

Summary: In this article, the variable-order (VO) time fractional 2D Kuramoto-Sivashinsky equation is introduced, and a semidiscrete approach is presented through 2D Chebyshev cardinal functions (CCFs) for solving this equation. In the proposed method, we obtain a recurrent algorithm by using the finite difference method to approximate the VO fractional differentiation, the weighted finite difference method with parameter $\theta$, and the approximation of the unknown function by the 2D CCFs. The differentiation operational matrices and the collocation technique are used to extract a linear system of algebraic equations which can be easily solved. The credibility of the developed method is examined on three numerical examples.

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