

**Meeting:** 1006, Lubbock, Texas, SS 11A, Special Session on Future Directions in Mathematical Systems and Control Theory

1006-93-50            **Zhenhua Tian\*** (zhenhua.tian@ttu.edu), Dept. Chemical Engineering, MS 3121, Lubbock, TX 79409-3121, and **Karlene A Hoo** (khoo@coe.ttu.edu), Dept. Chemical Engineering, Mail Stop 3121, Lubbock, TX 79409-3121. *State-Shared Model for Multiple-Input Multiple-Output Systems.*

This work proposes a method to construct a state-shared model for multiple-input multiple-output (MIMO) systems. A state-shared model is defined as a linear time invariant state-space structure that is driven by measurement signals - the plant outputs and the manipulated variables, but shared by different multiple input/output models. The genesis of the state-shared model is based on a particular reduced non-minimal realization. Any such realization necessarily fulfills the requirement that the output of the state-shared model be an asymptotically correct estimate of the output of the plant, if the process model was selected appropriately. The approach is demonstrated on a nonlinear MIMO system. (Received January 28, 2005)