Abstract

In this talk, we discuss a new SIS model with delay on complex heterogeneous networks. We calculate the epidemic threshold by using a Lyapunov functional and some analytical methods. We show some results about the stability of equilibria through the theory of functional differential equations: The disease-free equilibrium of the model is globally asymptotically stable if the effective spreading rate is below the epidemic threshold; while when the infection rate is above the epidemic threshold, the model admits a unique endemic equilibrium, which is globally asymptotically stable. Moreover, numerical simulation shows that the delay can affect the transmitting speed at which the disease reach the equilibria. This implies that the new model is more appropriate for studying real epidemic disease than the ones without delays when a disease has an incubation period.

About the Speaker

Prof. Xinchu Fu received the B.S. degree in Pure Mathematics from Wuhan University, Wuhan, China in 1982, the M.Sc. degree in Applied Mathematics from Wuhan Institute of Mathematical Sciences, Wuhan, China in 1985, and the PhD degree in Applied Mathematics from University of Exeter, England, UK in 2001. Currently he is a Professor of Applied Mathematics in the Department of Mathematics, Shanghai University, China. He is the Leader of the Shanghai University Leading Academic Discipline Project "Complex Systems: Theory, Methods and Technology" (2012-2014), and the Director of the Applied Mathematics Institute.

Prof. Fu is interested in the theory, methods and applications of Dynamical Systems and Complex Dynamical Networks. In these fields, he has (co)authored 3 research monographs and 1 edited volume, more than 100 SCI journal papers, and about 80 refereed conference papers/abstracts.

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