1086-92-1387 **Yingyun Shen*** (yshen@math.fsu.edu), FSU Mathematics, 208 Love Building, 1017 Academic Way, Tallahassee, FL 32306, and **Mike Mesterton-Gibbons**. *Use of Lifespan-Shortening Wolbachia to Control Dengue Fever: Demographic Factors.*

Dengue fever is currently a serious arthropod-borne disease, affecting around 50 million people worldwide every year. There is no vaccine, and none of the current prevention methods can effectively reduce its transmission.

Dengue fever requires a relatively long extrinsic incubation period in its mosquito vector *Aedes aegypti* before transmission to a new human host, so the life expectation of infectious vectors strongly influences the spread of the disease. The bacterium *Wolbachia* greatly shortens the lifespan of *A. aegypti*. My current research focuses on a new SEIR model that explores the effect of *Wolbachia* on humans, using numerical solutions to investigate demographic factors that influence basic reproductive number and equilibrium prevalence. The persistence of the dengue fever sensitively depends on the mosquito survival profile. We studied the relationship among the number of *Wolbachia*-infected mosquitoes, the mosquito mortality rate, and the number of infectious humans at equilibrium. We found that the disease can be eliminated under certain circumstances. A stochastic model for transmission of dengue fever is also built to explore the above demographic factors. (Received September 25, 2012)