parameters by measurement of two wave mixing photorefractive and absorptive gain

Source: JOURNAL OF ELECTRONIC MATERIALS, 27 (7): 883-890 JUL 1998

Abstract: In this paper, we present two-wave mixing absorption gain measurements in InP:Fe in the 960-1035 nm wavelength range. The measured absorption gain is shown to be positive for long wavelength but changes sign for shorter wavelength. By simultaneously measuring the photorefractive gain and the absorption gain, we deduce the values of the photo-ionization cross sections related to the iron deep level trap. Finally, the study of the temperature dependence of the absorption gain allows us to evaluate a temperature shift of the iron level with respect to the conduction band of $-4 \times 10^{-4} \text{ eV/K}$.

ISSN: 0361-5235

Record 124 of 171

Author(s): Oriat, L; Lantz, E

Title: Subpixel detection of the center of an object using a spectral phase algorithm on the image

Source: PATTERN RECOGNITION, 31 (6): 761-771 JUN 1998

Abstract: This paper presents an algorithm designed for detecting the center of an object with central symmetry in an image. It is well known that the spectral phase of such an object is a plane whose orientation depends on the object position in the image. Our algorithm applies weighting of the moduli to determine the slope and the orientation of this wrapped phase plane in the image spectrum. A comparison is made with other conventional methods and shows the advantages of this algorithm: subpixel resolution, computing speed, ease of implementation. (C) 1998 Pattern Recognition Society. Published by Elsevier Science Ltd. All rights reserved.

ISSN: 0031-3203

Record 125 of 171

Author(s): Fanjoux, G; Lavorel, B; Millot, G

Title: Collisional shifting and broadening coefficients for the rovibrational anisotropic lines of the $\nu(1)/2\nu(2)$ Fermi dyad in CO₂ gas studied by stimulated Raman spectroscopy

Source: JOURNAL OF RAMAN SPECTROSCOPY, 29 (5): 391-397 MAY 1998

Abstract: High-resolution stimulated Raman spectroscopy was applied to the study of collisional broadening and shifting for rovibrational anisotropic Raman Lines of the Fermi dyad of molecular carbon dioxide. The O(J) lines of the $\nu(1)$ band and the S(J) lines of the $2\nu(2)$ band were recorded at 295 K. The pressure-induced line shifts were obtained and compared with the overall shift of the high-density Raman Q-branch. A rotational quantum number dependence of the rovibrational line broadening coefficients was observed. The experimental line broadening coefficients were used in order to check the ability of two theoretical methods (random phase approximation and sum rule) for calculating the line broadening coefficients in anisotropic Raman scattering. (C) 1998 John Wiley & Sons, Ltd.

ISSN: 0377-0486

Record 126 of 171

Author(s): Devaux, F; le Tolguenec, G; Lantz, E

Title: Phase conjugate imaging by type II parametric amplification

Source: OPTICS COMMUNICATIONS, 147 (4-6): 309-312 FEB 15 1998

Abstract: A method of imaging by optical phase conjugation using a three-wave degenerate parametric interaction is presented. The resolution in the phase conjugate image is about 90 μm and the image is amplified with a mean gain of 30 dB. (C) 1998 Elsevier Science B.V.

ISSN: 0030-4018

Record 127 of 171

Author(s): Cherioux, F; Audebert, P; Maillotte, H; Grossard, L; Hernandez, FE; Lacourt, A

Title: New third-order nonlinear polymers functionalized with Disperse Red and Disperse Orange chromophores with increased stability

Source: CHEMISTRY OF MATERIALS, 9 (12): 2921-2927 DEC 1997

Abstract: New and very stable polymers with good optical third-order nonlinearities have been prepared by condensation between a copolymer of maleic anhydride and octadecene and appropriate Disperse Red and Disperse Orange type chromophores. The nonlinear response of low concentration solutions of the polymers has been determined using a new numerical Z-scan technique. The polymers have been found highly stable, and their nonlinear response is very reproducible, both under intense illumination and upon several repeated experiments over months. Especially the polymer where the Disperse Orange 3 chromophore is incorporated in the main chain through imide linkages displays both the highest refractive nonlinearity and almost no two-photon absorption. Its surprisingly higher nonlinear response with respect to the parent Disperse Orange 3 is demonstrated and discussed.

ISSN: 0897-4756

Record 128 of 171

Author(s): Lescop, B; Ben Arfa, M; Cherid, M; Le Coz, G; Sinou, G; Fanjoux, G; Le Nadan, A; Tuffin, F

Title: Penning ionization of the CO₂ molecule by Ne* (3 P-3(2,0)) metastable atom

Source: JOURNAL OF CHEMICAL PHYSICS, 108 (2): 550-555 JAN 8 1998

Abstract: Penning ionization of the CO₂ molecule by Ne* (3 P-3(2,0)) metastable atoms is studied by electron spectroscopy. The recorded electron energy spectrum is dominated by an important vibrational progression that is decomposed over the $n\nu(1)$ and $n\nu(1)+2\nu(3)$ vibrational series up to $n=5$. In addition, we observe a low-energy broad hump extending from 0.5 to 1.5 eV. The presence of this new feature is attributed to a non-van der Waals interaction between the colliding particles. Making the hypothesis that an ion-pair state channel opens during the collision, we are in a position to interpret the entire set of experimental results. We believe that the opening of this channel is responsible for the production of the CO₂ molecule in an autoionized Tanaka-Ogawa Rydberg state. (C) 1998 American Institute of Physics.

ISSN: 0021-9606

Record 129 of 171

Author(s): Sylvestre, T; Maillotte, H; Lantz, E; Gindre, D

Title: Combined spectral effects of pulse walk-off and degenerate cross-phase modulation in birefringent fibers

Source: JOURNAL OF NONLINEAR OPTICAL PHYSICS & MATERIALS, 6 (3): 313-320 SEP 1997

Abstract: When a single ultrashort light pulse propagates through a birefringent optical fiber, degenerate cross-phase modulation occurs between the two orthogonal linearly polarized components of the pulse. The combined effects of pulse walk-off and degenerate-cross-phase modulation are characterized theoretically and experimentally. They cause asymmetry and decrease of the induced spectral broadening in comparison with pure self-phase modulation.

ISSN: 0218-1991

Record 130 of 171

Author(s): Lescop, B; BenArfa, M; Cherid, M; LeCoz, G; Sinou, G; Fanjoux, G; LeNadan, A; Tuffin, F

Title: Penning ionization electron spectroscopy of the C₂H₂ molecule by Ne* (3(3)P(2), 3(3)P(0)) metastable atoms

Source: JOURNAL OF ELECTRON SPECTROSCOPY AND RELATED PHENOMENA, 87 (1): 51-59 OCT 1997

Abstract: The present paper deals with Penning ionization electron spectroscopy (PIES) of C₂H₂ by Ne* (3 P-3(0) and 3(3)P(2)) atoms. The observed vibrational population of the X (2) Pi(u) (C₂H₂⁺) state is in agreement with the Franck-Condon factors. The measured angular distribution of ejected electrons is found to be isotropic. This behaviour is consistent with the existence of a process competing with the covalent channel. This is also in agreement with results published on the measurement of ionization cross-section as a function of collision energy. An excitation transfer process was put forward to explain the entire experimental results obtained for the Ne*-C₂H₂ system. An indirect process via Rydberg states converging to the A(2) Sigma(g)(+) state leads to a vibrational population that is not of the Franck-Condon type. However, an excitation transfer via the (2 sigma(u)(-1) --> 1 pi(g)(1)) pi* shape resonance can explain the Franck-Condon vibrational population, the large absolute value and the flattened behaviour of the ionization cross-section with respect to the variation of both collision energy and detection angle. (C) 1997 Elsevier Science B.V.

ISSN: 0368-2048

Record 131 of 171

Author(s): Lescop, B; BenArfa, M; LeCoz, G; Cherid, M; Sinou, G; Fanjoux, G; LeNadan, A; Tuffin, F

Title: Excitation transfer process in penning ionization of the CO molecule by helium atoms in singlet metastable state

Source: JOURNAL DE PHYSIQUE II, 7 (11): 1543-1554 NOV 1997

Abstract: Penning ionization electron spectroscopy of the CO molecule by He*(2(1)S) metastable atoms is studied. Vibrational populations are reported for the three energetically accessible states of the CO⁺ ion (X-2 Sigma(+), A(2) Pi and B-2 Sigma(+)). An obvious discrepancy is observed between the excited vibrational levels of the X-2 Sigma(+) state and the calculated Franck-Condon factors. This result is attributed to an excitation transfer process via Rydberg vibrational progression converging to the CO⁺ (D-2 Pi) ionic state in agreement with the recent observations by fluorescence of neutral dissociate states. The presence of electrons coming from the well-known a shape resonance is not excluded.

ISSN: 1155-4312

Record 132 of 171

Author(s): LeTolguenec, G; Devaux, F; Lantz, E

Title: Imaging through thick biological tissues by parametric image amplification and phase conjugation

Source: JOURNAL OF OPTICS-NOUVELLE REVUE D OPTIQUE, 28 (5): 214-217 OCT 1997

Abstract: Imaging through biological tissues has been performed by optical phase conjugation in a three-wave degenerate parametric interaction. A resolution of 3 mm has been obtained through 9 mm of ham.

ISSN: 0150-536X

Record 133 of 171

Author(s): LeTolguenec, G; Lantz, E; Devaux, F

Title: Imaging through scattering media by parametric amplification of images: Study of the resolution and the signal-to-noise ratio

Source: APPLIED OPTICS, 36 (31): 8292-8297 NOV 1 1997

Abstract: An imaging scheme through scattering media in which parametric image amplification is used is presented. An image of a resolution chart through a solution of latex microspheres with an attenuation of 22 mean free paths is obtained with a resolution of 20 mu m. The evolution of the signal-to-noise ratio with respect to the medium attenuation is studied and compared with a rough modeling of the imaging process. (C) 1997 Optical Society of America.

ISSN: 0003-6935

Record 134 of 171

Author(s): Chauvet, M; Hawkins, SA; Salamo, GJ; Segev, M; Bliss, DF; Bryant, G

Title: Self-trapping of two-dimensional optical beams and light-induced waveguiding in photorefractive InP at telecommunication wavelengths

Source: APPLIED PHYSICS LETTERS, 70 (19): 2499-2501 MAY 12 1997

Abstract: We demonstrated an experimental observation of self-trapping and self-deflection of a two-dimensional optical beam by the photorefractive effect at telecommunication wavelengths under an applied de field. Self-trapping is effective for an intensity range related to the intensity-temperature resonance known for two-wave mixing in InP:Fe. The photorefractive index change giving rise to the trapping is measured at 10^{-4} , while the photorefractive space-charge field is measured at about 50 kV/cm, ten times higher than the applied field. We show experimentally that this index change creates a waveguide that can be used to guide a second beam at 1.55 μm . (C) 1997 American Institute of Physics.

ISSN: 0003-6951

Record 135 of 171

Author(s): Lantz, E; Devaux, F

Title: Parametric amplification of images

Source: QUANTUM AND SEMICLASSICAL OPTICS, 9 (2): 279-286 APR 1997

Abstract: Image parametric amplification and its applications are summarized. The link between resolution and phase matching is presented. Then applications to ultrafast imaging and imaging through diffusing media are given. Last, degenerate schemes are proved to permit polychromatic amplification as well as phase-sensitive amplification.

ISSN: 1355-5111

Record 136 of 171

Author(s): Lantz, E; Gindre, D; Maillotte, H; Monneret, J

Title: Phase matching for parametric amplification in a single-mode birefringent fiber: Influence of the non-phase-matched waves

Source: JOURNAL OF THE OPTICAL SOCIETY OF AMERICA B-OPTICAL PHYSICS, 14 (1): 116-125 JAN 1997

Abstract: In a single-mode birefringent fiber, phase matching in four-photon parametric amplification implies linear terms, which are due to dispersion and birefringence, and nonlinear terms, which are due to self- and cross-phase modulations. In the normal-dispersion regime combinations of these terms lead to three phase-matched regimes. When the pump is equally divided between the two polarizations one must take the nonphase-matched waves into account to obtain accurate values of the phase-matched wavelengths and of the gain. To calculate these parameters we analytically develop corrected models of both the four-wave mixing formalism and of the modulation instability formalism and show the correspondence between these two approaches. Then we experimentally show that the parametric gain increases with the value of the birefringence. (C) 1997 Optical Society of America.

ISSN: 0740-3224

Record 137 of 171

Author(s): Chauvet, M; Towe, T; Salamo, GJ; Bliss, DF; Bryant, G; Iseler, G

Title: Phase shift between index and intensity patterns in photorefractive two-wave mixing experiments in InP:Fe

Source: OPTICS COMMUNICATIONS, 134 (1-6): 211-217 JAN 15 1997

Abstract: The phase shift between the intensity pattern and the index pattern in two-wave mixing experiments has been determined from measured values of photorefractive two-wave mixing gain and diffraction efficiency in a bulk InP:Fe crystal as a function of the total incident intensity. Remarkably, the phase shift varies from 0 to 180 degrees with a value of 90 degrees at the intensity for which the two-wave mixing gain peaks. Comparison between theory and experiment yields values for sample Fe^{2+} and Fe^{3+} concentrations.

ISSN: 0030-4018

Record 138 of 171

Author(s): Hernandez, FE; Marcano, A; Maillotte, H

Title: Sensitivity of the total beam profile distortion Z-scan for the measurement of nonlinear refraction

Source: OPTICS COMMUNICATIONS, 134 (1-6): 529-536 JAN 15 1997

Abstract: A comparison of the sensitivity of the recently proposed total beam profile distortion Z-scan to the well-known Z-scan and Eclipsing Z-scan techniques is presented. Experimental sensitivities are measured in the picosecond pulsed regime for studying Kerr nonlinearity in CS_2 and in the cw-regime for studying thermal nonlinear refraction in an ethanol solution of malachite green. It is shown that the sensitivity of the new method is enhanced by more than one order of magnitude with respect to the usual Z-scan and more than five times with respect to the Eclipsing Z-scan.

ISSN: 0030-4018

Record 139 of 171

Author(s): McHugh, MP; Zalamansky, G; Vernotte, F; Lantz, E

Title: Pulsar timing and the upper limits on a gravitational wave background: A Bayesian approach

Source: PHYSICAL REVIEW D, 54 (10): 5993-6000 NOV 15 1996

Abstract: Stringent limits on Ω , the energy density in a gravitational wave background per logarithmic frequency interval in units of the closure density, have recently been suggested by Thorsett and Dewey using observational data of PSR B1855+09. We show that their use of the Neyman-Pearson test of hypotheses cannot, in the general case, provide reliable upper limits on an unknown parameter. The alternative presented here is the calculation of the probability distribution and repartition function for Ω using a Bayesian formalism. A prior distribution must be specified and the choice of "Jeffreys' prior" is justified on the grounds that it best represents a total lack of prior knowledge about the parameter. The Bayesian approach yields an upper limit at 95% confidence of 9.3×10^{-8} for Ωh^2 . This limit is less stringent by a factor of 10 than that placed by Thorsett and Dewey.

ISSN: 0556-2821

Record 140 of 171

Author(s): Chauvet, M; Hawkins, SA; Salamo, GJ; Segev, M; Bliss, DF; Bryant, G

Title: Self-trapping of planar optical beams by use of the photorefractive effect in InP:Fe

Source: OPTICS LETTERS, 21 (17): 1333-1335 SEP 1 1996

Abstract: We demonstrate what we believe to be the first experimental observation of self-trapping and self-deflection of a planar optical beam by the photorefractive effect in a semiconductor. The semiconductor material is indium phosphide doped with iron. We show that the observed focusing and defocusing effects follow the component of the two-wave-mixing space charge field that is in phase with the intensity pattern, whereas the spatial beam deflection effects follow the 90 degrees-shifted component. (C) 1996 Optical Society of America

ISSN: 0146-9592

Record 141 of 171

Author(s): Devaux, F; Lantz, E; Maillotte, H

Title: Imaging through scattering media by parametric image amplification

Source: JOURNAL OF NONLINEAR OPTICAL PHYSICS & MATERIALS, 5 (2): 413-417 APR 1996

Abstract: Parametric image amplification is proposed as a new solution for detecting objects hidden by scattering media. An image of a resolution chart has been obtained through a milk cell 18 scattering mean free paths thick. The ballistic light is amplified with a mean gain of 40 dB and the resolution on the object is about 20 μ m.

ISSN: 0218-1991

Record 142 of 171

Author(s): Fanjoux, G; Millot, G; Lavorel, B

Title: Collisional shifting and broadening coefficients for the rovibrational anisotropic S(J) lines of nitrogen studied by inverse Raman spectroscopy

Source: JOURNAL OF RAMAN SPECTROSCOPY, 27 (6): 475-483 JUN 1996

Abstract: Line shifting and broadening coefficients of the anisotropic S(J) lines ($v = 0, J \rightarrow v = 1, J + 2$) of the nitrogen molecule were measured at room temperature using high-resolution stimulated Raman spectroscopy. A rotational quantum number dependence of the S(J) line shifts was observed. In order to avoid an asymmetry of experimental origin, a suitable theoretical profile was fitted to the experimental lineshapes. This study allows the testing of the theoretical methods for calculating the line broadening coefficients in anisotropic Raman scattering, which have already been used in the analysis of infrared absorption data. The behaviour of the modified sum rule and the RPA (random phase approximation) methods was studied.

ISSN: 0377-0486

Record 143 of 171

Author(s): Fanjoux, G; Chau, R; Millot, G

Title: Shot-by-shot frequency calibration of CARS spectra: Application to the measurement of the collisional line shift in oxygen

Source: APPLIED PHYSICS B-LASERS AND OPTICS, 62 (5): 521-525 MAY 1996

Abstract: A technique using a Fabry-Perot interferometer has been developed to calibrate high-resolution spectra obtained by Coherent Anti-Stokes Raman Spectroscopy (CARS). This technique was used to measure simultaneously the Raman frequency and the Raman signal at each laser shot. We demonstrate the accuracy of the method by measuring the Q(15) line shifts of molecular oxygen due to collisions with oxygen and water vapour.

ISSN: 0946-2171

Record 144 of 171

Author(s): Vernotte, F; Zalamansky, G; McHugh, M; Lantz, E

Title: Cutoff frequencies and noise power law model of spectral density: Adaptation of the multivariate method for irregularly spaced timing data using the lowest-mode estimator approach

Source: IEEE TRANSACTIONS ON ULTRASONICS FERROELECTRICS AND FREQUENCY CONTROL, 43 (3): 403-409 MAY 1996

Abstract: The concept of structure functions [1], which is an extension of the variance approach, is useful to determine the variance (the structure function) which is optimized for a type of noise and for an order of drift. The multivariate method was developed to use different variances over the same signal. It is then possible to select a set of variances in which each variance is optimized to the determination of one parameter (of one noise level, drift, or cutoff frequency). Recently, we adapted this method to irregularly spaced timing data. In this connection, we replaced the structure functions by another method of spectral density estimation: the lowest-mode estimator, introduced by Deeter and Boynton for the analysis of pulsar timing data [2], [3]. Different lowest-mode estimators can be constructed according to two priorities: the order of drifts that must be removed and the type of noise for which the sensitivity must be maximum. Thus, a multivariate system is developed using a set of different estimators. The details of this method are described, and the results for different signals are discussed in this paper.

ISSN: 0885-3010

Record 145 of 171

Author(s): Millot, G; Lavorel, B; Fanjoux, G

Title: Pressure broadening, shift, and interference effect for a multiplet line in the rovibrational anisotropic stimulated raman spectrum of molecular oxygen

Source: JOURNAL OF MOLECULAR SPECTROSCOPY, 176 (1): 211-218 MAR 1996

Abstract: High-resolution stimulated inverse Raman spectroscopy has been applied to the study of collisional broadening, shifting, and line mixing for the O-o(J, N = 5) triplet line of the fundamental vibrational band of molecular oxygen. Accurate line broadening coefficients for the individual J components within the triplet have been measured for the first time and show a significant J dependence. The line broadening coefficients are larger than those previously obtained for unresolved pure rotational Raman lines. The additional broadening is expected to result from electronic spin relaxation. The pressure-induced line shift has been obtained for this line and compared to the value obtained for the fundamental Q branch. By applying the Rosenkranz perturbation treatment to the collisionally mixed components of the triplet line, we have been able to obtain an estimate of the coupling parameters. (C) 1996 Academic Press, Inc.

ISSN: 0022-2852

Record 146 of 171

Author(s): Marcano, AO; Maillotte, H; Gindre, D; Metin, D

Title: Picosecond nonlinear refraction measurement in single-beam open Z scan by charge-coupled device image processing

Source: OPTICS LETTERS, 21 (2): 101-103 JAN 15 1996

Abstract: We propose a picosecond single-beam open Z-scan experiment in which the usual apertured detection scheme is replaced by a two-dimensional single-shot CCD camera. This enables us to extract the two-dimensional transverse modifications of the whole far-field pattern that are due to nonlinear refraction as well as to measure the induced nonlinear phase shift with increased sensitivity compared with that of the conventional Z scan. (C) 1996 Optical Society of America

ISSN: 0146-9592

Record 147 of 171

Author(s): LAVOREL, B; FANJOUX, G; MILLOT, G; BONAMY, L; EMOND, F

Title: LINE COUPLING EFFECTS IN ANISOTROPIC RAMAN Q-BRANCHES OF THE $\nu(1)/2-\nu(2)$ FERMI DYAD IN CO₂

Source: JOURNAL OF CHEMICAL PHYSICS, 103 (23): 9903-9906 DEC 15 1995

Abstract: The generalized energy corrected sudden model is used to calculate the Q branch of the anisotropic coherent anti-Stokes Raman scattering spectra corresponding to the $\nu(1)$ and $2\nu(2)$ transitions of the Fermi dyad of CO₂. The corresponding experimental spectra have been recorded for pressures leading to a consistent overlapping between the rotational components. This leads to a new experimental evaluation of the relaxation time of the second-order tensor associated with the rotational angular momentum. The value is in excellent agreement with that already obtained from the study of the infrared absorption Q branch, the Rayleigh scattering, and the viscomagnetic effect. (C) 1995 American Institute of Physics.

ISSN: 0021-9606

Record 148 of 171

Author(s): DEVAUX, F; LANTZ, E

Title: PARAMETRIC AMPLIFICATION OF A POLYCHROMATIC IMAGE**Source:** JOURNAL OF THE OPTICAL SOCIETY OF AMERICA B-OPTICAL PHYSICS, 12 (11): 2245-2252 NOV 1995

Abstract: The picosecond parametric amplification of a polychromatic image with a wavelength bandwidth of 140 nm and a gain of 15 dB has been obtained in a Lithium triborate type-I crystal (LBO). Approximately 8 lines/mm in both lateral dimensions were resolved in the crystal plane. This resolution value is in good agreement with a numerical study of the phase-matching conditions near collinear degeneracy, where phase matching is noncritical for the signal beam in angle as well as in wavelength. The parametric amplification of a monochromatic image in LBO is also studied. Because their polarizations are identical, the signal and the idler can interfere, leading to phase-sensitive amplification. (C) 1995 Optical Society of America

ISSN: 0740-3224

Record 149 of 171**Author(s):** CHAUVET, M; HERVE, D; MAINGUET, B; REBEJAC, B; SALAUN, S; LECORRE, A; VIALLET, JE**Title:** PHOTOREFRACTIVE SEMICONDUCTOR SINGLE-MODE WAVE-GUIDES GROWN BY GAS-SOURCE MOLECULAR-BEAM EPITAXY**Source:** OPTICS LETTERS, 20 (15): 1604-1606 AUG 1 1995

Abstract: Two semiconductor single-mode waveguides have been fabricated to study the photorefractive effect in epilayers grown on an InP:Fe substrate. The first experimental results obtained in these structures are reported. At 1.55- μ m wavelength, a 0.53-cm(-1) gain is observed in contradirectional two-wave mixing and a 4-cm(-1) gain is measured in codirectional two-wave mixing with a 5.7-kV/cm applied field. The gain dependence versus the Light intensity and the applied field is also discussed. (C) 1995 Optical Society of America.

ISSN: 0146-9592

Record 150 of 171**Author(s):** DEVAUX, F; LANTZ, E**Title:** TRANSFER-FUNCTION OF SPATIAL-FREQUENCIES IN PARAMETRIC IMAGE AMPLIFICATION - EXPERIMENTAL-ANALYSIS AND APPLICATION TO PICOSECOND SPATIAL-FILTERING**Source:** OPTICS COMMUNICATIONS, 114 (3-4): 295-300 FEB 1 1995

Abstract: We recently performed the parametric amplification of a monochromatic near-infrared image, in a KTP crystal with a resolution of 60 X 80 points and a gain of 15 dB. In this paper, we directly measure the transfer function of spatial frequencies by recording the image Fourier plane. This analysis confirms the link between the phase-matching conditions and the resolution. Moreover, parametric amplification can act either as a low pass filter or as a band-pass filter, depending of the orientation of the crystal. Consequently, basic image processing operation can be performed.

ISSN: 0030-4018

Record 151 of 171**Author(s):** CHAUVET, M; LEFORT, M**Title:** PRESERVING GENETIC DIVERSITY IS INDISPENSABLE**Source:** RECHERCHE, 25 (271): 1329-1332 DEC 1994**ISSN:** 0029-5671

Record 152 of 171**Author(s):** HERVE, D; CHAUVET, M; VIALLET, JE; CHAWKI, MJ**Title:** FIRST TUNABLE NARROW-BAND 1.55-MU-M OPTICAL DROP FILTER USING A DYNAMIC PHOTOREFRACTIVE GRATING IN IRON-DOPED INDIUM-PHOSPHIDE**Source:** ELECTRONICS LETTERS, 30 (22): 1883-1884 OCT 27 1994

Abstract: A tunable narrowband (FWHM= 2.5 GHz) 1.55 μ m reflective drop filter is realised in an iron doped indium phosphide crystal. The index grating results from the photorefractive effect via an interference pattern. The grating period is determined by the wavelength of the laser diode which provides the two counterpropagating writing beams.

ISSN: 0013-5194

Record 153 of 171**Author(s):** GINDRE, D; MAILLOTTE, H; MONNERET, J; LANTZ, E; FROEHLI, C**Title:** COHERENT PICOSECOND PARAMETRIC AMPLIFICATION THROUGH A KERR-INDUCED INDEX GRATING IN A SINGLE-MODE FIBER**Source:** OPTICS COMMUNICATIONS, 112 (1-2): 75-79 NOV 1 1994

Abstract: Picosecond parametric amplification in a single-mode fiber is experienced and explained by means of phase modulation through a Kerr-induced refractive index grating in the material. In the visible range (strong group-velocity dispersion), the experimental gain is 17 dB.

ISSN: 0030-4018

Record 154 of 171

Author(s): FANJOUX, G; MILLOT, G; SAINTLOUP, R; CHAUX, R; ROSENMANN, L

Title: COHERENT ANTI-STOKES-RAMAN SPECTROSCOPY STUDY OF COLLISIONAL BROADENING IN THE O-2-H2O Q-BRANCH

Source: JOURNAL OF CHEMICAL PHYSICS, 101 (2): 1061-1071 JUL 15 1994

Abstract: The fundamental isotropic Raman e branch of oxygen perturbed by collisions with water vapor has been studied at pressures up to 1.5 atm and for temperatures between 446 and 990 K. The spectra have been recorded by using coherent anti-Stokes Raman spectroscopy (CARS) which has been preferred to stimulated Raman spectroscopy (SRS) in order to obtain more signal and higher sensitivity as the mixture has a small percentage of oxygen. The high resolution CARS spectrometer uses a seeded Nd:YAG laser actively stabilized on an external Fabry-Perot interferometer to prevent any frequency drift during the course of the experiment. The line broadening coefficients have been determined for several rotational quantum numbers (up to $N=31$ at 990 K). The effect of the splitting into triplets at lower pressure and the effect of interferences between neighboring lines at higher pressure have been taken into account. The influence of Dicke narrowing has also been considered and special care has been taken to avoid Stark broadening. The line broadening coefficients have been calculated according to a semiclassical model. The rotational quantum number and temperature dependencies of the experimental line broadening coefficients have also been studied with another approach based on fitting and scaling laws. Among several laws, the modified exponential energy gap law (MEG), the statistical power-exponential gap law (SPEG), and the energy corrected sudden law with basis rate constants taken as a hybrid exponential-power law (ECS-EP) have given good results; We have used the fitting and scaling laws to extrapolate in temperature the linewidths at 2000 K.

ISSN: 0021-9606

Record 155 of 171

Author(s): MAILLOTTE, H; MONNERET, J; BARTHELEMY, A; FROEHLI, C

Title: LASER-BEAM SELF-SPLITTING INTO SOLITONS BY OPTICAL KERR NONLINEARITY

Source: OPTICS COMMUNICATIONS, 109 (3-4): 265-271 JUL 1 1994

Abstract: The presented experiment consists in the high intensity picosecond excitation of a bulk Kerr medium by sinusoidal interference patterns of high spatial frequency. These patterns generate light-induced Bragg refractive index gratings exhibiting nearly periodic self-organization of the well-known catastrophic break-up of the laser beam. Thus, self-focusing leads to self-trapped structures, whose features satisfactorily agree with shapes and intensities of a set of fundamental soliton beams.

ISSN: 0030-4018

Record 156 of 171

Author(s): MAILLOTTE, H; MONNERET, J; FROEHLI, C

Title: SELF-INDUCED MULTIPLE SOLITON-LIKE BEAMS BY STIMULATED SCATTERING

Source: OPTICS COMMUNICATIONS, 109 (3-4): 272-278 JUL 1 1994

Abstract: The presented experiment consists in the high intensity picosecond excitation, above the stimulated scattering thresholds, of a bulk Kerr medium by sinusoidal interference patterns of high spatial frequency. Light-induced pin gratings are created. They perform a distributed feedback which permits the usually unstable stimulated Raman (picosecond regime) and Brillouin (nanosecond regime) sources to couple themselves into multiple self-trapped structures, whose features satisfactorily agree with those of soliton beams.

ISSN: 0030-4018

Record 157 of 171

Author(s): LAVOREL, B; MILLOT, G; FANJOUX, G; SAINTLOUP, R

Title: STUDY OF COLLISIONAL EFFECTS ON BAND SHAPES OF THE $\nu(1)/2-\nu(2)$ FERMI DYAD IN CO₂ GAS WITH STIMULATED RAMAN-SPECTROSCOPY .3. MODELING OF COLLISIONAL NARROWING AND STUDY OF VIBRATIONAL SHIFTING AND BROADENING AT HIGH-TEMPERATURE

Source: JOURNAL OF CHEMICAL PHYSICS, 101 (1): 174-177 JUL 1 1994

Abstract: High resolution stimulated Raman spectra (SRS) of the $\nu(1)/2-\nu(2)$ Fermi dyad of CO₂ have been recorded in the 0.4-22. amagat density range at 700 K and in the 0.6-16 amagat density range at 900 K. The data have been successfully analyzed with a theoretical model taking into account both rotational line mixing through the energy corrected sudden-polynomial (ECS-P) law for the relaxation matrix and vibrational line broadening $\gamma(\nu)$ and line shifting $\delta(\nu)$. The two

vibrational parameters have been accurately determined from fit to the experimental spectra. These new high temperature data together with previous data obtained at 295 and 500 K [B. Lavorel et al., J. Chem. Phys. 93, 2176 (1990); B. Lavorel et al., J. Chem. Phys. 93, 2185 (1990)] entirely determine the temperature dependence in the 295-900 K range of Raman band shapes of ν_1 and ν_2 in a large pressure range. These results will be very useful in CARS thermometry. A few coherent anti-Stokes Raman spectra (CARS) recorded in the 1100-1300 K domain are consistent with extrapolations of the 295-900 K data.

ISSN: 0021-9606

Record 158 of 171

Author(s): LANTZ, E; METIN, D; CORNET, E; LACOURT, A

Title: TRANSMISSION OF A GAUSSIAN-BEAM THROUGH A NONLINEAR THIN-FILM NEAR THE TOTAL-REFLECTION STATE

Source: JOURNAL OF THE OPTICAL SOCIETY OF AMERICA B-OPTICAL PHYSICS, 11 (2): 347-354 FEB 1994

Abstract: We show by numerical simulation that a small-radius Gaussian beam impinging upon a thin nonlinear film can switch from a total reflection state to a transmission state if the Kerr nonlinearity is positive. The phenomenon is nonresonant and is similar to interface switching. On the other hand, great differences from previous plane-wave models appear. Extension of these results to wider beams seems possible according to qualitative and quantitative arguments. For a negative nonlinearity the thin film acts as a Limiter of the transmitted intensity. For wide beams results are similar to plane-wave results.

ISSN: 0740-3224

Record 159 of 171

Author(s): VERNOTTE, F; LANTZ, E; GROSLAMBERT, J; GAGNEPAIN, JJ

Title: OSCILLATOR NOISE-ANALYSIS - MULTIVARIANCE MEASUREMENT

Source: IEEE TRANSACTIONS ON INSTRUMENTATION AND MEASUREMENT, 42 (2): 342-350 APR 1993

Abstract: Since the noise altering the output signal of oscillators may be modeled as power laws in the spectral density of frequency deviation, oscillator noise analysis is the measurement of the level of each power law noise. The principle of this new multivariate method consists of obtaining the noise-type contributions with different variances and different integration time values. The whole data obtained from the different variances with the different integration times are then operated simultaneously. Thus, the most probable measurement, in the sense of least squares, is obtained for each type of noise. Moreover, this method lends itself to an estimation of the uncertainty of the noise-type contribution measurement, taking into account the dispersion of the variance results.

ISSN: 0018-9456

Record 160 of 171

Author(s): MILLOT, G; LAVOREL, B; FANJOUX, G; WENGER, C

Title: DETERMINATION OF TEMPERATURE BY STIMULATED RAMAN-SCATTERING OF MOLECULAR NITROGEN, OXYGEN, AND CARBON-DIOXIDE

Source: APPLIED PHYSICS B-PHOTOPHYSICS AND LASER CHEMISTRY, 56 (5): 287-293 MAY 1993

Abstract: We have determined the temperature from SRS spectra of N_2-N_2 , N_2-CO_2 , O_2-O_2 , and CO_2-CO_2 recorded in wide pressure and temperature ranges. The fitting procedure takes simultaneously into account the Dicke effect and motional narrowing. We have quantified the accuracy of the MEG and ECS-P models for rotational relaxation. The temperature extracted from each model is compared with thermocouple measurements. The influence of vibrational broadening and shifting is discussed in detail.

ISSN: 0721-7269

Record 161 of 171

Author(s): LANTZ, E; HAN, L; LACOURT, A; ZYSS, J

Title: SIMULTANEOUS ANGLE AND WAVELENGTH ONE-BEAM NONCRITICAL PHASE MATCHING IN OPTICAL PARAMETRIC AMPLIFICATION

Source: OPTICS COMMUNICATIONS, 97 (3-4): 245-249 MAR 15 1993

Abstract: A collinear degenerate configuration permits parametric amplification of a signal that is one-beam noncritical for the signal wavelength as well as for the signal direction, while the direction and the wavelength of the pump beam are critical.

ISSN: 0030-4018

Record 162 of 171

Author(s): LANTZ, E

Title: OPTIMAL EXPRESSION OF THE IMAGING TENSOR IN PARTIALLY COHERENT MICROSCOPY

Source: JOURNAL OF OPTICS-NOUVELLE REVUE D OPTIQUE, 22 (5): 211-217 SEP-OCT 1991

Abstract: In partially coherent microscopy, the spectrum of the image of a space-limited object can be expanded on a basis of orthogonal functions characterizing the optical system. It is shown that optimum image functions are obtained by Karhunen Loeve transform. This optimum expansion of the image and the optimum expansion of the object on a prolate spheroidal wave-function basis allow the optimum partially coherent imaging tensor to be computed.

ISSN: 0150-536X

Record 163 of 171

Author(s): STEINFELD, JI; RUTTENBERG, P; MILLOT, G; FANJOUX, G; LAVOREL, B

Title: SCALING LAWS FOR INELASTIC-COLLISION PROCESSES IN DIATOMIC-MOLECULES

Source: JOURNAL OF PHYSICAL CHEMISTRY, 95 (24): 9638-9647 NOV 28 1991

Abstract: A variety of fitting and scaling laws have been developed for the purpose of modeling rotational energy transfer (RET) in diatomic molecules. These include exponential energy gap (EGL), statistical power gap (SPG), and dynamically based angular-momentum scaling laws (e.g., the energy-corrected sudden approximation, ECS). These scaling laws are tested against state-to-state energy-transfer data for diatomic halogens, and stimulated Raman Q-branch band shapes in nitrogen. For state-to-state RET in halogens, an ECS scaling law, modified to account for restrictions on angular-momentum transfer, is found to be superior to the EGL. When all available data on Raman band shapes in N₂, particularly including the collision-induced Raman line shifts, are taken into account, the angular-momentum-based ECS-EP scaling law again provides the best representation of the data. We conclude that dynamically based scaling laws are to be preferred for modeling rotational energy transfer in diatomic molecules. Several unresolved questions and possible future directions for energy-transfer scaling laws and fitting procedures are discussed, including extension to polyatomic systems, possible contributions to the line width from elastic dephasing processes, and the development of global fitting procedures which will simultaneously account for line shape, line shift, and (when available) state-to-state RET measurements on molecular systems.

ISSN: 0022-3654

Record 164 of 171

Author(s): MAILLOTTE, H; PIERALLI, C; TRIBILLON, G

Title: A SINGLE ROD STABLE RESONATOR OF CONSTANT MULTIMODE DIVERGENCE OVER A WIDE POWER RANGE

Source: JOURNAL OF MODERN OPTICS, 38 (11): 2311-2321 NOV 1991

Abstract: Theoretical calculation of multimode divergence of a single rod stable resonator leads to a laser design for obtaining constant divergence over a wide output power range, the confocal symmetric resonator, that can be simply implemented for industrial applications.

ISSN: 0950-0340

Record 165 of 171

Author(s): LANTZ, E

Title: RETRIEVAL OF A PHASE-AND-AMPLITUDE SUBMICROMETRIC OBJECT FROM IMAGES OBTAINED IN PARTIALLY COHERENT MICROSCOPY

Source: JOURNAL OF THE OPTICAL SOCIETY OF AMERICA A-OPTICS IMAGE SCIENCE AND VISION, 8 (5): 791-800 MAY 1991

Abstract: A one-dimensional submicrometric object and its image obtained by partially coherent microscopy can be optimally expanded on a basis of linear prolate spheroidal wave functions. Hence the bilinear transfer becomes a product of the vector that represents the object and of an imaging system tensor. This formalism permits a phase-and-amplitude object to be retrieved from differently focused images. The number of degrees of freedom of the object that can be effectively retrieved is shown to be a logarithmic function of the signal-to-noise ratio in the image. The method is extended to the retrieval of the sum of a space-limited object and a constant background with infinite support.

ISSN: 0740-3232

Record 166 of 171

Author(s): MAILLOTTE, H; MONNERET, J; FROEHLI, C

Title: DISTRIBUTED FEEDBACK PICOSECOND RAMAN LASER-EMISSION FROM CS₂

Source: OPTICS COMMUNICATIONS, 79 (3-4): 259-266 OCT 15 1990

ISSN: 0030-4018

Record 167 of 171

Author(s): VERNOTTE, F; CHARRAUT, D; LANTZ, E; COURJON, D

Title: KARHUNEN-LOEVE TRANSFORM IN OPTICAL MICROSCOPY - APPLICATION TO LINEWIDTH MEASUREMENT

Source: OPTICAL ENGINEERING, 29 (9): 1151-1156 SEP 1990

ISSN: 0091-3286

Record 168 of 171

Author(s): MAILLOTTE, H; MONNERET, J; FROEHLI, C

Title: NOISE-FREE PHASE CONJUGATION OF HIGH-POWER SINGLE-MODE LASER-BEAMS BY STIMULATED BRILLOUIN-SCATTERING

Source: OPTICS COMMUNICATIONS, 77 (2-3): 241-246 JUN 15 1990

ISSN: 0030-4018

Record 169 of 171

Author(s): LANTZ, E; DUVERNOY, J

Title: STABILITY OF MODEL AND SELECTION OF PARAMETERS - APPLICATION TO METROLOGY IN OPTICAL MICROSCOPY

Source: JOURNAL OF MODERN OPTICS, 36 (9): 1213-1226 SEP 1989

ISSN: 0950-0340

Record 170 of 171

Author(s): LANTZ, E

Title: SUBPIXEL SIGNAL CENTERING AND SHIFT MEASUREMENT USING A RECURSIVE SPECTRAL PHASE ALGORITHM

Source: SIGNAL PROCESSING, 17 (4): 365-372 AUG 1989

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