1106-34-151   **Ling Xue*** (`lxue2@tulane.edu`), Department of Mathematics, 6823 St Charles Ave, New Orleans, LA 70118, and **Carrie Manore**, **Panpim Thongsripong**, **Soodeh Azizi** and **Mac Hyman**. *Two-Sex Mosquito Model for the Spread of Wolbachia.* Preliminary report.

Wolbachia are maternally transmitted endosymbiotic bacteria that have the potential of reducing the ability of mosquitoes to transmit Dengue. To understand how *Wolbachia* can invade and sustain in mosquito populations, we developed an ordinary differential equation compartmental model. The model incorporates aquatic stage, female, and male adult mosquitoes taking into account fitness change and cytoplasmic incompatibility. Increasing the number of initial infections at endemic equilibrium leads to complete infection equilibrium and decreasing the number of initial infections at endemic equilibrium leads to disease free equilibrium, resulting in an interesting backward bifurcation. The thresholds for the number of *Wolbachia* infected mosquitoes needed to be released to establish *Wolbachia* in mosquitoes after implementing mosquito control strategies were compared. Killing uninfected female mosquitoes frequently requires the least number of *Wolbachia*-infected mosquitoes for *Wolbachia* to establish in mosquito population. Mathematical analysis and numerical simulation results help us understand factors that determine invasion and establishment of *Wolbachia* in mosquito populations. (Received July 29, 2014)