Abstract

In this paper, we establish a Serrin-type regularity criterion in terms of the pressure for Leray weak solutions to the Navier–Stokes equation in $\mathbb{R}^3$. It is proved that the solution is regular if the associate pressure satisfies

$$p \in L^{\frac{2}{2-r}}((0, T); \dot{M}_{2,r}^2(\mathbb{R}^3)) \quad \text{or} \quad \nabla p \in L^{\frac{2}{2-r}}((0, T); \dot{M}_{2,r}^2(\mathbb{R}^3))$$

for $0 < r < 1$, where $\dot{M}_{2,r}^2(\mathbb{R}^3)$ is the critical Morrey–Campanto space. Regularity criteria for the 3D MHD equations are also given.