

A new closed form solution to the quintic complex Ginzburg-Landau equation.

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09 March 2010

Abstract:

The quintic complex Ginzburg-Landau equation

$$iA_t + pA_{xx} + q|A|^2A + r|A|^4A - i\gamma A = 0, \quad \Im(p/r) \neq 0, \quad (p, q, r) \in \mathcal{C}, \quad \gamma \in \mathcal{R},$$

is not integrable, and very few closed form solutions are known [1–4] for its traveling wave reduction

$$A = \sqrt{M(\xi)}e^{i(-\omega t + \varphi(\xi))}, \quad \xi = x - ct.$$

In this work, exploiting the general method developed in [5,6], we obtain a new closed form solution, which contains one more arbitrary parameter than the elliptic solution presented in [4].

References:

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