



Solitons in Optical Fibers: Fundamentals and Applications

By Linn F. Mollenauer, James P. Gordon

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Solitons are waves that retain their form through obstacle and distance. Solitons can be found in hydrodynamics, nonlinear optics, plasma physics, and biology. Optical solitons are solitary light waves that hold their form over an expansive interval. Conservation of this form creates an effective model for long distance voice and data transmission.

The application of this principle is essential to the technology of wired communications. Optical solitons produce crystal clear phone calls cross-country and internationally. It is because of these that someone on the other end of the phone sounds 'in the next room.' It is also pertinent to high-speed network information transmittal.

Mollenauer and Gordon have written the only text that an engineer or graduate student will need to understand this foundation subject in optics.

*Written by Linn Mollenauer and James Gordon who are celebrated for applying optical solitons to telecommunications

*Combines mathematical developments with well-chosen practical examples and design formulas

*Extensive material on the basic physics of fiber optic transmission and its practical applications

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Editorial Review

From the Back Cover

Based on over 20 years of research, Drs. Mollenauer and Gordon have written an indispensable reference on solitons for the engineering and applied physics communities. Covering the soliton from both the theoretical and practical side, this book is at once a fundamental text and an extensive handbook of contemporary engineering practice.

As presented by the authors, the nonlinear Schrödinger equation and its component's actions and consequences are central to understanding of the soliton. The book develops from that foundation to include the technologically important dispersion-managed solitons and "dense WDM" (Wavelength division multiplexing), all made accessible by many graphs, real-world examples, and associated experimental data. The limiting factors provided by Amplifier Spontaneous Emission noise and Polarization Mode Dispersion are also thoroughly discussed. In short, the book contains all the industry professional or academic researcher needs for both fundamental understanding and practical system design.

KEY FEATURES

- *A handy ODE (Ordinary Differential Equation) "short-cut" for calculating the behavior of dispersion-managed solitons
- *Thorough discussion of soliton-soliton collisions in dense WDM
- *Techniques for: Generation and characterization of solitons; Measurement of fiber parameters; Dispersion management; Attainment of flat gain for dense WDM
- *A brief history of solitons

About the Author

By Dr. Linn F Mollenauer, J. P. Gordon and P. V. Mamyshev

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