Partial Differential Equations Seminar

Title Existence of weak solutions the equations of a non-Newtonian fluid with non standard growth

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Abstract

We consider the equations of a non-Newtonian incompressible fluid in a general time space cylinder $Q_{T}= \Omega \times (0,T) \subset \R^{n} \times \R, n \ge 2$. We assume that the rheology of the fluid is changing with respect to time and space and satisfies for each $(x,t) \in Q_{T}$ the associated power law $|D|^{p(x,t)} D$. Under the assumption that $\frac{2n}{n+2} < p_{0} \le p(x,t) \le p_{1} < +\infty$ and the set of discontinuity of p is closed and of measure zero we show the existence of a weak solution to the corresponding equations of PDEs for any given initial velocity in $L^{2}_{\sigma} (\Omega)$. Joint work with Prof. H-O. Bae (Ajou University, Suwon)

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