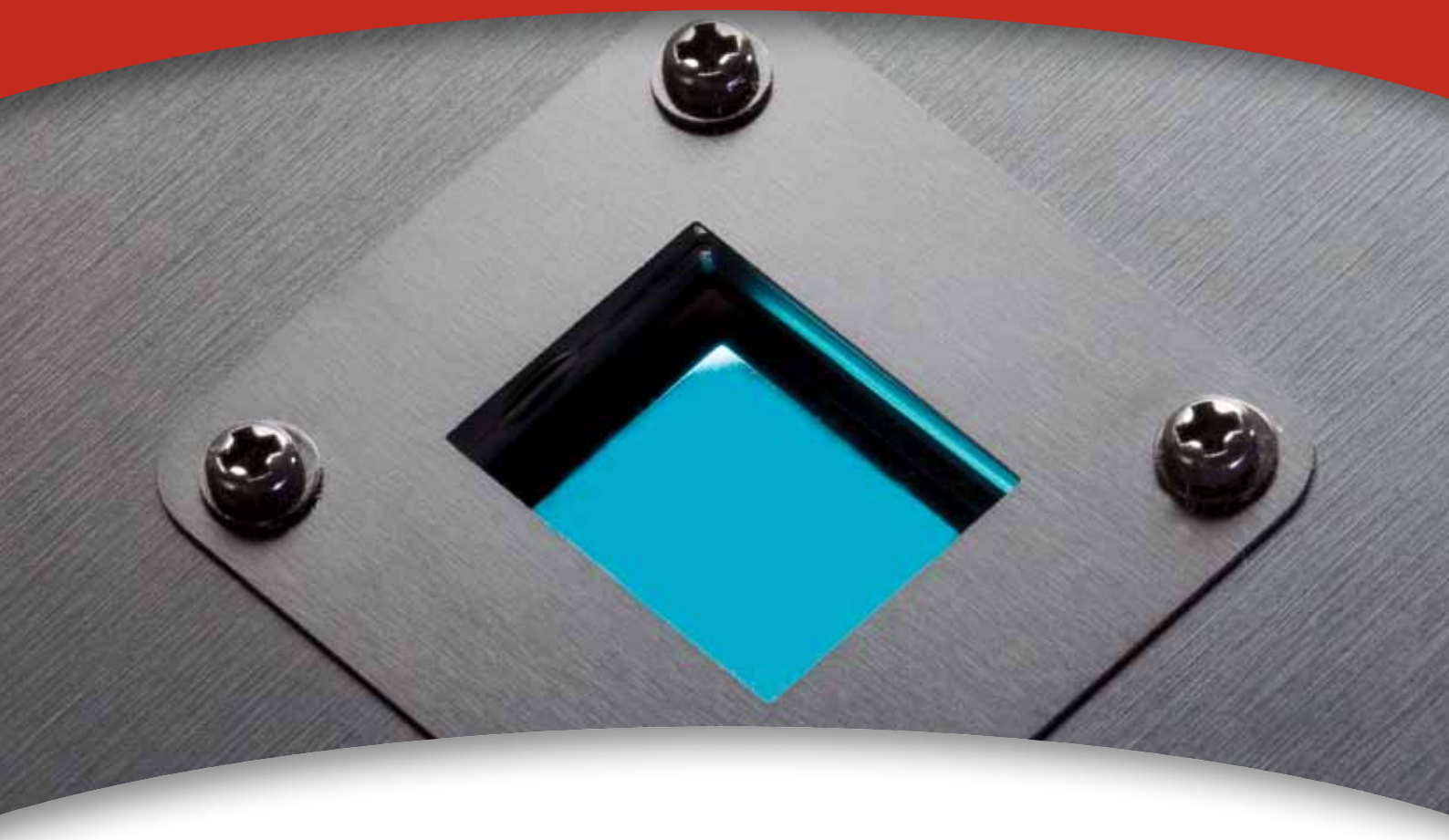
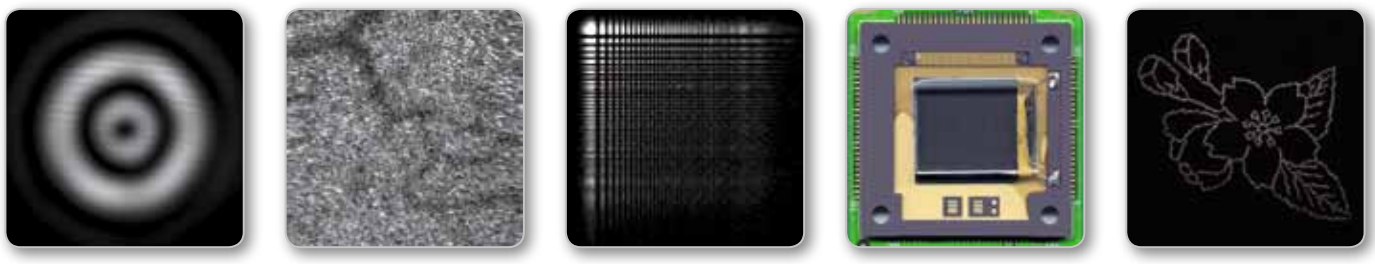
LCOS-Spatial Light Modulator
X10468



Customer Testimonials
and Selected Scientific Publications



HAMAMATSU
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Testimonials

University of Cambridge, Department of Physics, Atomic, Mesoscopic and Optical Physics (AMOP) Group

Stuart Moulder

We acquired a LCOS SLM X10468-02 as its versatility makes it a valuable tool in the field of ultra-cold gases. The first project uses the SLM to generate high order Laguerre Gauss (LG) beams by use of a phase winding, where the angular momentum of the beam is used to induce rotation in a Bose-Einstein condensate. Compared to conventional methods of stirring the cloud, transitions with LG beams provide a stable method to achieve states of high angular momentum to explore the superfluid state. The low aberrations of the SLM mean we were able to run standard correction algorithms to achieve high purity and uniformity LG beams with relative ease, suitable for our needs. The exceptional efficiency and power threshold of the SLM provide the added ability to create high intensity LG beams to address the atoms with. Secondly we are also looking to use the SLM to produce a range of custom optical trapping potentials which give us a new level of control over the atomic cloud. The dielectric mirror gives good operation over a wide range of wavelengths which make the SLM useful for generating both attractive and repulsive potentials.

Imperial College, Department of Physics, London, England

Professor Paul French, Head of Photonics Group

We acquired an SLM X10468-02 to be included in our stimulated emission depletion (STED) microscopy system. STED achieves super resolved imaging through the use of a depletion beam with a "hole" of zero intensity at its centre. One way to achieve such a beam is to diffract a laser beam off a grating structure with a helical phase variation. This is readily achieved using a Spatial Light Modulator to encode the required hologram. The programmable nature of the digital hologram is particularly advantageous since it can be used compensate for optical aberrations acquired in the microscope beam path. For this application, low transmission losses and a high damage threshold are essential. We tested the Hamamatsu SLM X10468-02 because its broad spectra range (750 to 850 nm) covers the tunability we need for our STED beam and were delighted to observe that the overall diffraction efficiency into the first order was > 90 % while we observed very little power in the other diffraction orders. Together with the high damage threshold and the possibility to rapidly switch between different diffraction patterns, this makes the SLM a very promising addition to our STED microscope.

University of Oxford, Department of Engineering Science, UK

Dr. Alexander Jesacher

"We integrated the Hamamatsu LCoS SLM X10468-02 as a flexible diffractive optical element into our nanofabrication setup, where a short-pulsed high power laser beam is focussed into transparent material in order to perform local modifications of the material. The first experiments with the SLM integrated were about sensing for optical aberrations in the fabrication beam. The SLM was used to introduce different phase distortions from which we could deduce the real aberrations in the laser beam. A particular advantage of using the SLM compared to a deformable mirror in this experiment was that it allowed us to add binary diffraction gratings to the phase distortions, which reduced the amount of time necessary to perform the aberration measurements by a factor of 2. Two other major advantages of this system in particular are its high light utilization efficiency and high power handling capability, which is of utmost importance in our case, since we use a regeneratively amplified femtosecond laser."

University of St Andrews, UK

Professor Kishan Dholakia

"The optical trapping group at St Andrews has been actively engaged in beam shaping for a variety of applications in biophotonics over the last decade. This has included optical trapping studies, advanced beam propagation and cell transfection. We have been very impressed with the LCOS range of spatial light modulators from Hamamatsu and used them extensively in various demanding applications. They have proved to have very good characteristics for generating a wide array of beam profiles and we have been able to address them with appropriate software for full user control in our experiments. We are very excited with their future potential for various biophotonics applications."

University of Glasgow, UK

Professor Miles Padgett

"I am writing to tell you just how happy with have been with your LCOS, SLMs (X10468-01) in our quantum optics experiments. Their combination of high diffraction efficiency, low aberrations and ease of interfacing makes them ideal for us. Specifically we are using them to measure the spatial mode profile at the single photon level and applying this to a novel form of Ghost Imaging."

University of Liverpool, UK

Dr. Walter Perrie

"I would highly recommend this Company and their products to any potential collaborator or purchaser. In particular, with regard to the Spatial Light Modulator products, the X-10468 series, we have tested the NIR (-03), the visible (-04 and -01) systems with excellent results. In particular, the -03 and -04, with dielectric coatings, are able to handle high average laser powers > 3W. The products are well engineered and highly reliable and each device comes with a unique file correcting for any slight wavefront variations, important in precision work.

I have also been granted significant loan periods in order to assess the products and this was very useful in our evaluation of the potential of these devices for materials processing. We own one system and will soon acquire a second.

In short, Hamamatsu Photonics UK have been an excellent partner in our research work and I look forward to further future collaboration with them. Dr. Raymond Livingston, in particular has been very helpful and highly expert in these devices."
24/08/09

IPHT Institut für Photonische Technologien e.V., Jena, Germany
Professor Dr. Rainer Heintzmann
SLMs are a useful tool in optical microscopy research, e.g. to generate tailored light distributions. In our case, we wanted to generate extended focus illumination using a Bessel beam. This was created by a hologram, generating a ring of light in the back focal plane of a lens which is successively filtered by a spatial aperture.

We successfully achieved this by using a X10468-01 LCOS phase-only spatial light modulator (SLM) from Hamamatsu Photonics and displaying an optimised hologram calculated by an IFTA algorithm. The SLM was easy to use, and it displayed a phase pattern which remained stable over time. Achieving optical flatness was very straight-forward since Hamamatsu Photonics provided us with a correction hologram that was simply added to the theoretical pattern prior to its display. Finally, we tested the linearity of our SLM at 532 nm and convinced ourselves that it was close to perfect for our application. Using this product as well as interacting with the support of Hamamatsu was and still is a very enjoyable experience.

University of Southampton, Physical Optics Group, Optoelectronics Research Centre (ORC), UK
Dr. Ze (Sandy) Zhang
Our research group is working with ultrafast laser material processing. One of our main activities involve investigation of advanced photosensitivity and femtosecond direct writing of 3D photonic structures. Tightly focused laser pulses are used to modify bulk of transparent material. This requires tight control of spatial and temporal properties of the femtosecond laser pulses. Hence, we acquired a LCOS SLM X10468-03 as we want to integrate it into our writing setup. The spatial light modulator provides unique possibilities for material processing. The laser beam can be easily shaped into desired intensity and phase distribution. Thanks to the high power damage threshold of Hamamatsu SLM, we can easily achieve our goals with high intensity beams.

By using this spatial light modulator (SLM) from Hamamatsu Photonics, we successfully implemented a Gerchberg-Saxton algorithm for a hologram calculation. We also are exploring it for aberration compensation and polarization control.

We found the Hamamatsu spatial light modulator to be an extremely robust and versatile scientific device.

Selected Publications

Laser Material Processing

2012

Dun Liu, Walter Perrie, Leigh Mellor, Zheng Kuang, Eamonn Fearon, Stuart Edwardson, Geoff Dearden and Ken Watkins
"Picosecond Laserbeamshaping using a Spatial Light Modulator"
ICALEO Congress Proceeding, Paper M303, Sep 2012

Erik H. Waller, Michael Renner and Georg von Freymann
"Active aberration- and point-spread-function control in direct laser writing"
Optics Express, Vol. 20, Issue 22, pp. 24949-24956 (2012)

Masaaki Sakakuraa, Kiyotaka Miurab, Tsutomu Sawanoc, Yasuhiko Shimotsumaa and Kazuyuki Hiraob
"Three-dimensional structuring inside transparent materials by a phase modulated fs laser beam with a LCOS-SLM"
Proc. of SPIE Vol. 7920 792010-1 (2012)

P. S. Salter and M. J. Booth
"Focussing over the edge: adaptive subsurface laser fabrication up to the sample face"
Optics Express, Vol. 20, Issue 18, pp. 19978-19989 (2012)

O J Allegre, W Perrie, S P Edwardson, G Dearden and K G Watkins
"Laser microprocessing of steel with radially and azimuthally polarized femtosecond vortex pulses"
J. Opt. 14 085601 (2012)

Zheng Kuang, Walter Perrie, Dun Liu, Paul Fitzsimons, Stuart P. Edwardson, Eamonn Fearon, Geoff Dearden, Ken G. Watkins
"Ultrashort pulse laser patterning of indium tin oxide thin films on glass by uniform diffractive beam patterns"
Applied Surface Science 258 (2012) 7601-7606

2011

Benjamin P. Cumming, Alexander Jesacher, Martin J. Booth, Tony Wilson and Min Gu
"Adaptive aberration compensation for three-dimensional micro-fabrication of photonic crystals in lithium niobate"
Opt. Express 19, 9419-9425 (2011)

Richard D. Simmonds, Patrick S. Salter, Alexander Jesacher and Martin J. Booth
"Three dimensional laser microfabrication in diamond using a dual adaptive optics system"
Opt. Express 19, 24122-24128 (2011)

Patrick S. Salter and Martin J. Booth
"Addressable microlens array for parallel laser microfabrication"
Opt. Lett. 36, 2302-2304 (2011)

2010

D. Liu, Z. Kuang, W. Perrie, P. Scully, A. Baum, S. Edwardson, E. Fearon, G. Dearden and K. Watkins
"High-speed uniform parallel 3D refractive index micro-structuring of poly(methyl methacrylate) for volume phase gratings"
Applied Physics B: Lasers and Optics (15 September 2010), pp. 1-7-7

Alexander Jesacher, Graham D. Marshall, Tony Wilson and Martin J. Booth
"Adaptive optics for direct laser writing with plasma emission aberration sensing"
Opt. Express 18, 656-661 (2010)

Alexander Jesacher and Martin J. Booth
"Parallel direct laser writing in three dimensions with spatially dependent aberration correction"
Opt. Express 18, 21090-21099 (2010)

2009

Masaaki Sakakura, Tsutomu Sawano, Yasuhiko Shimotsuma, Kiyotaka Miura and Kazuyuki Hirao
"Parallel Drawing of Multiple Bent Optical Waveguides Using a Spatial Light Modulator"
Japanese Journal of Applied Physics 48 (2009) 126507

Zheng Kuang, Walter Perrie, Dun Liu, Stuart Edwardson, Jian Cheng, Geoff Dearden and Ken Watkins
"Diffractive multi-beam surface micro-processing using 10 ps laser pulses"
Applied Surface Science 255 (2009) 9040-9044

Dun Liu, Zheng Kuang, Shuo Shang, Walter Perrie, Dimitris Karnakis, Andrew Kearsley, Martyn Knowles, Stuart Edwardson, Geoff Dearden and Ken Watkins
"Ultrafast parallel laser processing of materials for high throughput manufacturing"
Proceedings of LAMP2009 – the 5th International Congress on Laser Advanced Materials Processing

Adaptive Optics and Ophthalmology

2012

Travis J. Gould, Daniel Burke, Joerg Bewersdorf and Martin J. Booth
"Adaptive optics enables 3D STED microscopy in aberrating specimens"
Optics Express, Vol. 20, Issue 19, pp. 20998-21009 (2012)

Jan Scrimgeour and Jennifer E. Curtis
"Aberration correction in wide-field fluorescence microscopy by segmented-pupil image interferometry"
Opt. Express 20, 14534-14541 (2012)

Ori Katz, Eran Small and Yaron Silberberg
"Looking around corners and through thin turbid layers in real time with scattered incoherent light"
Nature Photonics (2012), doi:10.1038/nphoton.2012.150

Kohei Takayama, Sotaro Ooto, Masanori Hangai, Naoko Arakawa, Susumu Oshima, Naohisa Shibata, Masaaki Hanebuchi, Takashi Inoue and Nagahisa Yoshimura
"High-Resolution Imaging of the Retinal Nerve Fiber Layer in Normal Eyes Using Adaptive Optics Scanning Laser Ophthalmoscopy"
PLoS ONE, 1 March 2012, Volume 7, Issue 3, e33158

2011

Hongxin Huang, Takashi Inoue, Haruyoshi Toyoda and Tsutomu Hara
"High-performance adaptive optics system with long-term stability using liquid-crystal-on-silicon spatial light modulator for high-resolution retinal imaging"
Proc. SPIE 8200, 2011 International Conference on Optical Instruments and Technology

Hongxin Huang, Takashi Inoue and Hiroshi Tanaka
"Stabilized high-accuracy correction of ocular aberrations with liquid crystal on silicon spatial light modulator in adaptive optics retinal imaging system"
Opt. Express 19, 15026-15040 (2011)

Tabernero J., Schwarz C., Fernández EJ and Artal P.
"Binocular visual simulation of a corneal inlay to increase depth of focus"
Invest Ophthalmol Vis Sci. 2011 Jul 15;52(8):5273-7

T. Čižmár, H.I.C. Dalgarno, P.C. Ashok, F.J. Gunn-Moore and K. Dholakia
"Optical aberration compensation in a multiplexed optical trapping system"
J. Opt. 13 044008 doi: 10.1088/2040-8978/13/4/044008

2010

Kohei Takeno and Tomohiro Shirai
"In vivo retinal imaging using liquid crystal adaptive optics with different color illumination"
Proc. of SPIE Vol. 7550 75502H-1 (2010)

Enrique J. Fernández, Pedro M. Prieto and Pablo Artal
"Adaptive optics binocular visual simulator to study stereopsis in the presence of aberrations"
J. Opt. Soc. Am. A 27, A48-A55 (2010)

2009

Enrique J. Fernández, Pedro M. Prieto and Pablo Artal
"Binocular adaptive optics visual simulator"
Opt. Lett. 34, 2628-2630 (2009)

University of Murcia
"Researchers at University of Murcia develop adaptive optics visual simulator using Hamamatsu Photonics' Liquid-Crystal-on-Silicon Spatial Light Modulator"
2009 Institute of Physics and IOP Publishing

Enrique J. Fernández, Pedro M. Prieto and Pablo Artal
"Binocular adaptive optics visual simulator,"
Opt. Lett. 34, 2628-2630 (2009)

Enrique J. Fernández, Pedro M. Prieto and Pablo Artal
"Wave-aberration control with a liquid crystal on silicon (LCOS) spatial phase modulator"
Opt. Express 17, 11013-11025 (2009)

Tomohiro Shirai, Kohei Takeno, Hidenobu Arimoto and Hiromitsu Furukawa
"Adaptive Optics with a Liquid-Crystal-on-Silicon Spatial Light Modulator and Its Behavior in Retinal Imaging"
Jpn. J. Appl. Phys. 48 (2009) 070213

Selected Publications

Optical Tweezers and Micromanipulation

2013

Deepak Kumar, Shankar Ghosh and S. Bhattacharya
"Transition of a particle between adjacent optical traps: A study using catastrophe theory"
Phys. Rev. E 87, 013202 (2013)

2012

Difato F., Tsushima H., Pesce M., Guiggiani A., Benfenati F., Blau A., Basso M., Vassalli M. and Chieregatti E.
"Axonal regeneration of cultured mouse hippocampal neurons studied by an optical nano-surgery system"
Proc. of SPIE Vol. 8207, 820760

David B. Ruffner and David G. Grier
"Optical conveyors: A class of active tractor beams"
Phys. Rev. Lett. 109, 163903 (2012)

Jung-Dae Kim, Sun-Uk Hwang and Yong-Gu Lee
"Traceable assembly of microparts using optical tweezers"
J. Micromech. Microeng. 22 (2012)

Kazuhisa Onda and Fumihito Arai
"Multi-beam bilateral teleoperation of holographic optical tweezers"
Opt. Express 20, 3633-3641 (2012)

2011

Esseling, M., Kemper, B., Antkowiak, M., Stevenson, D. J., Chaudet, L., Neil, M. A. A., French, P. W., von Bally, G., Dholakia, K. and Denz, C.
"Multimodal biophotonic workstation for live cell analysis"
J. Biophoton., 5: 9-13. (2012)

A. Guiggiani, B. Torre, A. Contestabile, F. Benfenati, M. Basso, M. Vassalli and F. Difato
"Long-range and long-term interferometric tracking by static and dynamic force-clamp optical tweezers"
Opt. Express 19, 22364-22376 (2011)

Maria Leilani Torres-Mapa, Maciej Antkowiak, Hana Cizmarova, David E. K. Ferrier, Kishan Dholakia and Frank J. Gunn-Moore
"Integrated holographic system for all-optical manipulation of developing embryos"
Biomed. Opt. Express 2, 1564-1575 (2011)

Yusuke Ogura, Yuki Kazayama, Takahiro Nishimura and Jun Tanida
"Large-area manipulation of microdroplets by holographic optical tweezers based on a hybrid diffractive system"
Appl. Opt. 50, H36-H41 (2011)

Sheng-Yang Tseng and Long Hsu
"Controlling the transverse momentum distribution of a light field via azimuth division of a hologram in holographic optical tweezers"
Appl. Opt. 50, H62-H67 (2011)

K. Dholakia and T. Čižmár
"Shaping the future of manipulation"
nphoton.2011.80

Sun-Uk Hwang, Yong-Jin Kim, Gyu-Chul Yi and Yong-Gu Leea
"Near-axial rotation of nanorods by focused laser beams using dual-beam method"
J. Nanophoton. 5, 053507 (May 13, 2011)

O. Brzobohatý, V. Karásek, M. Šiler, J. Trojek and P. Zemánek
"Static and dynamic behavior of two optically bound microparticles in a standing wave"
Opt. Express 19, 19613-19626 (2011)

Arnau Farré, Marjan Shayegan, Carol López-Quesada, Gerhard A. Blab, Mario Montes-Usategui, Nancy R. Forde and Estela Martín-Badosa
"Positional stability of holographic optical traps"
Opt. Express 19, 21370-21384 (2011)

Ione Verdeny, Arnau Farré, Josep Mas, Carol López-Quesada, Estela Martín-Badosa and Mario Montes-Usategui,
"Optical trapping: A review of essential concepts"
Opt. Pura Apl. 44 (3) 527-551 (2011)

Francesco Difato, Marco Dal Maschio, Emanuele Marconi, Giuseppe Ronzitti, Alessandro Maccione, Tommasso Fellin, Luca Berdondini, Evelina Chieregatti, Fabio Benfenati and Axel Blau
"Combined optical tweezers and laser dissector for controlled ablation of functional connections in neural networks"
J Biomed Opt. 2011 May; 16(5):051306

Aroshan K Jayasinghe, Jason Rohner and M Shane Hutson
"Holographic UV laser microsurgery"
Biomed. Opt. Express 2, 2590-2599 (2011)

M. Woerdemann , C. Alpmann and C. Denz
"Optical assembly of micro particles into highly ordered structures using Ince-Gaussian beams"
Appl. Phys. Lett. 98, 2011, 111101

Jing Bu, Guanghui Yuan, Yuyang Sun, Siwei Zhu and Xiaocong Yuan
"Optimization of computer-generated holograms for dynamic optical manipulation with uniform structured light spots"
Chin. Opt. Lett. 9, 061202-(2011)

Stefan M. Oehrlein, Jose R. Sanchez-Perez, R. B. Jacobson, Frank S. Flack, Ryan J. Kershner and Max G. Lagally
"Translation and manipulation of silicon nanomembranes using holographic optical tweezers"
Nanoscale Research Letters 2011, 6:507

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"Optical aberration compensation in a multiplexed optical trapping system"
J. Opt. 13 044008 doi: 10.1088/2040-8978/13/4/044008

Elisabeth R. Shanblatt and David G. Grier
"Extended and knotted optical traps in three dimensions"
Opt. Express 19, 5833-5838 (2011)

D. B. Phillips, D. M. Carberry, S.H. Simpson, H. Schäfer, M. Steinhart, R. Bowman, G. M. Gibson, M. J. Padgett, S. Hanna and M. J. Miles
"Optimizing the optical trapping stiffness of holographically trapped microrods using high-speed video tracking"
J. Opt. 13 044023

Yoshihiko Arita, Maria Leilani Torres-Mapa, Woei Ming Lee, Tomáš Čižmár, Paul Campbell, Frank J. Gunn-Moore and Kishan Dholakia
"Spatially optimized gene transfection by laser-induced breakdown of optically trapped nanoparticles"
Appl. Phys. Lett. 98,093702 (2011)

Čižmár, T., Brzobohatý, O., Dholakia, K. and Zemánek, P. (2011)
"The holographic optical micro-manipulation system based on counter-propagating beams"
Laser Physics Letters, 8: 50-56. doi: 10.1002/lapl.201010100

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Ryan A. Colyer, Giuseppe Scalia, Ivan Rech, Angelo Gulinatti, Massimo Ghioni, Sergio Cova, Shimon Weiss and Xavier Michalet
"High-throughput FCS using an LCOS spatial light modulator and an 8 × 1 SPAD array"
Biomedical Optics Express, Vol. 1 Issue 5, pp.1408-1431 (2010)

Antkowiak, M., Torres-Mapa, M. L., Gunn-Moore, F. and Dholakia, K.
"Application of dynamic diffractive optics for enhanced femtosecond laser based cell transfection"
Journal of Biophotonics, 3, 10-11, 696-705 (2010)

Eirini Papagiakoumou, Francesca Anselmi, Aurélien Bègue, Vincent de Sars, Jesper Glückstad, Ehud Y Isacoff and Valentina Emiliani
"Scanless two-photon excitation of channelrhodopsin-2"
Nature Methods, Volume 7, 848-854 (2010)

Tomáš Čižmár, Michael Mazilu and Kishan Dholakia
"In situ wavefront correction and its application to micromanipulation"
Nature Photonics (2010), doi:10.1038/nphoton.2010.85

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"Interactive Control of Holographic Optical Traps with Fast Hologram Generation"
Proceedings of IEEE International Symposium on Assembly and Manufacturing 2009, Suwon, Korea

Jörg Baumgartl, Gregor M. Hannappel, David J. Stevenson, Daniel Day, Min Gub and Kishan Dholakia
"Optical redistribution of microparticles and cells between microwells"
Supplementary Material (ESI) for Lab on a Chip, This journal is © The Royal Society of Chemistry 2009

2008

Graham M. Gibson, Jonathan Leach, Stephen Keen, Amanda J. Wright and Miles J. Padgett
"Measuring the accuracy of particle position and force in optical tweezers using high-speed video microscopy"
Optics Express, Vol. 16, Issue 19, pp. 14561-14570 (2008)

Structured Illumination, Laser Beam- and Pulseshaping

2013

Sandile Ngcobo, Igor Litvin, Liesl Burger and Andrew Forbes
"The digital laser"
arXiv:1301.4760

2012

Mary Ann Go, Christian Stricker, Steve Redman, Hans Bachor and Vincent R. Daria
"Patterned illumination for analyzing neuronal function in 3D"
Proc. of SPIE Vol. 8427 842703-1 (2012)

Yefeng Guan, Ori Katz, Eran Small, Jianying Zhou and Yaron Silberberg
"Polarization control of multiply-scattered light through random media by wavefront shaping"
arXiv:1206.3899 [physics.optics] (2012)

F. Difato, H. Tsushima, M. Pesce, A. Guiggiani, F. Benfenati, A. Blau, M. Basso, M. Vassalli and E. Chieregatti
"Axonal regeneration of cultured mouse hippocampal neurons studied by an optical nano-surgery system"
Proc. of SPIE Vol. 8207 820760-1 (2012)

Beatrix C. Hiesmayr and Wolfgang Löffler
"Complementarity Reveals Bound Entanglement of Two Twisted Photons"
arXiv:1212.5046v2

Thomas J. Huisman, Simon R. Huisman, Allard P. Mosk and Pepijn W. H. Pinkse
"Controlling single-photon Fock-state propagation through opaque scattering materials"
arXiv:1210.8388v1

Chenxi Huang, Hongxin Huang, Haruyoshi Toyoda, Takashi Inoue and Huafeng Liu
"Correlation matching method for high-precision position detection of optical vortex using Shack–Hartmann wavefront sensor"
Optics Express, Vol. 20, Issue 24, pp. 26099-26109 (2012)

H. I. C. Dalgarno, T. Čižmár, T. Vettenburg, J. Nylk, F. J. Gunn-Moore and K. Dholakia
"Wavefront corrected light sheet microscopy in turbid media"
Appl. Phys. Lett. 100, 191108 (2012)

Jochen Aulbach, Bergin Gjonaj, Patrick Johnson and Ad Lagendijk
"Spatiotemporal focusing in opaque scattering media by wave front shaping with nonlinear feedback"
Optics Express, Vol. 20, Issue 28, pp. 29237-29251 (2012)

Francesco Difato, Marco Dal Maschio, Riccardo Beltramo, Axel Blau, Fabio Benfenati and Tommaso Fellin
"Spatial Light Modulators for Complex Spatiotemporal Illumination of Neuronal Networks"
NeuromethodsVolume 67, 2012, pp 61-81

Stefan Eyring, Christian Kern, Michael Zürch and Christian Spielmann
"Improving high-order harmonic yield using wavefront-controlled ultrashort laser pulses"
Optics Express, Vol. 20, Issue 5, pp. 5601-5606 (2012)

N. Hermosa, C. Rosales-Guzmán and J. P. Torres
"Helico-conical optical beams self-heal"
arXiv:1211.5977

V. D. Salakhutdinov, E. R. Eliel and W. Loffler
"Full-Field Quantum Correlations of Spatially Entangled Photons"
PRL 108, 173604 (2012)

Emiliano Ronzitti, Marc Guillon, Vincent de Sars and Valentina Emiliani
"LCoS nematic SLM characterization and modeling for diffraction efficiency optimization, zero and ghost orders suppression"
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Naoya Matsumoto, Takashi Inoue, Taro Ando, Yu Takiguchi, Yoshiyuki Ohtake and Haruyoshi Toyoda
"High-quality generation of a multispot pattern using a spatial light modulator with adaptive feedback"
Optics Letters, Vol. 37, Issue 15, pp. 3135-3137 (2012)

Jung-Hoon Park, Chunghyun Park, Hyunseung Yu, Yong-Hoon Cho and YongKeun Park
"Dynamic active wave plate using random nanoparticles"
Optics Express, Vol. 20, Issue 15, pp. 17010-17016 (2012)

Shengmei Zhao, Longyan Gong, Yongqiang Li, Hua Yang, Yubo Sheng, Xiaoliang Dong and Fei Cao, Baoyu Zheng
"Experimental realization of large-alphabet quantum key distribution protocol using orbital angular momentum entanglement"
arXiv:1205.0851v1 (2012)

D. Giovannini, F. M. Miatto, J. Romero, S. M. Barnett, J. P. Woerdman and M. J. Padgett
"Determining the dimensionality of bipartite orbital-angular-momentum entanglement using multi-sector phase masks"
New J. Phys. 14 073046 (2012)

Moonseok Kim, Youngwoon Choi, Changhyeong Yoon, Wonjun Choi, Jaisoon Kim, Q-Han Park and Wonshik Choi
"Maximal energy transport through disordered media with the implementation of transmission eigenchannels"
Nature Photonics (2012) doi: 10.1038/nphoton.2012.159

P. S. Salter, A. Jesacher, J. B. Spring, B. J. Metcalf, N. Thomas-Peter, R. D. Simmonds, N. K. Langford, I. A. Walmsley and M. J. Booth
"Adaptive slit beam shaping for direct laser written waveguides"
Opt. Lett. 37, 470-472 (2012)

J. Leach, R. E. Warburton, D. G. Ireland, F. Izdebski, S. M. Barnett, A. M. Yao, G. S. Buller and M. J. Padgett
"Quantum correlations in position, momentum and intermediate bases for a full optical field of view"
Phys. Rev. A 85, 013827 (2012)

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W. Löffler, D. J. Broer and J. P. Woerdman
"Circular dichroism of cholesteric polymers and the orbital angular momentum of light"
PHYSICAL REVIEW A 83, 065801 (2011)

T. Čižmár, H. I. C. Dalgarno, P. C. Ashok, F. J. Gunn-Moore and K. Dholakia
"Interference-free superposition of nonzero order light modes: Functionalized optical landscapes"
Appl. Phys. Lett. 98, 081114 (2011)

Sandeep Tauro, Andrew Bañas, Darwin Palima and Jesper Glückstad
"Experimental demonstration of Generalized Phase Contrast based Gaussian beam-shaper"
Opt. Express 19, 7106-7111 (2011)

J. Strohaber, G. Kaya, N. Kaya, N. Hart, A. A. Kolomenskii, G. G. Paulus and H. A. Schuessler
"In situ tomography of femtosecond optical beams with a holographic knife-edge"
Opt. Express 19, 14321-14334 (2011)

Francesca Anselmia, Cathie Ventalona, Aurélien Bèguea, David Ogdenb and Valentina Emiliania
"IThree-dimensional imaging and photostimulation by remote-focusing and holographic light patterning"
PNAS November 9, 2011

J. Romero, J. Leach, B. Jack, M. R. Dennis, S. Franke-Arnold, S. M. Barnett and M. J. Padgett
"Entangled Optical Vortex Links"
Phys. Rev. Lett. 106, 100407 (2011)

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