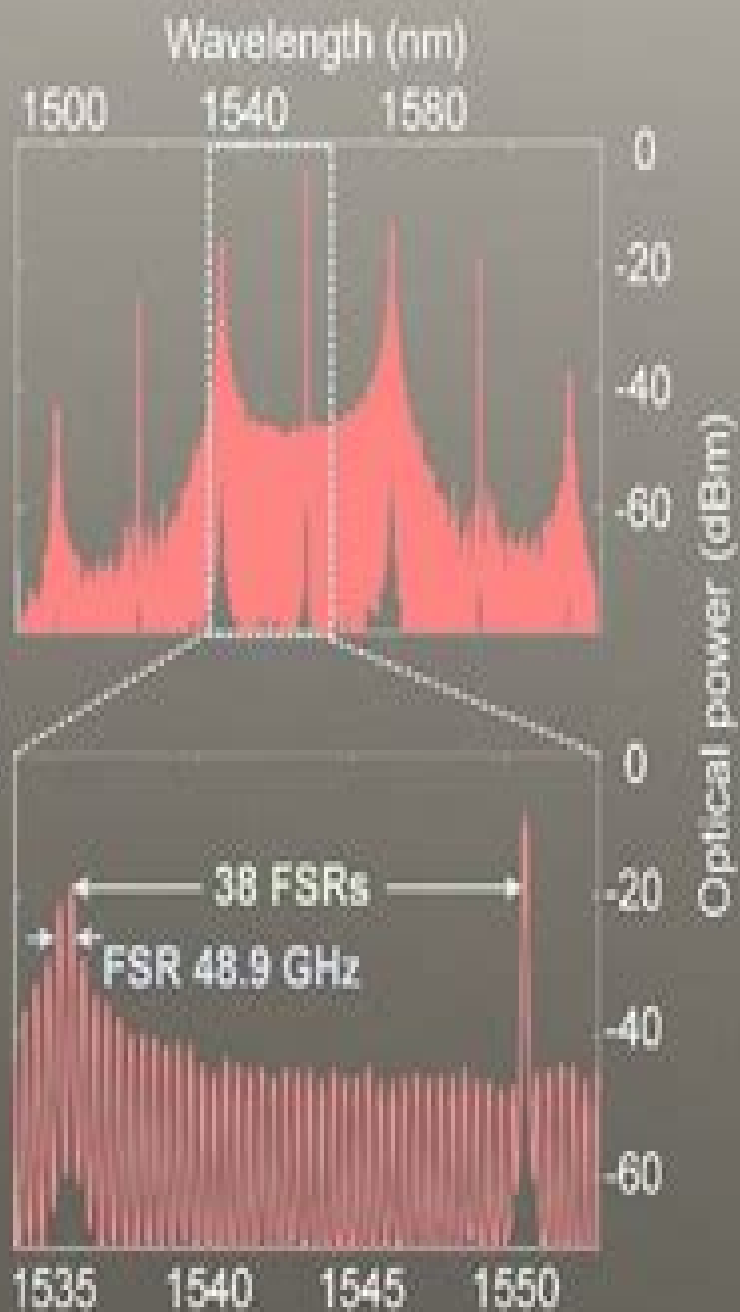
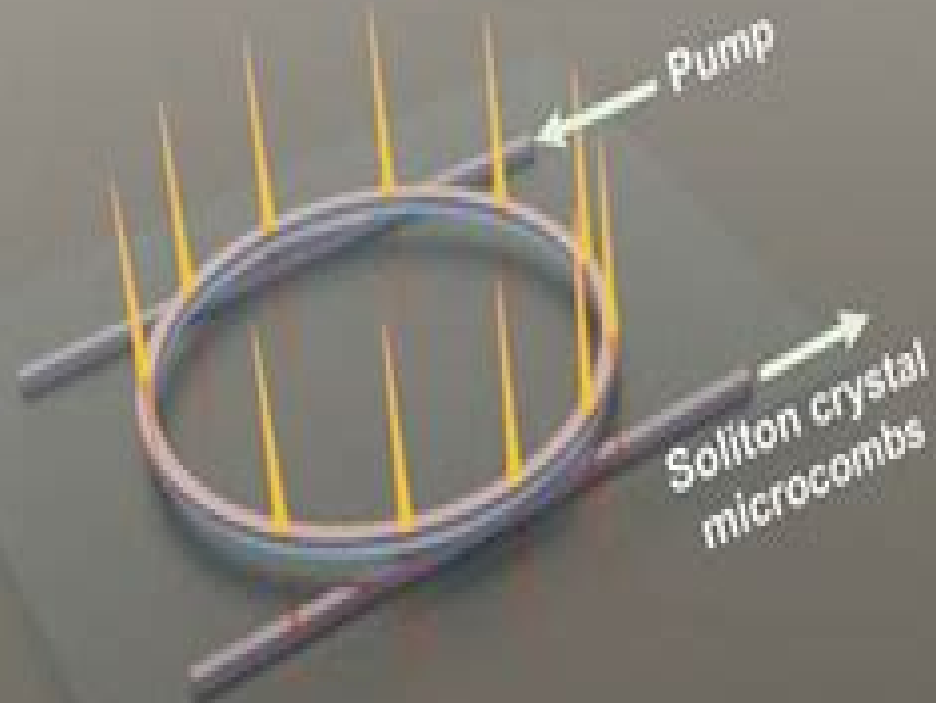




Applications Soliton Generated Optical Resonator

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Optical Soliton Communication Using Ultra-Short Pulses Iraj Sadegh Amiri, Harith Ahmad, 2015-05-07 This brief analyzes the characteristics of a microring resonator MRR to perform communication using ultra short soliton pulses The raising of nonlinear refractive indices coupling coefficients and radius of the single microring resonator leads to decrease in input power and round trips wherein the bifurcation occurs As a result bifurcation or chaos behaviors are seen at lower input power of 44 W where the nonlinear refractive index is $n_2 = 3.2 \times 10^{-20} \text{ m}^2/\text{W}$ Using a decimal convertor system these ultra short signals can be converted into quantum information Results show that multi solitons with FWHM and FSR of 10 pm and 600 pm can be generated respectively The multi optical soliton with FWHM and FSR of 325 pm and 880 nm can be incorporated with a time division multiple access TDMA system wherein the transportation of quantum information is performed Ring Resonator Systems to Perform Optical Communication Enhancement Using Soliton Iraj Sadegh Amiri, Abdolkarim

Afroozeh, 2014-08-27 The title explain new technique of secured and high capacity optical communication signals generation by using the micro and nano ring resonators The pulses are known as soliton pulses which are more secured due to having the properties of chaotic and dark soliton signals with ultra short bandwidth They have high capacity due to the fact that ring resonators are able to generate pulses in the form of solitons in multiples and train form These pulses generated by ring resonators are suitable in optical communication due to use the compact and integrated rings system easy to control flexibility less loss application in long distance communication and many other advantages Using these pulses overcome the problems such as losses during the propagation long distances error detection using many repeaters or amplifiers undetectable received signals pulse broadening overlapping and so on This book show how to generate soliton pulses using ring resonators in the micro and nano range which can be used in optical communication to improve the transmission technique and quality of received signals in networks such as WiFi and wireless communication **Soliton Coding for**

Secured Optical Communication Link Iraj Sadegh Amiri, Sayed Ehsan Alavi, Sevia Mahdaliza Idrus, 2014-07-24 Nonlinear behavior of light such as chaos can be observed during propagation of a laser beam inside the microring resonator MRR systems This Brief highlights the design of a system of MRRs to generate a series of logic codes An optical soliton is used to generate an entangled photon The ultra short soliton pulses provide the required communication signals to generate a pair of polarization entangled photons required for quantum keys In the frequency domain MRRs can be used to generate optical millimetre wave solitons with a broadband frequency of 0-100 GHz The soliton signals are multiplexed and modulated with the logic codes to transmit the data via a network system The soliton carriers play critical roles to transmit the data via an optical communication link and provide many applications in secured optical communications Therefore transmission of data information can be performed via a communication network using soliton pulse carriers A system known as optical multiplexer can be used to increase the channel capacity and security of the signals **Small Scale Optics** Preecha

Yupapin, Jalil Ali, 2013-08-28 The behavior of light in small scale optics or nano micro optical devices has shown promising results which can be used for basic and applied research especially in nanoelectronics Small Scale Optics presents the use of optical nonlinear behaviors for spins antennae and whispering gallery modes within micro nano devices and circuits which can *Integrated Micro-Ring Photonics* Iraj Sadegh Amiri, Abdolkarim Afroozeh, Harith Ahmad, 2016-12-08 Micro ring resonators MRRs are employed to generate signals used for optical communication applications where they can be integrated in a single system These structures are ideal candidates for very large scale integrated VLSI photonic circuits since they provide a wide range of optical signal processing functions while being ultra compact Soliton pulses have sufficient stability for preservation of their shape and velocity Technological progress in fields such as tunable narrow band laser systems multiple transmission and MRR systems constitute a base for the development of new transmission techniques Controlling the speed of a light signal has many potential applications in fiber optic communication and quantum computing The slow light effect has many important applications and is a key technology for all optical networks such as optical signal processing Generation of slow light in MRRs is based on the nonlinear optical fibers Slow light can be generated within the micro ring devices which will be able to be used with the mobile telephone Therefore the message can be kept encrypted via quantum cryptography Thus perfect security in a mobile telephone network is plausible This research study involves both numerical experiments and theoretical work based on MRRs for secured communication Comprehensive Materials Processing, 2014-04-07 Comprehensive Materials Processing Thirteen Volume Set provides students and professionals with a one stop resource consolidating and enhancing the literature of the materials processing and manufacturing universe It provides authoritative analysis of all processes technologies and techniques for converting industrial materials from a raw state into finished parts or products Assisting scientists and engineers in the selection design and use of materials whether in the lab or in industry it matches the adaptive complexity of emergent materials and processing technologies Extensive traditional article level academic discussion of core theories and applications is supplemented by applied case studies and advanced multimedia features Coverage encompasses the general categories of solidification powder deposition and deformation processing and includes discussion on plant and tool design analysis and characterization of processing techniques high temperatures studies and the influence of process scale on component characteristics and behavior Authored and reviewed by world class academic and industrial specialists in each subject field Practical tools such as integrated case studies user defined process schemata and multimedia modeling and functionality Maximizes research efficiency by collating the most important and established information in one place with integrated applets linking to relevant outside sources

Nanoscale Nonlinear PANDA Ring Resonator Preecha Yupapin, Chat Teeka, J. Ali, 2012-05-02 Microring nanoring resonator is an interesting device that has been widely studied and investigated by researchers from a variety of specializations This book begins with the basic background of linear and nonlinear ring resonators A novel design of nano

device known as a PANDA ring resonator is proposed The use of the device in the form of a PANDA in applications such as nanoelectronics measurement communication sensors optical and quantum computing drug delivery hybrid transistor and a new concept of electron hole pair is discussed in detail

Dissipative Solitons: From Optics to Biology and Medicine

Nail Akhmediev, Adrian Ankiewicz, 2008-08-26 The dissipative soliton concept is a fundamental extension of the concept of solitons in conservative and integrable systems It includes ideas from three major sources namely standard soliton theory developed since the 1960s nonlinear dynamics theory and Prigogine's ideas of systems far from equilibrium These three sources also correspond to the three component parts of this novel paradigm This book explains the above principles in detail and gives the reader various examples

Photonics and Nanotechnology Preecha Yupapin, 2008 Photonics and nanotechnology are popular emerging fields of technology This proceedings volume contains over 12 selected papers from the International Workshop and Conference on Photonics and Nanotechnology ICPN 2007 held in Pattaya Thailand from December 16-18 2007 The papers cover a wide range of topics from optical and nonlinear optical physics to nanoelectronics

Nonlinear Optical Systems Le Nguyen Binh, Dang Van Liet, 2012-03-05 Nonlinear Optical Systems Principles

Phenomena and Advanced Signal Processing is a simplified overview of the evolution of technology associated with nonlinear systems and advanced signal processing This book's coverage ranges from fundamentals to phenomena to the most cutting edge aspects of systems for next generation biomedical monitoring an

Issues in Optics, Light, Laser, Infrared, and

Photonic Technology: 2012 Edition, 2013-01-10 Issues in Optics Light Laser Infrared and Photonic Technology 2012

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Soliton-driven Photonics A.D. Boardman, A.P. Sukhorukov, 2012-12-06 It is ironic that the ideas of Newton which described a beam of light as a stream of particles made it difficult for him to explain things like thin film interference Yet these particles called photons have caused the adjective photonic to gain common usage when referring to optical phenomena The purist might argue that only when we are confronted by the particle nature of light should we use the word photonics Equally the argument goes on only when we are face to face with an integrable system i.e. one that possesses an infinite number of conserved quantities should we say soliton rather than solitary wave Scientists and engineers are pragmatic however and

they are happy to use the word soliton to describe what appears to be an excitation that is humped multi humped or localised long enough for some use to be made of it The fact that such solitons may stick to each other fuse upon collision is often something to celebrate for an application rather than just evidence that after all these are not really solitons in the classic sense Soliton therefore is a widely used term with the qualification that we are constantly looking out for deviant behaviour that draws our attention to its solitary wave character In the same spirit photonics is a useful generic cover all noun even when electromagnetic theory or optics would suffice

Dissipative Optical Solitons Mário F. S. Ferreira, 2022-09-23 This book introduces the basic concept of a dissipative soliton before going to explore recent theoretical and experimental results for various classes of dissipative optical solitons high energy dissipative solitons and their applications and mode locked fiber lasers A soliton is a concept which describes various physical phenomena ranging from solitary waves forming on water to ultrashort optical pulses propagating in an optical fiber While solitons are usually attributed to integrability in recent years the notion of a soliton has been extended to various systems which are not necessarily integrable Until now the main emphasis has been given to well known conservative soliton systems but new avenues of inquiry were opened when physicists realized that solitary waves did indeed exist in a wide range of non integrable and non conservative systems leading to the concept of so called dissipative optical solitons Dissipative optical solitons have many unique properties which differ from those of their conservative counterparts For example except for very few cases they form zero parameter families and their properties are completely determined by the external parameters of the optical system They can exist indefinitely in time as long as these parameters stay constant These features of dissipative solitons are highly desirable for several applications such as in line regeneration of optical data streams and generation of stable trains of laser pulses by mode locked cavities

Optical Processes in Microparticles and Nanostructures Ali Serpenguzel, Andrew W. Poon, 2011 This Festschrift is a tribute to the eminent scholar Professor Richard Kounai Chang on his retirement from Yale University on June 12 2008 During his over four decades of scientific exploration Professor Chang has made a lasting contribution to the development of linear and nonlinear optics and devices in confined geometries of surface second harmonic generation and surface enhanced Raman scattering and of novel methods for detecting airborne aerosol pathogens This volume assembles a collection of articles contributed by former students collaborators and colleagues of Professor Chang all over the world The topics span a diverse scope in applied optics frontiers many of which are rooted in Professor Chang's pioneering research

Simulation of Optical Soliton Control in Micro- and Nanoring Resonator Systems Suzairi Daud, Sevia Mahdaliza Idrus, Jalil Ali, 2015-03-17 This book introduces optical soliton control in micro and nanoring resonator systems It describes how the ring resonator systems can be optimized as optical tweezers for photodetection by controlling the input power ring radii and coupling coefficients of the systems Numerous arrangements and configurations of micro and nanoring resonator systems are explained The analytical formulation and optical transfer function for each model and the interaction of the

optical signals in the systems are discussed This book shows that the models designed are able to control the dynamical behaviour of generated signals **In Silico Engineering of Disulphide Bonds to Produce Stable Cellulase** Bahram Barati,Iraj Sadegh Amiri,2015-02-16 This Brief highlights different approaches used to create stable cellulase and its use in different fields Cellulase is an industrial enzyme with a broad range of significant applications in biofuel production and cellulosic waste management Cellulase 7a from *Trichoderma reesei* is the most efficient enzyme in the bio hydrolysis of cellulose In order to improve its thermal stability it can be engineered using a variety of approaches such as hydrophobic interactions aromatic interactions hydrogen bonds ion pairs and disulfide bridge creation *Nanophotonics* Preecha Yupapin,2013-05-07 This book investigates the behavior of light light pulse within the micro and nano scale device ring resonator which can be integrated to form the device circuits and systems that can be used for atom molecule trapping and transportation optical transistor fast calculation devices optical gate nanoscale communication and networks and **Issues in Optics, Light, Laser, Infrared, and Photonic Technology: 2011 Edition** ,2012-01-09 Issues in Optics Light Laser Infrared and Photonic Technology 2011 Edition is a ScholarlyEditions eBook that delivers timely authoritative and comprehensive information about Optics Light Laser Infrared and Photonic Technology The editors have built Issues in Optics Light Laser Infrared and Photonic Technology 2011 Edition on the vast information databases of ScholarlyNews You can expect the information about Optics Light Laser Infrared and Photonic Technology in this eBook to be deeper than what you can access anywhere else as well as consistently reliable authoritative informed and relevant The content of Issues in Optics Light Laser Infrared and Photonic Technology 2011 Edition has been produced by the world s leading scientists engineers analysts research institutions and companies All of the content is from peer reviewed sources and all of it is written assembled and edited by the editors at ScholarlyEditions and available exclusively from us You now have a source you can cite with authority confidence and credibility More information is available at [http www ScholarlyEditions com](http://www.ScholarlyEditions.com)

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Brambilla,2015-03-05 An in depth exploration of the dynamics of lasers and other relevant optical systems for graduate students and researchers

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