

理论研究

二阶孤子的传输和相互作用

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收稿日期 修回日期 网络版发布日期 2008-3-20 接受日期

摘要 用分步傅里叶变换法求解二阶孤子传输的非线性薛定谔方程, 得到了在此条件下孤子传输的数值图形, 发现二阶孤子在传输中被压缩, 幅值振荡变化。2个二阶孤子在传输过程中没有出现象2个一阶孤子那样周期性碰撞, 但2个二阶孤子时间间隔较小时, 随传输距离在2个二阶孤子中间周期性地衍生出第3个孤子。研究证明: 二阶孤子的传输具有与一阶孤子明显不同的特征。

关键词 [二阶孤子](#) [非线性薛定谔方程](#) [分步傅里叶变换法](#)

分类号 [TN929.11](#)

Propagation and interaction of second-order solitons

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Abstract The propagation characteristics of second-order solitons were acquired by solving the nonlinear Schrodinger (NLS) equation with the method of step Fourier transform. The second-order solitons are compressed and their amplitude oscillates during the propagation. Periodic collision does not take place during propagation process of two second-order solitons. Two second order solitons will periodically yield a smaller soliton when their time-interval is small enough. It is concluded that the propagation characteristics of second order soliton are different from those of one-order soliton.

Key words [second-order soliton](#) [NLS equation](#) [method of step Fourier transform](#)

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