
TING-HAO HSU, University of Miami
Slow-Fast Systems and Regime Shifts

In ecology, regime shifts are continual rapid change between different long-lasting dynamics. An example is disease outbreak, where a system exhibits qualitative changes after long periods of apparent quiescence. Another example is rapid eco-evolutionary dynamics, which have been observed widely both in predators and in prey. For systems modeling those examples, we derive conditions under which regime shifts occur. Our approach was based on extending the so-called entry-exit function to multi-dimensional slow-fast systems using geometric singular perturbation theory. This is joint work with Shigui Ruan and Gail Wolkowicz.