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The generalized incompressible Navier-Stokes equations in Besov spaces. (English)

Zbl 1075.35043
Dyn. Partial Differ. Equ. 1, No. 4, 381-400 (2004).

The following Cauchy problem is considered:

$$\frac{\partial v}{\partial t} + (v \cdot \nabla)v + \nu(-\Delta)^{\alpha} v + \nabla p = 0, \quad \operatorname{div} v = 0, \quad x \in \mathbb{R}^n,\ t > 0$$
$$v(x,0) = v_0(x), \quad x \in \mathbb{R}^n.$$

Here ν and α are given positive constants. The case $0 < \alpha < \frac{1}{2} + \frac{n}{2}$ is studied in the paper. It is proved that if $\|v_0\|_B \le C_0\,\nu$ for some suitable constant C_0 then the Cauchy problem has a unique global solution in Besov spaces. $\|\cdot\|_B$ denotes the norm in a certain Besov space.

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MSC:

35Q30 Navier-Stokes equations
76D03 Existence, uniqueness, and regularity theory for incompressible viscous fluids

Keywords:

global solutions; Besov spaces; existence; uniqueness; Cauchy problem

Full Text: DOI