

New and more dual-mode solitary wave solutions for the Kraenkel-Manna-Merle system incorporating fractal effects

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Abstract

This paper introduces the fractal Kraenkel-Manna-Merle (KMM) system, that explains nonlinear short wave propagation with zero conductivity for saturated ferromagnetic materials in an external field. The semi inverse technique and the new auxiliary equation method (NAEM) are used to generate a new set of solutions. The proposed methods are more straightforward, succinct, accurate, and simple to calculate dual mode solitary wave solutions. A collection of exact soliton solutions specifically bright, dark, singular-shaped and singular-periodic are generated. The estimated solutions are obtained using constraint conditions and are displayed through 2D, 3D and contour plots with appropriate parametric values. The arbitrary functions in the solutions are chosen as unique functions to generate some novel soliton structures.

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semi inverse.pdf available at <https://authorea.com/users/416429/articles/523980-new-and-more-dual-mode-solitary-wave-solutions-for-the-kraenkel-manna-merle-system-incorporating-fractal-effects>