Higher-Order Approximations for Symmetrical Regular Long Wave Equation

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In this work, we extend the application of "the modified reductive perturbation method" to the symmetrical regular long wave equation and try to obtain the contribution of higher-order terms in the perturbation expansion. It is shown that the lowest-order term in the expansion is governed by the nonlinear Schrödinger equation while the second- and third-order terms are governed by the linear Schrödinger equation. By employing the hyperbolic tangent method, progressive wave type solutions are obtained for the first-, second- and third-order terms in the perturbation expansion. – PACS numbers: 02.30.Jr, 42.25.Bs, 42.81.Dp, 43.35.Kp.

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