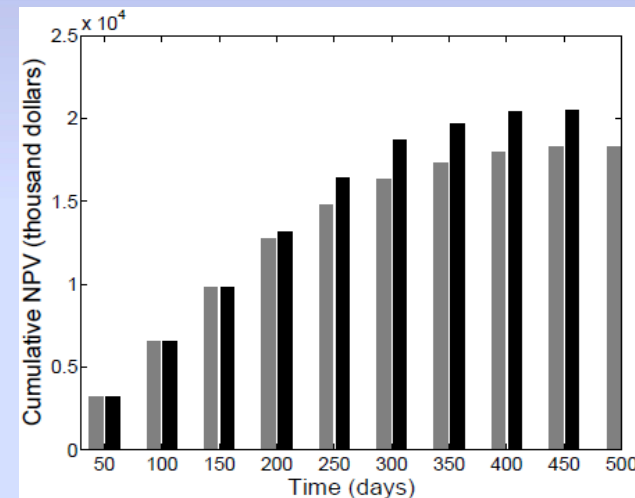
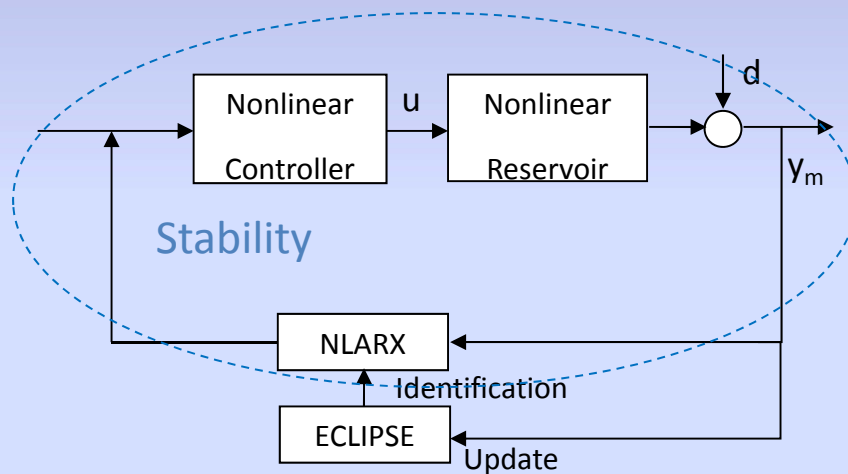


Reservoir Uncertain Parameter Updating and Closed-loop Stability Analysis

Karlene Hoo, Department of Chemical Engineering, Texas Tech University. PRF# 49545-ND9

Uncertain Parameter Updating: One of our objectives is to update the sensitive parameters which affect the performance of the system. A Markov chain Monte Carlo method is applied to carry out the updating. Updating is embedded in the closed-loop optimal management framework whose objective is to optimize the net present value.



Closed-loop Nonlinear Stability Analysis: Stability of a nonlinear model in a closed-loop system was established using the circle criterion and a suitable Lyapunov function. The model identified belongs to the class of nonlinear autoregressive with exogenous inputs models (NLARX). The NLARX models satisfies the circle criterion and certain assumptions therefore, the nonlinear closed-loop system represented by the NLARX model is globally exponentially stable.