Acerca de la formación de patrones de Turing bajo consideraciones probabilisticas [

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Analítica

In this paper we present several numerical tests on reaction-diffusion equations in the space of Turing, under the Schnakenberg reaction mechanism. The objectivge is to obtain the patterns of each coefficient of expansion in chaos polynomials. The tests were performed on 2D unit square, to which random initial conditions and Neumann zero conditions on the boundary were imposed.The parameters that define the behavior of the equations, more specifically the diffusion and reactive parameters, are modeled as stochastic fields.Thus, the standard method of finite element with Newton-Raphson was combined with the spectral stochastic finite element method. The parameters of each equation are described by Karhunen-Loève expansion, while the unknown is represented by the expansion of the polynomials of chaos. The results show the versatility of the method to solve different physical problems. Furthermore, it achieves statistical description of the solution. The results for the unknown stochastic coefficients, show complex patterns that mix bands and points which can not be predicted from the dynamics of the system
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