1014-70-1775 **Jason M. Osborne*** (jmosborn@unity.ncsu.edu), Department of Mathematics, North Carolina State University, 255 Harrelson Hall, Raleigh, NC 27695. *Geometric Control of the Chaplygin Sleigh and Double Gimbal System.*

We consider two problems in the non-linear geometric control of mechanical systems; the moving mass Chaplygin sleigh and the double gimbal system. We show that using a moving center of mass one can steer an already moving sleigh in any direction. The control law is based upon the uncontrolled dynamics/modes of the system in that the controlled dynamics are used to initiate short-time transfers between these basic modes. Hence, the controller remains unpowered for most of the steering procedure. We also present some preliminary results on a geodesic based control law for the double gimbal system. (Received October 04, 2005)