

Boosting Soliton Propagation with Graphics Processing Units

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Massively parallel computing using Graphics Processing Units (GPUs) can be very effective for the speedup of the solution of numerically intensive problems. In particular, efficient algorithms for studying the field dynamics under models of the Nonlinear Schrödinger Equation type that rely on the use of Fast Fourier Transforms (FFTs) are very well suited for GPU hardware acceleration. We will present results of numerical investigations on propagation problems in nonlinear optical media using GPU-accelerated FFT-based algorithms. The analyses range from nonparaxial beam propagation methods [1, 2] that have supported extensive analytical and numerical research on Helmholtz solitons to a novel family of highly efficient numerical schemes [3].

References

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