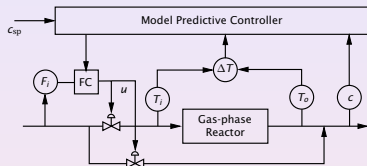


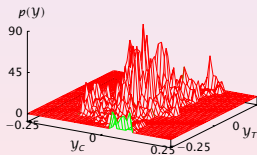
Improved Chemical Process Operations through Data-Based Disturbance Models

Eastman gas-phase reactor control system

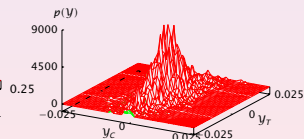


- $x^+ = Ax + Bu + Gw$ $y = Cx + v$
 $w \sim N(0, Q)$ $v \sim N(0, R)$
- Identify the minimum number of disturbances from data
- Minimum variance estimate of G
- Convex semidefinite optimization
- Impose positive definite constraints on variances Q, R

- Implemented on data from Eastman (above and right) and ExxonMobil
- Extending to nonlinear models
- Using with other state estimation methods (particle filtering)



Using original covariances



Using ALS covariances