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Harish Bhatt*, 800 W University Pkwy, Orem, UT 84058. *Fast and stable higher-order method in application to multi-dimensional space fractional reaction-diffusion equations.*

In this talk, we will introduce a fast and stable higher-order method for solving high-dimensional space fractional reaction-diffusion equations. The proposed method is explicit in nature and utilizes the fourth-order compact finite difference scheme and matrix transfer technique in space with FFT-based implementation. Time integration is done through the modified fourth-order exponential time differencing Runge-Kutta scheme. In order to demonstrate the accuracy, efficiency, and stability of the proposed scheme, a set of numerical experiments are carried out on high-dimensional space fractional reaction-diffusion equations including two-dimensional (2D) Fitzhugh-Nagumo, Allen-Cahn, Gierer-Meinhardt, Gray-Scott and three-dimensional (3D) Schnakenberg models will be discussed (Received January 19, 2021)