

## The regularity criterion of Leray weak solutions to the Navier-Stokes equations

**Abstract:** In this paper we obtain sufficient conditions for the regularity of Leray solutions of Navier-Stokes equations (NSE) in three dimensional space. We prove that if  $\frac{\partial u}{\partial x_3} \in L^p(0, T; L^q(\mathbb{R}^3))$ ,  $\frac{2}{p} + \frac{3}{q} \leq 2$ ,  $3 \leq q \leq 6$  and  $\frac{\partial u}{\partial x_3} \in L^p(0, T; L^q(\mathbb{R}^3))$ ,  $\frac{2}{p} + \frac{3}{q} \leq \frac{11}{6} + \frac{1}{q}$ ,  $q > 6$  then the solution is regular.