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## **Numerical simulations for 1+2 dimensional coupled nonlinear Schrödinger type equations**

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### **Abstract**

The coupled nonlinear Schrödinger equation is of tremendous importance in both theory and applications. Coupled nonlinear Schrödinger equation (CNLS) is the vectorial version of the nonlinear Schrödinger equation (NLS). The NLS equation is the main governing equation in the area of optical solitons. In this paper, we perform numerical simulations of two dimensional CNLS equation using the finite difference methods: a) the Explicit Finite Difference method and b) the Implicit Finite Difference method (Alternating Directions Implicit method). The methods are implemented. Our preliminary numerical results have shown that these methods give good results.

*Key words:* Parallel Algorithms, MPI, Finite Difference.