Qeios

Peer Review

Review of: "Multidimensional Soliton Systems: an Update"

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The author provided an update on the recently published work on multidimensional solitons. It offers a compact outline of the directions of the current experimental and theoretical work in this and related fields. The update of theoretical results includes the analysis of 2D solitons in the optical system with quadratic nonlinearity and *fractional diffraction*, and the prediction of stable 3D vortex solitons in various BEC schemes with long-range interactions. Once all the corrections and suggestions have been considered, it is suggested that this document be accepted.

1. Please check the manuscript for grammar, spelling, punctuation, and spacing errors.
2. The abstract needs to be improved to effectively highlight the novelty of the work and its key points of analysis.
3. Discuss the research gap of the study and highlight the main novelty of this paper and the significance of the results.
4. Soliton solutions are essential to study solitary waves, lumps, periodic waves, and others, as shown in recent works 10.1007/s11071-024-10792-8, 10.1007/s11071-024-10645-4, and 10.1088/1402-4896/ad7cd9.
5. Enhance the introduction and concisely present it using novel nonlinear PDEs and techniques, such as those found in 10.1016/j.cjph.2024.09.004, 10.1007/s11071-023-08938-1, 10.1016/j.padiff.2022.100274, 10.1007/s11071-023-08683-5. Nonlinear waves are crucial in understanding the nonlinear behavior of evolution equations through singularities; a further literature review is needed.
6. Update the conclusion by discussing the novelty and findings without ambiguity in the abstract.

doi.org/10.32388/48GEGM

Declarations

Potential competing interests: No potential competing interests to declare.