Local and global existence for the Lagrangian Averaged Navier-Stokes equations in Besov spaces

Nathan Pennington
Kansas State University

Abstract: Through the use of a non-standard Leibntiz rule estimate, we prove the existence of unique local and global solutions to the incompressible isotropic Lagrangian Averaged Navier-Stokes equation with initial data in the Besov space various categories of Besov spaces. Specifically, for $p > n$, we get local existence with initial data $u_0 \in B_{p,q}^r(R^n)$ for $r > 0$. For $p = 2$, we get local existence with initial data $u_0 \in B_{2,q}^{n/2-1}(R^n)$ and the local solution can be extended to a global solution for $n = 3, 4$.