

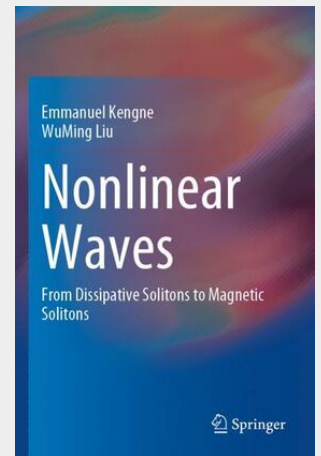
Liu / Kengne

## Nonlinear Waves

From Dissipative Solitons to Magnetic Solitons

This book highlights the methods to engineer dissipative and magnetic nonlinear waves propagating in nonlinear systems. In the first part of the book, the authors present methodologically mathematical models of nonlinear waves propagating in one- and two-dimensional nonlinear transmission networks without/with dissipative elements. Based on these models, the authors investigate the generation and the transmission of nonlinear modulated waves, in general, and solitary waves, in particular, in networks under consideration. In the second part of the book, the authors develop basic theoretical results for the dynamics matter-wave and magnetic-wave solitons of nonlinear systems and of Bose–Einstein condensates trapped in external potentials, combined with the time-modulated nonlinearity. The models treated here are based on one-, two-, and three-component non-autonomous Gross–Pitaevskii equations. Based on the Heisenberg model of spin–spin interactions, the authors also investigate the dynamics of magnetization in ferromagnet with or without spin-transfer torque. This research book is suitable for physicists, mathematicians, engineers, and graduate students in physics, mathematics, and network and information engineering.

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