



Solutions of Differential Equations in Nonlinear Water Waves

By Ehab S. Selima

LAP Lambert Academic Publishing Feb 2015, 2015. Taschenbuch. Condition: Neu. Neuware - This book is concerned with the study of nonlinear water waves, which is one of the important observable phenomena in Nature. This study is related to the fluid dynamics, in general, and to the oceans dynamics in particular. The solutions of nonlinear PDEs with constant and variable coefficients, which describe the wave motion of undulant bores in shallow water, are investigated by using various analytical methods to illustrate the relation between solitary and water waves. The important ideas and results for nonlinear dispersive properties and solitons, which originated from the investigations of water waves, are discussed. The stability analysis for the second order system of PDEs is studied by using the phase plane method. In addition, we use perturbation methods to study the water wave problems for an incompressible fluid under the acceleration gravity and surface tension. The conservation laws of some PDEs are established. We illustrate the resulting solutions in several 3D-graphics showing the shock and solitary wave nature in the flow. This book contains many concepts of water wave motion and different mathematical methods that help researchers in the relevant topics. 136 pp. Englisch.



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