1125-37-136 **Nirja Dave***, Department of Mathematics, 301 Thackeray Hall, University of Pittsburgh, Pittsburgh, PA 15260, and **Andre Lesartre**, Dept. of Applied Mathematics & Statistics, Colorado School of Mines, Golden, CO 80401. *Control of Cardiac Tissue Using Feedback-Based Synchronization.*

Cardiac arrhythmias are a type of heart disease caused by the irregular propagation of electrical signals in the heart. The resultant waves can have complex patterns including one or more spiral waves. We assess the effectiveness of synchronization to control complex spiral-wave dynamics in two-dimensional cardiac tissue using three different reaction-diffusion models, each consisting of a voltage variable and a recovery variable. Our approach involves synchronizing two unidirectionally coupled systems by applying a feedback term that is proportional to the difference in the voltage variable averaged locally over uniformly spaced sensors to one of the systems, with the quality of synchronization measured in the voltage. Our study extends previous work by Berg et al. through the use of additional cardiac-specific models, a time-discrete feedback term, different initial conditions for the response system, and different model parameters for the driver and response systems. We vary model and synchronization parameters to determine the range of conditions for which synchronization is possible. Our findings show that synchronization in the recovery variable is key to synchronization success in the voltage variable. (Received August 03, 2016)