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Jia Li* (li@math.uah.edu), Department of Mathematical Sciences, University of Alabama in Huntsville, Huntsville, AL 35899. *Simple Malaria Transmission Models with Stage-Structured Mosquito Populations and Backward Bifurcation.*

In this talk, we start with a simple SEIR model for malaria transmission dynamics, based on a system of ordinary differential equations. We derive a formula for the reproductive number by stability analysis of the infection-free equilibrium, and then investigate the existence of endemic equilibria. We show that, using the reproductive number as a bifurcation parameter, this simple model can have a backward bifurcation. We then introduce a simple two-stage-structured mosquito population model where we divide the mosquito population into two classes. After brief investigation on this simple stage-structured mosquito model, we incorporate it into the simple SEIR malaria model. We present basic analysis for the combined model and discuss how this combined model can help us study the impact of climate change on the transmission of malaria and other mosquito-borne diseases. (Received July 31, 2008)