

Texas Tech University. Applied Mathematics Seminar.

State and Parameter Estimation for Chemical Process Operations

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ABSTRACT. State estimation is an important problem in chemical process operations. For linear dynamical systems, Kalman Filter (KF) results in optimal estimates. Chemical engineering problems are characterized by nonlinear models and constraints on the states. Nonlinearities in these models are handled effectively by the Extended Kalman Filter (EKF), whereas constraints pose more serious problems. Several constrained estimation problems where the EKF approach fails have been reported in the literature. In this talk approaches that use two ideas - receding horizon and unscented transformation - in state estimation will be discussed. Examples that demonstrate the importance of these ideas in chemical engineering state estimation problems will be presented.