Partial Differential Equations and Applied Mathematics Seminar

Title Localization of Gronwall's Lemma with some applications to the Euler equations

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Abstract

•By the famous Beale-Kato-Majda condition and a result due to Kozono and Taniuchi it is well know that a smooth decaying solution \$v:\mathbb{R}^3 times (0, T_0) \rightarrow \mathbb{R}^3\$ to the Euler equations must blow up at some time \$T_0>0\$ if and only if \$\int_0^{T_0} \| \omega(t)\|_{BMO} dt = +\infty\$, where \$\omega\$ stands for the vorticity of \$v\$. By using a discretized local version of Gronwall's lemma we are able to provide a corresponding local blow up condition, which has some interesting application to axisymmetrc Euler flow and the Boussinesq equations as well.