Logarithmically Improved Extension Criteria Involving the Pressure for the Navier-Stokes Equations in $\mathbb{R}^3$

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Abstract

In the talk, several new extension criteria involving the pressure for the non-stationary 3D Navier-Stokes equations are presented. We shall show that, for example, if a strong solution u on $[0,T)$ and the pressure π associated with u satisfy the condition

$$\int_0^T \frac{\|\pi(\tau)\|_{\dot{B}^{-3/p}_{\infty,\infty}}^r}{\log(e+\|u(\tau)\|_{H^s})} d\tau < \infty \quad \text{for } \frac{2}{r}+\frac{3}{p}=2 \text{ with } 3 \le p \le \infty,$$

then there is $T' > T$ such that u can be continued to the strong solution on $[0,T')$. Our method of the proof is based on the interpolation inequality in Besov spaces due to Gérard-Meyer-Oru [1]. This is a joint work with Dr. Ryo Kanamaru.

References

[1] P. Gérard, Y. Meyer, and F. Oru, *Inégalités de Sobolev précisées*, Séminaire sur les Équations aux Dérivées Partielles, 1996–1997, École Polytech., Palaiseau, 1997, pp. Exp. No. IV, 11.

[2] R. Kanamaru and T. Yamamoto, *Logarithmically Improved Extension Criteria Involving the Pressure for the Navier-Stokes Equations in* $\mathbb{R}^n$, Math. Nachr., (in press).