1065-92-143 **Frederic Mazenc**, Projet INRIA DISCO, CNRS-Supelec, 3 rue Joliot Curie, 91192 Gif-sur-Yvette, France, **Michael Malisoff*** (malisoff@lsu.edu), Department of Mathematics, 303 Lockett Hall, Louisiana State University, Baton Rouge, LA 70803-4918, and **Marcio de Queiroz**, Department of Mechanical Engineering, Louisiana State University, Baton Rouge, LA 70803-6413. *Tracking Control and Robustness Analysis for a Nonlinear Model of Human Heart Rate During Exercise.*

The control of human heart rate during exercise is an important problem that has implications for the development of protocols for athletics, assessing physical fitness, weight management, and preventing heart failure. We provide a new stabilization technique for a recently-proposed nonlinear model for human heart rate response that describes the central and peripheral local responses during and after treadmill exercise. The control input is the treadmill speed, and the objective is to make the heart rate and peripheral responses track a prescribed reference trajectory. We use a strict Lyapunov function analysis to design new state and output feedback tracking controllers that globally exponentially stabilize the tracking dynamics to zero and ensure input-to-state stable performance with respect to actuator errors. (Received September 14, 2010)