

Derivation of the Lagrangian Averaged Navier-Stokes equation and local existence with small initial data

Nathan Pennington

Abstract

We will discuss the derivation of the Lagrangian Averaged Navier Stokes equation and show the existence of a short time solution u to the LANS equation $\partial_t u + (u \cdot \nabla)u + \operatorname{div} \tau^\alpha = -\operatorname{grad} p + \nu \Delta u$ with initial data $u(0) = u_0$ in the Sobolev space $H^{s,p}(\mathbb{R}^m)$ for small $s > 0$.