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On the exterior problem in 2D for stationary flows of fluids with shear dependent viscosity

Comment.Math.Univ.Carolin. 53,2 (2012) 221 –236.

Abstract: On the complement of the unit disk B we consider solutions of the equations describing the stationary flow of an incompressible fluid with shear dependent viscosity. We show that the velocity field u is equal to zero provided $u|_{\partial B} = 0$ and $\lim_{|x|\to\infty} |x|^{1/3}|u(x)| = 0$ uniformly. For slow flows the latter condition can be replaced by $\lim_{|x|\to\infty} |u(x)| = 0$ uniformly. In particular, these results hold for the classical Navier-Stokes case.

Keywords: equations of Navier-Stokes type, stationary case, exterior problem in 2D
AMS Subject Classification: 76D05, 35Q30

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