1086-35-1740   **Tao Huang***, Department of Mathematics, Lexington, KY 40506, and **Changyou Wang**.
Regularity and uniqueness for a class of solutions to the hydrodynamic flow of nematic liquid crystals.

We establish an ϵ-regularity criterion for any weak solution (u, d) to the nematic liquid crystal flow such that $(u, \nabla d) \in L_t^p L_x^q$ for some $p \geq 2$ and $q \geq n$ satisfying the condition $\frac{n}{q} + \frac{2}{p} = 1$. As consequences, we prove the interior smoothness of any such a solution when $p > 2$ and $q > n$. We also show that uniqueness holds for the class of weak solutions (u, d) the Cauchy problem of the nematic liquid crystal flow that satisfy $(u, \nabla d) \in L_t^p L_x^q$ for some $p > 2$ and $q > n$ satisfying $\frac{n}{q} + \frac{2}{p} = 1$. (Received September 24, 2012)