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应用改进的G/G展开法求ZS方程的精确解

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摘要:

应用改进的G/G展开法构造出Zhiber-Shabat(ZS)方程的20组精确解,这些解的类型主要包含双曲函数通解、三角函数通解和有理函数通解三种形式。对解的性质进行了相应分析,当对双曲函数通解中的参数取特殊值时,可以得到孤立波解。当对三角函数通解中的参数取特殊值时,可以得到对应的周期波函解。实践证明,应用改进的G/G'展开法能够得到方程一些新的精确解,扩大了解的范围。

关键词: 非线性方程 改进的G/G展开法 ZS方程 孤立波解 周期波解

Derivation of exact solutions for ZS equation with extended G/G expansion method

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Abstract:

Using the extended G/G' expansion method, the twenty group of exact solutions for ZS equation were constructed. As a result, the hyperbolic function solutions, trigonometric function solutions, and rational solutions with arbitrary parameters to the equation were obtained. When the arbitrary parameters in hyperbolic function solutions are taken as some special values, the solitary wave solutions can be obtained by analyzing the properties of solutions. When the arbitrary parameters in trigonometric function solutions are taken as some special values, the trigonometric function solutions can be expressed as periodic wave solutions. Some new exact solutions can be obtained by applications of improved G/G' expansion method with larger scope of the solutions.

Keywords: nonlinear equation extended G/G expansion method ZS equation solitary wave solutions periodic solution

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