Neustupa, Jiří

A note on local interior regularity of a suitable weak solution to the Navier-Stokes problem.

(English) Zbl 1260.35125
Discrete Contin. Dyn. Syst., Ser. S 6, No. 5, 1391-1400 (2013).

Summary: We formulate a criterion which guarantees a local regularity of a suitable weak solution v to the Navier-Stokes equations (in the sense of *L. Caffarelli, R. Kohn* and *L. Nirenberg* [Commun. Pure Appl. Math. 35, 771–831 (1982; Zbl 0509.35067)]). The criterion shows that if (x_0, t_0) is a singular point of solution v then the L^3-norm of v concentrates in an amount greater than or equal to some $\epsilon > 0$ in an arbitrarily small neighbourhood of x_0 at all times t in some left neighbourhood of t_0. As a partial result, we prove that a localized solution satisfies the strong energy inequality.

MSC:

35Q30	Navier-Stokes equations
76D03	Existence, uniqueness, and regularity theory for incompressible viscous fluids
76D05	Navier-Stokes equations for incompressible viscous fluids

Keywords:

Navier-Stokes equations; suitable weak solution; regularity

Full Text: DOI