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Global solution for the incompressible Navier-Stokes equations with a class of large data in $\text{BMO}^{-1}(\mathbb{R}^3)$. (Chinese. English summary) Zbl 07494959

Summary: In this paper, we establish the global well-posedness, and the space-time analyticity of the Navier-Stokes equations for a class of large periodic data $u_0 \in \text{BMO}^{-1}(\mathbb{R}^3)$. We not only establish the global nonlinear stability of Beltrami flow in $\text{BMO}^{-1}(\mathbb{R}^3)$, but more importantly, we prove the global existence and nonlinear stability for a class of initial data consisting large sums of finitely many Beltrami flows. This improves the classical result of a previous paper for the global well-posedness with small initial data $u_0 \in \text{BMO}^{-1}(\mathbb{R}^3)$.

MSC:
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global regularity; Navier-Stokes equations; large data; Koch-Tataru solution

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