タイトル TITLE	Diffusive Lagrangian Transformations		
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We will discuss a representation ([1]) of solutions of incompressible Navier-Stokes equations in terms of a diffusive Lagrangian transformation

$$x \mapsto A(x,t).$$

The transformation is close to the identity for short times, and the solution is built as a product expansion. The same approach works for regularizations of the Navier-Stokes equations ([2]) and has as singular limit an ideal fluid representation ([3]). We will present bounds of the type

$$\|\nabla (A - \mathbf{I})\|_{\{A,\lambda,1\}} \le \epsilon$$

for the analytic norm

$$\|A - \mathbf{I}\|_{\{A,\lambda,1\}} = \int e^{\lambda|\xi|}|\widehat{(A - \mathbf{I})}(\xi)|d\xi$$

of the map. The bounds are valid on short intervals of time $t \in [t_k, t_k + \tau_\epsilon]$ where τ_ϵ and λ are controlled by the enstrophy, and t_k are resetting times, $A(x, t_k) = x$. Here ϵ is a small prescribed number, and τ_ϵ is proportional to it. We describe future directions of work, including the application of this approach to subgrid modelling ([4]).

参考文献

[1] P. Constantin, An Eulerian-Lagrangian approach for the Navier-Stokes equations, Commun. Math. Phys **216** (2001), 663-686.

[2] P. Constantin, Filtered Viscous Fluid Equations, Computer and Mathematics with Applications, to appear (2001).

[3] P. Constantin, An Eulerian-Lagrangian approach for incompressible fluids: Local theory, J. Amer. Math. Soc. 14 (2001), 263-278.

[4] P. Constantin, C. Foias, E. Titi, (in preparation).