World Academy of Science, Engineering and Technology
International Journal of Bioengineering and Life Sciences
Vol:11, No:07, 2017

Turing Pattern in the Oregonator Revisited

Authors : Elragig Aiman, Dreiwi Hanan, Townley Stuart, Elmabrook Idriss

Abstract : In this paper, we reconsider the analysis of the Oregonator model. We highlight an error in this analysis which leads to an incorrect depiction of the parameter region in which diffusion driven instability is possible. We believe that the cause of the oversight is the complexity of stability analyses based on eigenvalues and the dependence on parameters of matrix minors appearing in stability calculations. We regenerate the parameter space where Turing patterns can be seen, and we use the common Lyapunov function (CLF) approach, which is numerically reliable, to further confirm the dependence of the results on diffusion coefficients intensities.

Keywords : diffusion driven instability, common Lyapunov function (CLF), turing pattern, positive-definite matrix
Conference Title : ICMCTB 2017 : International Conference on Mathematical, Computational and Theoretical Biology
Conference Location : Paris, France
Conference Dates : July 20-21, 2017