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Alexey Cheskidov* (acheskid@math.uic.edu), University of Illinois at Chicago, 322 Science and Engineering Offices, 851 S. Morgan Street, Chicago, IL 60607. *On the maximal enstrophy growth rate for solutions to the 3D Navier-Stokes equations.*

Due to a supercritical nature of the 3D Navier-Stokes equations, the best known estimates on the enstrophy growth rate do not rule out the existence of finite time singularities. Recently Doering and Lu numerically showed that these estimates are sharp. In this talk I will present some analytical results in this direction as well as related regularity criteria in critical spaces. (Received February 04, 2009)