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Nota di contenuto	Localized Waves; Contents; CONTRIBUTORS; PREFACE; Acknowledgments; 1 Localized Waves: A Historical and Scientific Introduction; 1.1 General Introduction; 1.2 More Detailed Information; 1.2.1 Localized Solutions; Appendix: Theoretical and Experimental History; Historical Recollections: Theory; X-Shaped Field Associated with a Superluminal Charge; A Glance at the Experimental State of the Art; References; 2 Structure of Nondiffracting Waves and Some Interesting Applications; 2.1 Introduction; 2.2 Spectral Structure of Localized Waves; 2.2.1 Generalized Bidirectional Decomposition 2.3 Space-Time Focusing of X-Shaped Pulses2.3.1 Focusing Effects Using Ordinary X-Waves; 2.4 Chirped Optical X-Type Pulses in Material Media; 2.4.1 Example: Chirped Optical X-Type Pulse in Bulk Fused Silica; 2.5 Modeling the Shape of Stationary Wave Fields: Frozen Waves; 2.5.1 Stationary Wave Fields with Arbitrary Longitudinal Shape in Lossless Media Obtained by Superposing Equal-Frequency Bessel Beams; 2.5.2 Stationary Wave Fields with Arbitrary Longitudinal Shape

in Absorbing Media: Extending the Method; References
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3.4 Modified Hybrid Spectral Representation and Its Application to the Derivation of Finite-Energy Pulsed Beams3.4.1 Modified Hybrid Spectral Representation; 3.4.2 (3 + 1)-Dimensional Splash Modes and Focused Pulsed Beams; 3.5 Conclusions; References; 4 Ultrasonic Imaging with Limited-Diffraction Beams; 4.1 Introduction; 4.2 Fundamentals of Limited-Diffraction Beams; 4.2.1 Bessel Beams; 4.2.2 Nonlinear Bessel Beams; 4.2.3 Frozen Waves; 4.2.4 X-Waves; 4.2.5 Obtaining Limited-Diffraction Beams with Variable Transformation; 4.2.6 Limited-Diffraction Solutions to the Klein-Gordon Equation
4.2.7 Limited-Diffraction Solutions to the Schrodinger Equation4.2.8 Electromagnetic X-Waves; 4.2.9 Limited-Diffraction Beams in Confined Spaces; 4.2.10 X-Wave Transformation; 4.2.11 Bowtie Limited-Diffraction Beams; 4.2.12 Limited-Diffraction Array Beams; 4.2.13 Computation with Limited-Diffraction Beams; 4.3 Applications of Limited-Diffraction Beams; 4.3.1 Medical Ultrasound Imaging; 4.3.2 Tissue Characterization (Identification); 4.3.3 High-Frame-Rate Imaging; 4.3.4 Two-Way Dynamic Focusing; 4.3.5 Medical Blood-Flow Measurements; 4.3.6 Nondestructive Evaluation of Materials
4.3.7 Optical Coherent Tomography

Sommario/riassunto

The first book on Localized Waves-a subject of phenomenal worldwide research with important applications from secure communications to medicine Localized waves-also known as non-diffractive waves-are beams and pulses capable of resisting diffraction and dispersion over long distances even in non-guiding media. Predicted to exist in the early 1970s and obtained theoretically and experimentally as solutions to the wave equations starting in 1992, localized waves now garner intense worldwide research with applications in all fields where a role is played by a wave equation, from electromagne