1068-93-89 **Qing Zheng*** (zheng003@gannon.edu), Gannon University, PMB 3236, 109 University Square, Erie, PA 16541. *An Active Disturbance Rejection Based Dynamic Decoupling Control Approach.*

In this paper, a unique dynamic decoupling control strategy, based on the active disturbance rejection control framework, is proposed for square multivariable systems. With the proposed method, it is shown that a largely unknown square multivariable system is readily decoupled by actively estimating and rejecting the effects of both the internal plant dynamics and external disturbances. By requiring as little information on plant model as possible, the intention is to make the new method practical. The stability analysis shows that both the estimation error and the closed-loop tracking error are bounded and the error upper bounds monotonously decrease with the bandwidths. Simulation results obtained on chemical process problems and micro-electro-mechanical systems show excellent performance in the presence of significant unknown disturbances and unmodeled dynamics. (Received January 14, 2011)