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Title: Robust error bounds for finite-element methods applied to the Navier-Stokes equations

Abstract: It is well-known that the Navier-Stokes equations model the velocity of incompressible fluids. As opposed to heat transfer phenomena or elasticity, standard finite-element methods produce very poor results when applied to the Navier-Stokes equations in the presence of high Reynolds number. The Reynolds number is a dimensionless parameter obtained as the ratio between inertia and viscous forces, and in most phenomena of practical interest its value is very large. Numerous techniques have been developed since long ago to improve the performance of finite-element methods at high Reynolds number. However, only recently its analysis has been attempted, showing that with these techniques it is possible to obtain error bounds whose constant do not depend on the Reynolds number, known as robust error bounds. In this talk, we review recent advances in this subject.

Joint work with Julia Novo (Universidad Autónoma de Madrid)