World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:8, No:08, 2014

Mathematical and Numerical Analysis of a Nonlinear Cross Diffusion System

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Abstract : We consider a nonlinear parabolic cross diffusion model arising in applied mathematics. A fully practical piecewise linear finite element approximation of the model is studied. By using entropy-type inequalities and compactness arguments, existence of a global weak solution is proved. Providing further regularity of the solution of the model, some uniqueness results and error estimates are established. Finally, some numerical experiments are performed.

Keywords : cross diffusion model, entropy-type inequality, finite element approximation, numerical analysis
Conference Title : ICMCS 2014 : International Conference on Mathematics and Computational Science
Conference Location : London, United Kingdom
Conference Dates : August 21-22, 2014