Frederic Mazenc (Frederic.Mazenc@[omit]supagro.inra.fr), Projet MERE INRIA-INRA, UMR Analyse des Systèmes et Biométrie INRA, 2 pl. Viala, 34060 Montpellier, France; **Michael Malisoff*** (malisoff@[omit]lsu.edu), Department of Mathematics, Louisiana State University, Baton Rouge, LA 70803; and **Marcio de Queiroz** (dequeiroz@[omit]me.lsu.edu), Department of Mechanical Engineering, Louisiana State University, Baton Rouge, LA 70803-6413, *On Strict Lyapunov Functions for Rapidly and Slowly Time-Varying Nonlinear Systems.*[1]

Abstract. We explicitly construct Lyapunov functions for rapidly time-varying nonlinear systems. The Lyapunov functions we construct are expressed in terms of oftentimes more readily available Lyapunov functions for the limiting dynamics which we assume are globally asymptotically stable. This leads to new sufficient conditions for global exponential, global asymptotic, and input-to-state stability of fast time-varying dynamics. We apply our results to a mass-spring dynamics. This talk is based on [Mazenc, F., M. Malisoff, and M. de Queiroz, "Further results on strict Lyapunov functions for rapidly time-varying nonlinear systems," *Automatica*, Volume 42, Issue 10, October 2006, pp. 1663-1671.] which is available from http://www.math.lsu.edu/∼malisoff/research.html. Time permitting, we will also discuss some analogous results for slowly time-varying systems from [Mazenc, F., and M. Malisoff, "Further results on Lyapunov functions for slowly time-varying systems," *Mathematics of Control, Signals, and Systems*, Volume 19, Number 1, February 2007, pp. 1-21.].

Biographical Sketch. Michael Malisoff was born in the City of New York and received his B.S. degree summa cum laude (Phi Beta Kappa) in Economics and Mathematical Sciences from the State University of New York at Binghamton. He received the first place Student Best Paper Award plaque from the 38th IEEE Conference on Decision and Control in 1999. He earned his Ph.D. in Mathematics from Rutgers University in 2000 under the direction of Hector Sussmann. Since 2001, he has been an Assistant Professor and Associate Member of the Graduate Faculty in the Department of Mathematics at Louisiana State University in Baton Rouge. Together with Marcio de Queiroz and Peter Wolenski, he jointly organized the Louisiana Conference on Mathematical Control Theory (MCT'03) whose edited proceedings have been published in the Springer volume *Optimal Control, Stabilization, and Nonsmooth Analysis.* He has been the sole principal investigator on research grants from the Louisiana Board of Regents, the National Academy of Sciences, and the NSF including a 3-year NSF Mathematical Sciences Priority Area award. He has more than 40 technical publications in the areas of Lyapunov function theory, feedback stabilization, Hamilton-Jacobi equations, and optimal control.

[1]The [omit] should be omitted when sending email. It was included here to avoid automatic "harvesting" by spam-list makers. This material is based upon work supported by the National Science Foundation under Grant No. 0424011. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.