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Mathematical and Numerical Analysis of a Reaction Diffusion System of Lambda-Omega Type

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Abstract : In this study we consider a nonlinear in time finite element approximation of a reaction diffusion system of lambda-omega type. We use a fixed point theorem to prove existence of the approximations. Then, we derive some essential stability estimates and discuss the uniqueness of the approximations. Also, we prove an optimal error bound in time for d=1, 2 and 3 space dimensions. Finally, we present some numerical experiments to verify the theoretical results.

Keywords : reaction diffusion system, finite element approximation, fixed point theorem, an optimal error bound
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