

Fully discrete Crank-Nicolson finite element methods for a stochastic Keller-Segel chemotaxis system

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In this talk, I will present recent advances in the numerical analysis of a stochastic Keller–Segel system perturbed by Stratonovich noise, which models chemotaxis movement in a randomly fluctuating environment. To discretize the system, we employ the Crank–Nicolson method for time discretization and a splitting mixed finite element method for spatial discretization. We establish several stability estimates and derive convergence rates for the proposed numerical scheme. Numerical experiments are conducted to validate the theoretical findings and to illustrate the effectiveness of the method.

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