



The Hong Kong Polytechnic University Department of Applied Mathematics

Seminar

A new perspective on infection forces with demonstration by a DDE infectious disease model

By

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Abstract

In this talk, we will revisit the notion of infection force from a new angle which can offer a new perspective to motivate and justify some infection force functions. Our approach not only can explain many existing infection force functions in the literature, it can also motivate new forms of infection force functions, particularly infection forces depending on disease surveillance of the past. As a demonstration, we propose an SIRS model with delay. We comprehensively investigate the disease dynamics represented by this model, particularly focusing on the local bifurcation caused by the delay and another parameter that reflects the weight of the past epidemics in the infection force. We confirm Hopf bifurcations both theoretically and numerically. The results show that depending on how recent the disease surveillance data are, their assigned weight may have a different impact on disease control measures.

Biography

Prof. Xingfu Zou is currently a professor in the Dept of Applied Mathematics, University of Western Ontario, Canada. His research interests include Applied dynamical systems (ODEs, FDEs, PDEs) and biomathematics. He is currently serving as an editorial board member in several leading journals, such as Journal of Mathematical Biology, Mathematics in Applied Sciences and Engineering, Mathematical Biosciences and Engineering, Applicable Analysis and so on.

Date: 24 November 2023 (Friday) Time: 10:00-11:00 (Hong Kong Standard Time GMT +8) Venue: R601 Speaker: Prof. Xingfu Zou, University of Western Ontario Host: Dr. Yijun Lou, The Hong Kong Polytechnic University