The Modified Reductive Perturbation Method as Applied to the Boussinesq Equation

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In this work, we extended the application of "the modified reductive perturbation method" to long water waves and obtained the governing equations of Korteweg – de Vries (KdV) hierarchy. Seeking localized travelling wave solutions to these evolution equations we have determined the scale parameter g_1 so as to remove the possible secularities that might occur. To indicate the effectiveness and the elegance of the present method, we studied the problem of the "dressed solitary wave method" and obtained exactly the same result. The present method seems to be fairly simple and practical as compared to the renormalization method and the multiple scale expansion method existing in the current literature.

Key words: Modified Reductive Perturbation Method; Korteweg – de Vries Hierarchy; Solitary Waves.