

1024-35-25

Foias Ciprian and **Luan Thach Hoang*** (lthoang@math.umn.edu), 127 Vincent Hall, 206 Church St. S.E., Minneapolis, MN 55455, and **Eric Olson** and **Mohammed Ziane**. *Studying the normal form of the Navier-Stokes equations in suitable Banach spaces*. Preliminary report.

This is the continuation of our previous work (Indiana Univ. Math. Journal, Vol. 55, No 2 (2006) 631-686). We consider solutions to the incompressible Navier–Stokes equations on the periodic domain $\Omega = [0, 2\pi]^3$ with potential body forces. Let $\mathcal{R} \subseteq H^1(\Omega)^3$ denote the set of all initial data that lead to regular solutions. Our main result is to construct a suitable Banach space S_A^* such that the normalization map $W : \mathcal{R} \rightarrow S_A^*$ is continuous, and such that the normal form of the Navier–Stokes equations is a well-posed system in all of S_A^* . We also show that S_A^* may be seen as a subset of a larger Banach space V^* and that the extended Navier–Stokes equations, which are known to have global solutions, are well-posed in V^* . (Received November 21, 2006)