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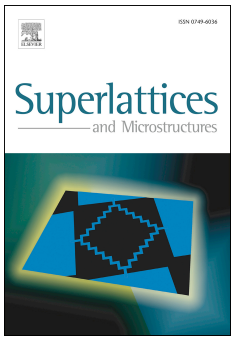

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Dynamics of Optical Solitons in Dual-Core Fibers via Two Integration Schemes

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Abstract

This article studies the dynamics of optical solitons in dual-core fibers with group velocity mismatch, group velocity dispersion and linear coupling coefficient under Kerr law nonlinearity via two integration schemes, namely, Q-function scheme and trial solution approach. The Q-function scheme extracts dark and singular 1-soliton solutions, along with the corresponding existence restriction. This scheme, however, fails to retrieve bright 1-soliton solution. Moreover, the trial solution approach extracts bright, dark and singular 1-soliton solutions. The constraint conditions, for the existence of the soliton solutions, are also listed. Additionally, a couple of other solutions known as singular periodic solutions, fall out as a by-product of this scheme. The obtained results have potential applications in the study of solitons based optical communication.

Keywords: Optical solitons, dual-core fibers, integrability.

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