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

Robert Conte$^{1,2}$ and Ng Tuen-wai$^2$

$^1$ LRC MESO, École normale supérieure de Cachan (CMLA) et CEA DAM
61, avenue du Président Wilson,
F–94235 Cachan Cedex, France.
E-mail: Robert.Conte@cea.fr

$^2$ Department of Mathematics, The University of Hong Kong, Pokfulam Road, Hong Kong.
E-mail: ntw@maths.hku.hk

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Abstract:

The quintic complex Ginzburg-Landau equation

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

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

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

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: