1161-49-105 **Liming Cai**, **Lanjing Bao**, **Logan Rose**, **Jeffery Summers** and **Wandi Ding***, 1301 E. Main Street, MTSU Box 34, Murfreesboro, TN 37132. *Mathematical Modeling and Optimal Control for Malaria Transmission Using Sterile Insect Technique (SIT) and Insecticide-Treated Nets (ITN).*

We consider a malaria transmission model with SEIR (susceptible-exposed-infected-recovered) classes for the human population, SEI (susceptible-exposed-infected) classes for the wild mosquitoes and an additional class for sterile mosquitoes. We derive the basic reproduction number of infection. We formulate an optimal control problem in which the goal is to minimize both the infected human populations and the cost to implement two control strategies: the release of sterile mosquitoes and the usage of insecticide-treated nets to reduce the malaria transmission. Adjoint equations are derived and the characterization of the optimal controls is established. Finally, we quantify the effectiveness of the two interventions aimed at limiting the spread of Malaria. A combination of both strategies leads to a more rapid elimination of the wild mosquito population that can suppress Malaria transmission. Numerical simulations are provided to illustrate the results. (Received August 13, 2020)