Numerical solution of 1D Nonlinear Schrödinger Equation for femtosecond laser pulse

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Abstract

The 1D Nonlinear Schrödinger Equation (NLSE) has been employed to model the femtosecond laser pulse propagation in photonic crystals. A numerical scheme has been used to solve NLSE. Using the constructed neural network machine learning model and applying various values of time, space coordinates and applying the proper artificial boundary conditions, we have concluded that our results are close to other numerical schemes. The employed machine learning model can be applied to solve the aforementioned NLSE faster compared to other algorithms. Lastly, several numerical tests are performed to analyze the capacity of the proposed numerical scheme.

1. Introduction

2. Materials and Methods

3. Results

4. Conclusions

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References

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