

Nonlinear waves and solitons on contours and closed surfaces

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Abstrak

This volume is an introduction to nonlinear waves and soliton theory in the special environment of compact spaces such as closed curves and surfaces and other domain contours. It assumes familiarity with basic soliton theory and nonlinear dynamical systems. The first part of the book introduces the mathematical concepts required for treating the manifolds considered, providing relevant notions from topology and differential geometry. An introduction to the theory of motion of curves and surfaces - as part of the emerging field of contour dynamics, is given. The second and third parts discuss the modeling of various physical solitons on compact systems, such as filaments, loops and drops made of almost incompressible materials thereby intersecting with a large number of physical disciplines from hydrodynamics to compact object astrophysics.