

Meeting: 1004, Bowling Green, Kentucky, SS 13A, Special Session on Nonlinear Analysis and Applied Mathematics

1004-35-21 **Ciprian Foias**, Department of Mathematics, Mailstop 3368, Texas A&M University, College Station, TX 77843-3368, **Luan Hoang*** (lhoang@math.tamu.edu), Department of Mathematics, Mailstop 3368, Texas A&M University, College Station, TX 77843-3368, **Eric Olson** (ejolson@unr.edu), Department of Mathematics, University of Nevada, Reno, NV 89503, and **Mohammed Ziane** (ziane@math.usc.edu), USC Department of Mathematics, Kaprielian Hall, Room 108, 3620 Vermont Avenue, Los Angeles, CA 90089-253. *On the Solutions to the Normal Form of the Navier-Stokes Equations.*

We introduce a construction of regular solutions to the Navier-Stokes equations which is specifically designed for the study of the asymptotic expansions of the solutions. Using this construction, we give sufficient conditions for the convergence of those expansions. We also construct suitable normed spaces in which they actually converge. Moreover in these spaces, the normal form of the Navier-Stokes equations associated with the asymptotic expansions is a well-behaved infinite system of differential equations. (Received December 17, 2004)