



Numerical Treatment of Whitham-Broer-Kaup Shallow Water Model

By Mohammed Ismael Sadeeq

LAP Lambert Academic Publishing Apr 2017, 2017. Taschenbuch. Condition: Neu. Neuware - This research presents numerical solution of Whitham-Broer-Kaup (WBK) shallow water model using some finite difference methods such as the explicit, implicit, Crank-Nicolson, exponential, Richardson, and DuFort-Frankel methods. The local truncation errors and consistency are also studied for these methods. Furthermore, the radial basis function-pseudospectral method is successfully applied for solving WBK model numerically. In this method, the model is discretized in the space x which leads to a system of ordinary differential equations with independent variable time t . Then the forward Euler's and fourth-order Runge-Kutta methods used to solve this system of ordinary differential equations. Finally, two different problems are considered to illustrate the efficiency of the methods. A comparative study is made between the approximate solution obtained by the presented numerical methods and the exact solution. The MATLAB codes have been written for all methods as can be found in the appendix. 88 pp. Englisch.



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