Optical Solitons Theoretical And Experimental Challenges 1st Edition

optical solitons - sccs - optical solitons an optical soliton is a pulse that travels without distortion due to dispersion or other e ects. they are a nonlinear phenomenon caused by self-phase modulation (spm), which means that the electric eld of the wave changes the index of refraction seen by the wave (kerr e ect). spm causes a red shift at the leading edge of the pulse. **optical solitons in the few-cycle regime: recent ...** - 4 optical solitons in the few-cycle regime: recent theoretical results 1257 moreover, by using the multiscale analysis, a generic kadomtsev-petviashvili evolution equation governing the propagation of femtosecond spatiotemporal optical solitons in quadratic nonlinear media beyond the svea was put forward [51]. **optical solitons and quasisolitons - university of arizona** - optical solitons and quasisolitons v. e. zakharov*) and e. a. kuznetsov†) l. d. landau institute of theoretical physics, russian academy of sciences, 117334 moscow, russia ~submitted 13 november 1997! zh. e´ksp. teor. fiz. 113, 1892–1914 ~may 1998! optical solitons and quasisolitons are investigated in reference to cherenkov radiation. it is **localized optical structures: an overview of recent ...** - localized optical structures, see several comprehensive reviews in these research areas [21–28] and other relevant works [29–43]. it may be anticipated that the optical solitons can play a key role in all-optical processing of information and in future ultra high speed optical networks. it is worth noting that **mathematical frontiers in optical solitons - pnas** - opments came together in 1973 with the theoretical prediction of temporal optical solitons (7), and their experimental realization in 1980 (8). it is easiest to describe an optical soliton in the spatial domain, where it is simply a self-guided wave. consider an optical beam as narrow as 10 optical wavelengths (5 microns for visible light). if **optical solitons in periodic structures - researchgate** - periodicity or discreteness leads to new families of optical solitons that have no counterpart whatsoever in continuous systems. in the first part of this dissertation, a theoretical investigation ... **an all-optical soliton fft computational arrangement in ...** - provide simulations of solitons propagation down the optical fibre in the 3nls equation domain and in general have been extensively used in theoretical research on col-liding solitons. these methods give the possibility not only of theoretical analysis and simulation of collisions between solitons but also of monitoring the stability and the ... **focus issue: optical solitons—perspectives and ...** - the history of solitons and the field of integrable systems, a brief overview of the development of nonlinear optics and optical solitons is provided. next, the various contributions to this focus issue are presented, and a few separate remarks are devoted to optical communications, where solitons **review article spatiotemporal optical solitons** - spatiotemporal optical solitons boris a malomed1,dumitrumihalache2,frankwise3 and lluis torner4 1 department of interdisciplinarystudies, school of electrical engineering, faculty of engineering, tel aviv university, tel aviv 69978, israel 2 department of theoretical physics, institute of atomic physics, po box mg-6, bucharest, romania **temporal evolution of the bright soliton in an optical fiber** - pacs. 42.81.dp – propagation, scattering, and losses; solitons. abstract. – the bright soliton in an optical fiber is generally studied by treating the spatial variable as the evolution variable, where the waveform is taken into consideration. to be consistent with the well-established picture of the dynamics of solitons in other systems, in **white-light solitons - mit** - optical spatial solitons made from incoherent white light were experimentally observed in 1997 by mitchell and segev [nature (london) 387, 880 (1997)]. we present what is believed to be the first theory describing these solitons and find the characteristic features of their spatiotemporal coherence properties and their **quasi-particle theory of optical soliton interaction** - the theoretical possibility of existence of optical solitons in a dielectric dispersive fiber was first predicted by hasegawa and kodama [12]. a couple of years later mollenauer et al. successfully performed the famous experiment to verify this prediction. important characteristic properties of these solitons are that they posses a **ultrashort spatiotemporal optical solitons in waveguide ...** - optical pulses in nonresonant media [40], and the maxwell–drude–bloch model of few-cycle optical solitons [41]. the theoretical and experimental researches in the broad area of nonlin-ear optics of ultrashort light pulses including few-cycle optical solitons have been reviewed in a series of papers [42–45]. **dynamics of spatial solitons in parity time symmetric ...** - dynamics of spatial solitons in parity-time-symmetric optical lattices: a selection of recent theoretical results ying-ji he1,*, xing zhu2, dumitru mihalache3,# 1guangdong polytechnic normal university, school of electronics and information, 510665 guangzhou, china **optical vortex solitons: experiment versus theory** - we present a brief overview of recent experimental and theoretical results on optical vortex solitons (in par-ticular, those recently obtained at the australian national university). special attention is paid to a direct comparison between the experimental data on the structure and motion of vortex solitons created as localized **spatial optical solitons in waveguide arrays - quantum ...** - spatial optical solitons in waveguide arrays andrey a. sukhorukov, yuri s. kivshar, hagai s. eisenberg, and yaron silberberg invited paper abstract— we overview theoretical and experimental ... **optical solitons for cascaded system: jacobi elliptic ...** - structure of both bright and dark solitons (10). in 1980, mollenauer et al. observed the structure of both bright and dark solitons were obtained by laboratory experi-ments (11). the optical soliton is described by the nlse which appears in various

areas of applied mathematics, theoretical physics and engineering. the optical solitons **on propagation of short pulses in strong dispersion ...** - on propagation of short pulses in strong dispersion managed optical lines v. e. zakharov and s. v. manakov landau institute of theoretical physics, russian academy of sciences, 117334 moscow, **high-precision optical measurement - vixra** - scientists develop new method of high-precision optical measurement an international collaborative of scientists has devised a method to control the number of optical solitons in microresonators, which underlie modern photonics. photonics is a dynamically developing field of modern physics. microresonators are basic structural **solitons in nonlinear lattices - arxiv** - b. solitons in models of photonic-crystal fibers 115 . 1. theoretical considerations 115 . 2. experiment: solitons in a liquid-infiltrated photonic-crystal fiber 117 . 3. the symmetry analysis 119 . c. discrete models 126 . d. solitons in a dissipative nonlinear lattice 128 . vi. surface solitons in nonlinear lattices 129 . a. **incoherent spatial optical solitons in ... - ictp** - however, incoherent optical solitons have also been experimentally observed in nonlinear media with instantaneous response and subsequently theoretical investigations have been carried out to understand their dynamics [4,5]. recently, piccanti et al. reported the first observation of incoherent solitons and their interactions in **counterpropagating optical beams and solitons** - ing solitons, because the beams bend together, whereas in cp solitons considerable theoretical expertise and experi-mental know-how is required to overcome these limitations in observing cp solitons interacting over extended propaga-tion distances [25,26]. nonetheless, it has been shown, for example, that by launching slanted beams symmetrically **interaction of spatial photorefractive solitons - qpal** - of their accessibility, screening solitons have also become a very useful tool in experimental verification of many theoretical predictions of general soliton theory, in particular, soliton collision. spatial solitons are ideally suited for application in all-optical beam switching and manipulation. **nonlinear pulse reshaping in optical fibers - intech** - nonlinear pulse reshaping in optical fibers 187 break-up effects in general restrict pulse propagation in an optical fiber, especially concerning the high-power pulses. however, in 1990s it was theoretically predicted that pulses with parabolic intensity profile and a linear frequency chirp can propagate without **modulation instability of perturbative nonlinear ...** - modulation instability of perturbative nonlinear schrodinger¨ ... the case of optical solitons, when femtosecond pulses are con- ... a. hasegawa in optical solitons-theoretical and experimental chal-lenges (eds. k. porsezian and v. c. kuriakose, springer verlag, berlin, 2003). **optical solitons in pt-symmetric potentials with competing ...** - symmetric optical systems in nonlinear regimes have been investigated extensively, and the key properties of diverse types of optical solitons, such as bright solitons, gap solitons, bragg solitons, gray or dark solitons and vortices that are supported by various complex pt-symmetric external potentials have been found [14–38]. we **collisions of dark solitons in optical fibers** - collisions of dark solitons in optical fibers r. n. thurston and andrew m. weiner bellcore, red bank, new jersey 07701-7040 received september 5, 1990; accepted september 27, 1990 we report numerical simulations that lay the groundwork for possible experiments aimed at the observation of dark soliton collisions. **solitons in soi optical waveguides - m-hikari** - solitons in soi optical waveguides 771 have considered the tod effect on the soliton generation and propagation, differently from [30]. moreover, in our paper we have found the guidelines to appropriately design the waveguide cross-section, managing the tod-induced delay in correlation with the optical mode polarization. this last investigation is **optical solitons in a nonlinear fiber medium with higher ...** - were greatly supported by the experimental demonstration of optical solitons by mo llenauer et al. (8) in 1980. since then many theoretical and experimental works have been done to achieve a communication system based on optical solitons. the solitons, localized-in-timeoptical pulses,evolve froma nonlinear change inthe refractive **optical solitons in the few-cycle regime: recent ...** - optical solitons in the few-cycle regime: recent theoretical results . h. leblond. 1, d. mihalache. 2. 1. laboratoire de photonique d'angers, ea 4464, université d'angers, 2 bd lavoisier, f-49000 **optical solitons with fourth order dispersion and dual ...** - optical solitons with fourth order dispersion and dual-power law nonlinearity anjan biswas1∕, daniela milovic2 1center for research and education in optical sciences and applications department of applied mathematics and theoretical physics delaware state university dover, de 19901-2277 usa **generation of multiple-charged optical vortex solitons in ...** - in the past, the considerable theoretical and experimental interest in the optical dark spatial solitons ~dsss! was in-spired not only by the intriguing physical picture presented @1#, but also by the possible applications in all-optical guid-ing and switching devices @2,3#. the only known truly two-dimensional ~2d! dsss are the optical vortex ... **an investigation on fiber optical soliton in mathematical ...** - optical soliton in media with quadratic nonlinearity and frequency dispersion are theoretically analyzed over the years. our aim is to discuss the behavior of soliton solutions to the kdv equation and their interactions and applications are then investigated in the fiber optics solitons theory in communication engineering. **stable spinning optical solitons in two and three dimensions** - department of theoretical physics, institute of atomic physics, po box mg-6, bucharest, romania a brief overview of recent results in the field of multidimensional spinning (vortex) optical solitons is given. we address the stability problem of two- and three-dimensional spinning solitons in media with competing nonlinearities. we conclude that **optical solitons in pt - arxiv** - optical solitons in pt-symmetric nonlinear couplers with gain and loss n v alexeeva, i v barashenkov,yandrey a sukhorukov, and yuri s kivshar nonlinear physics centre, australian national university, canberra act 0200, australia we study spatial and temporal

solitons in the ptsymmetric coupler with gain in one waveguide and loss in the other. **variational approach to dynamics of bright solitons in ...** - this theoretical model predicts optical soliton oscillations in lossy fibers. 2000 mathematics subject classification: 34a25, 35a15, 35q55, 37k40, 78a60. 1. introduction. the propagation of bright solitons in birefringent optical fibers has been the subject of intensive theoretical and experimental investiga-tions during the past two decades. **dark optical solitons with finite-width background pulses** - dark optical solitons with finite-width background pulses w. j. tomlinson bellcore, red bank, new jersey 07701-7040 ... optical solitons in fibers are pulses that propagate without ... not been considered in previous theoretical studies of dark solitons.2'4 in this paper we present the results of numerical **solitons and optical communications nlo term paper** - solitons and optical communications nlo term paper pablo alejandro reyes lizana december, 2008 1. 1 introduction in 1973 hasegawa and tappert1 proved the existence of optical solitons in a lossless ber. solitons are highly stable light pulses, and thus are very suitable for use in ... and theoretical research is being done in the eld. the use ... **optical soliton - vixra** - optical soliton applied scientists led by caltech's kerry vahala have discovered a new type of optical soliton wave that travels in the wake of other soliton waves, hitching a ride on and feeding off of the energy of the other wave. [17] physicists from trinity college dublin's school of physics and the crann **temporal solitons and pulse compression in photonic ...** - in this article, we demonstrate the first experimental observations of optical solitons and pulse compression in ~1-mm-long photonic crystal waveguides. suppression of two-photon absorption in the gainp material is crucial to these observations. compression of 3-ps pulses to a minimum duration of 580 fs with a simultaneously low pulse energy of **statics, dynamics, and manipulations of bright matter-wave ...** - respectively. very recently, bright solitons of the gap type, predicted in repulsive condensates f4g, have been created in the experiment f5g. theoretical predictions concerning a pos-sibility of the existence of stable multi-dimensional solitons supported by a full f4,6g or low-dimensionalf7g optical lat-tice sold have also been reported. **gap solitons: an introduction - physics & astronomy** - gap solitons: an introduction amarin ratanavis department of physics and astronomy, university of new mexico may 5,2005 gap solitons refer to intense nonlinear optical pulse propagation in periodic variation fiber. this paper is a brief survey and updates some of recent research in gap solitons. the theory of gap solitons by **optical solitons with polynomial and triple-power law ...** - the theory of optical solitons is one of the most progressive areas of research in applied and theoretical physics [1-32]. this research has lead to several overwhelming and interesting results. the most commonly studied aspects of optical solitons are conservation laws, birefringent fibers, dense wavelength-division **optical solitons in nematic liquid crystals: arbitrary ...** - consistent with the experimental observation of stable optical solitons [19]. partial theoretical explanations of this e ect, and related models are dis-cussed in [2, 22, 15]. the corresponding mathematical results include global well-posedness for arbitrary h1 initial data and existence of energy minimiz- **editorial on dissipative optical solitons - link.springer** - editorial on dissipative optical solitons r. kuszelewicza, s. barbay, g. tissoni, and g. almuneau laboratoire de photonique et de nanostructures, route de nozay, 91460 marcoussis, france received 13 may 2010 published online 18 june 2010 the fundamental mechanism that defines the concept of an optical soliton is the exact balance between two oppo- **optical spatial solitons: historical perspectives ...** - the number of papers dealing with spatial solitons has risen meteorically in the 1990s, still dominated by theoretical work. as in any other area, there have been certain key ideas and ex-periments that have defined this field and the directions that it has taken. in this paper, we discuss a selection of such papers and their significance. **interchannel interaction of optical solitons - cnlsnl** - interchannel interaction of optical solitons avner peleg, misha chertkov, and ildar gabitov theoretical division, lanl, los alamos, new mexico 87545, usa ~received 26 december 2002; published 15 august 2003! we study interaction between two solitons from different frequency channels propagating in an optical fiber. **communications in theoretical physics electromagnetism ...** - an optical fiber is anomalous a constant amplitude con-tinuous wave is unstable due to the modulational instabil-ity and breaks down into a sequence of localized pulses. these pulses are bright solitons. in the case of normal group-velocity dispersion in fibers, bright solitons do not exist. instead, initial pulses undergo enhanced dispersion **formation of discrete solitons in light-induced photonic ...** - arrays established with optical induction, either via coherent beam interference [7-9] or via amplitude modulation of a partially coherent beam [10, 11]. meanwhile, in addition to fundamental discrete solitons, vortex discrete solitons have also been predicted theoretically [12, 13] and demonstrated experimentally [14, 15]. **theory and measurement of the soliton self-frequency shift ...** - theory and measurement of the soliton self-frequency shift and efficiency in optical microcavities xu yi,† qi-fan yang,† ki youl yang, and kerry vahala* t. j. watson laboratory of applied physics, california institute of technology, pasadena, california 91125, usa

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