

## Nonlinear Sciences &gt; Exactly Solvable and Integrable Systems

# A mapping function approach applied to some classes of nonlinear equations

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In this work, we study some models of scalar fields in 1+1 dimensions with non-linear self-interactions. Here, we show how it is possible to extend the solutions recently reported in the literature for some classes of nonlinear equations like the nonlinear Klein-Gordon equation, the generalized Camassa-Holm and the Benjamin-Bona-Mahony equations. It is shown that the solutions obtained by Yomba [1], when using the so-called auxiliary equation method, can be reached by mapping them into some known nonlinear equations. This is achieved through a suitable sequence of translation and power-like transformations. Particularly, the parent-like equations used here are the ones for the  $\lambda \phi^4$  model and the Weierstrass equation. This last one, allow us to get oscillating solutions for the models under analysis. We also systematize the approach in order to show how to get a larger class of nonlinear equations which, as far as we know, were not taken into account in the literature up to now.

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