1154-92-2142 **Leah Mitchell*** (lmmitchell@wpi.edu) and **Andrea Arnold** (anarnold@wpi.edu). *Analyzing the Effects of Observation functions in Nonlinear filtering for the SIR model.*

Nonlinear filtering is an approach to solving the inverse problem of estimating unknown states and/or parameters of a system. The ensemble Kalman filter (EnKF) is one such algorithm that can be used for nonlinear, non-Gaussian systems within a Bayesian inference framework. One component of the EnKF is the observation function, which relates the discrete, noisy data back to the system model. The observation function can take different forms based on assumptions relating to the available data and relevant system parameters. The goal of this research is to explore the effects of selecting different observation functions in the EnKF framework, for both parameter and state predictions in epidemic models. In particular, four different observation functions, of different forms and various levels of complexity, are examined in the SIR model. Results discuss the effects of the observation function selection on the filter outputs. (Received September 17, 2019)