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Oscillations in delay differential equation models for vector-borne diseases

Vector-borne diseases are typical infectious diseases which can cause severe illness in humans or animals. Vectors like mosquitoes or ticks play a critical role in the transmission and spread of the diseases. To investigate the role of vectors, we formulate a system of delay differential equations to model the transmission dynamics of the diseases between vectors and their hosts. Analytical analyses show that vectors alone can force the system to oscillate. In addition, the interaction between vector and amplification host can also cause oscillations. A case study of WNV will be presented.

This is a joint work with Huaiping Zhu.