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Solution of Nonlinear Brusselator Model by a Combined Sawi Transform and Homotopy Analysis Method

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The Brusselator is a theoretical model for a type of autocatalytic reaction to analyze the behaviour of the chemical systems with non-linear oscillator. Fractional-order Brusselator system of equations (Reaction-Diffusion system) were solved using Sawi Homotopy Analysis Method (SHAM) which is a combination of Sawi transform and Homotopy analysis method. Obtained results were compared with the results in the literature and it was deduced that the mean absolute error (MAE) obtained by SHAM were smaller compared to the solution in the literature. The compiled findings showed the efficacy of the implemented technique and hence recommended for solving fractional-order nonlinear partial differential equations. (within the domains of applied sciences, engineering and technology).

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