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Titre

MATHEMATICAL AND NUMERICAL ANALYSIS FOR A REACTION-DIFFUSION SYSTEM WITH NONLOCAL AND CROSS DIFFUSION

Abstract : In this talk, We provide existence results for nonnegative solutions to a class of reaction-diffusion systems with nonlocal and cross diffusion describing interacting species. The existence of weak solutions is proved by means of an approximation process, the Faedo-Galerkin method, and a compactness argument.Moreover, we propose a semiimplicit finite volume scheme for this system, we establish existence and uniqueness of the discrete solution, and it is also showed that the discrete solution generated by the given schème converges to the corresponding weak solution for the model studied. The convergence proof is based on the use of the discrete Sobolev embedding inequalities with general boundary conditions and a space-time L1 compactness argument that mimics the compactness lemma due to S. N. Kruzhkov. Finally we give some numerical examples.