

## **Multistep reduced differential transform method in solving nonlinear Schrodinger equations**

### **ABSTRACT**

This paper obtains semi-analytical solutions for the nonlinear Schrodinger equations (NLSEs) using the multistep reduced differential transform method (MsRDTM). The implemented method yields an analytical approximate solution over a longer time frame, in which the method applied is treated as an algorithm in a sequence of small sub-division of intervals of identical length compared to the traditional reduced differential transform method (RDTM). Excluding the need of perturbation, linearization, or discretization, this method offers the benefit and reliability of the multistep algorithm. The outcomes show that the MsRDTM generated highly accurate solutions of NLSEs than the RDTM. In addition, the results show that the suggested method is straightforward to use, saves a significant amount of computing work when solving NLSEs, and has potential for broad application in other complex partial differential equations (PDEs) in the fields of engineering and science. The accuracy of the method is shown through the tables and graphical illustrations provided.