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WA 8:00 am–10:30 am
Highland A–K

Symposium on Solitons: 2
Alan F. Evans, *Corning Inc., Presider*

WA1 (Invited) 8:00 am

Modeling of soliton WDM systems with sliding filters, E. A. Golovchenko, *University of Maryland Baltimore County, Computer Science and Electrical Engineering Department, 5401 Wilke ns Avenue, TRC Room 201C, Baltimore, MD 21228-5398. E-mail: golovche@umbc.edu.* The purpose of the filters in a soliton communication line is to control the pulse frequency. Filters with a periodic transmission function can be naturally combined with WDM. However, filter characteristics impose certain limits on system performance. Issues such as preference in the frequency direction of sliding, channel separation, and dispersion maps in filtered soliton transmission will be discussed in detail.

WA2 8:30 am

Timing jitter calculations and control in high-speed soliton communication systems, Rene-Jean Essiambre, Govind P. Agrawal, *The Institute of Optics, University of Rochester, Rochester, NY 14627. E-mail: gpa@optics.rochester.edu.* Timing jitter of high-speed soliton communication systems is analyzed by taking into account the Raman effect and third-order dispersion. The Raman contribution dominates over the Gordon–Haus jitter for soliton widths below 5 ps, but can be decreased substantially by use of periodic optical phase conjugation.

WA3 8:45 am

Analytical and numerical study of timing jitter in soliton communication systems, Armando Humberto Pinto, A. Nolasco Pinto, Govind P. Agrawal,* J. Ferreira da Rocha, *Department of Electronic and Telecommunications, University of Aveiro, 3810 Aveiro, Portugal. E-mail: anp@ua.pt.* Timing jitter in soliton communication systems is studied numerically including both soliton interaction and amplifier noise. Deviations from the Gordon–Haus jitter for closely spaced solitons are compared with previous work. A new simple analytical model for the timing jitter is also proposed.
**University of Rochester.*

WA4 9:00 am

Bound polarized solitons in birefringent fibers, Y. N. Kondrat'ev, L. Nesterov, D. A. Nolan,* *S. I. Vavilov State Optical Institute 19371, Babushkin str., 36-1, St. Petersburg, Russia.* Correct analytic solutions describing the periodic oscillations of two bound polarized solitons, for the cases of small and large amplitudes of oscillations, are obtained. The basic characteristics of the oscillating solitons are determined. The criterion is derived that allows one to calculate the threshold for soliton oscillations in birefringent fibers.
**Corning Inc.*

WA5 9:15 am

Soliton Raman self-frequency shift in communication fibers with randomly varying birefringence, E. A. Golovchenko, A. N. Pilipetskii, D. Wang, C. R. Menyuk, *University of Maryland Baltimore County, Department of Computer Science and Electrical Engineering, 5401 Wilkens Avenue, TRC 201, Baltimore, MD 21228-5398. E-mail: golovche@umbc7.umbc.edu.* We derived the averaged propagation equations for a soliton in a fiber with randomly varying birefringence including the Raman effect. We will discuss the effect of the parallel and orthogonal Raman susceptibility components on the self-frequency shift. Computer modeling proves the validity of the averaged set of equations.

WA6 9:30 am

Vector soliton solutions and their stability, J. J. Li, J. Theimer,* I. Gabitov, J. W. Haus,* G. Kovacic, *Department of Mathematical Sciences, Rensselaer Polytechnic Institute, Troy, NY 12180-3590. E-mail: hausjj@rpi.edu.* We generate solutions of the vector nonlinear Schroedinger equation using several analytical techniques. The stability of the solutions is investigated analytically and numerically. Stable pulse train solutions of the equations are identified numerically and studied.
**Rome Laboratory; **Rensselaer Polytechnic Institute.*

WA7 9:45 am

Averaged equations for vector pulse propagation, I. Gabitov, J. W. Haus,* G. Kovacic, J. J. Li, *Department of Mathematical Sciences, Rensselaer Polytechnic Institute, Troy, NY 12180-3590. E-mail: hausjj@rpi.edu.* A multiple scales reduction technique is applied to obtain averaged equations and corrections for pulse propagation in fiber systems. The corrections are important in determining the stability of the solutions. We find a new length scale, which is identified with the interaction between two solitons.
**Department of Physics.*

WA8 10:00 am

Solitons with fourth-order dispersion, Michel Piché, Jean-François Cormier, Xiaonong Zhu, *Université Laval, Dép. Physique (COPL), Pavillon Vachon, Québec, Canada G1K 7P4. E-mail: mpiche@phy.ulaval.ca.* We have found an analytical solution to the generalized nonlinear Schrödinger equation with fourth-order dispersion. The solution is a bright soliton expressed as the square of an hyperbolic secant. That soliton is stable with respect to a weak third-order dispersion. The soliton evolves into a chirped solitary wave in presence of gain dispersion. We will show experimental measurements made with a sub-20 fs laser in agreement with these solutions.

WA9 10:15 am

Bright-dark pair and dark-dark pair soliton pulses in birefringent fibers, Yijiang Chen, *Australian National University, Optical Sciences Centre, Australian National University, Canberra, Australia ACT 0200. E-mail: cyj124 @rsphy3.anu.edu.au.* We consider propagation of bright-dark pair and dark-dark pair soliton pulses in birefringent fibers. We find that dark-dark pair soliton pulse can propagate stably, in contrast to its spatial counterpart, which disintegrates during evolution as a result of modulation instability of its backgrounds. On the other hand, the bright-dark pair soliton pulse is found to be unstable and the instability may lead to emission of bright and gray solitons. Their applications will also be discussed.

WB 8:00 am–10:30 am
Highland B–J

Symposium on Low-Cost Optoelectronic Packaging
Barbara M. Foley, *Motorola Inc., Presider*

WB1 (Tutorial) 8:00 am

Optoelectronics packaging, Albert Benzoni, Felix C. Anigbo, *AT&T Bell Laboratories.* Packaging options of optoelectronic devices for communication operating at data rates of 100 Mbit/s up to 10 Gbit/s will be reviewed. We will examine how the various choices of packaging material and design, electrical interconnect and optical design affect plastic frame packages and