International Journal of Optics

Special Issue on

Solitons, Rogons, and Other Localized Self-Similar Pulses in Optical Communication: Applications and Management

CALL FOR PAPERS

Self-similar waves such as solitons, kinks, breathers, rogue waves, and instantons have attracted significant attention as they are capable of transmitting high intensity signals through nonlinear fibers/waveguides. They have been experimentally realized in various optical fibers and waveguides like photonic crystal fibers, erbium doped fibers, optical metamaterials, and tapered graded-index waveguides, which has opened the flood gates for their use in digital communication. These nonlinear optical systems are well described by a set of nonlinear evolution equations. The dynamical behavior of the pulses as they propagate through various nonlinear media can be understood by obtaining and analyzing the solutions of these nonlinear equations with variable coefficients. The localized self-similar pulse solutions of these equations are of great importance as they change their width, amplitude, and so forth in accordance with the system parameters. The freedom of management of these pulses leads to potential applications in designing optical devices with high efficiency, logic gates, soliton switches, supercontinuum generation in a fiber, and so forth. Additionally, the existence of attosecond self-similar pulses has been analytically reported in nonlinear optical fibers. They provide the finest temporal resolution currently possible and can find applications in ultrafast fiber lasers.

To shed light on the utility of these pulses in nonlinear optics, this special issue aims to discuss their management, stability, and applicability in various nonlinear optical systems analytically, numerically, or experimentally. Therefore, we are welcoming research and review articles which deal with nonlinear optical systems. This collection of high quality review articles in this special issue will help the readers in developing a better understanding of the nonlinear systems and will help in designing optical devices with high efficiency at a lower cost.

Potential topics include but are not limited to the following:

- Computational analysis and dynamical properties of the optical pulses' propagation in various nonlinear fibers/waveguides
- All-optical communication devices and systems, logic gates, and soliton switches
- Theoretical models describing the pulse propagation in various inhomogeneous fibers
- Dynamical properties of optical pulses through various nonlinear fibers/waveguides
- Solitary waves in negative index materials (optical metamaterials)
- Nonlinear tunneling of optical similaritons/rogons
- Photonic crystal fiber based optical sensors
- Stability of the occurrence of optical pulses in nonlinear fibers/waveguides
- Soliton management: compression and amplification
- Supercontinuum generation in photonic crystal fibers and optical fiber tapers

Authors can submit their manuscripts through the Manuscript Tracking System at https://mts.hindawi.com/submit/journals/ijo/plsp/.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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