A numerical comparison of LPS, EDS and GLS for instationary flows

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Appending stabilizing terms to the finite element discretization of the Navier-Stokes equations leads to artificial diffusion. The amount of the artificial diffusion, which is added by this stabilization techniques, is compared for a driven cavity test case. Starting with a initial stationary solution for Reynolds number Re=500, the boundary conditions are set to zero and the Reynolds number is increased to Re=20.000. Then the loss of kinetic energy is observed for various mesh sizes for the different stabilizing terms. To ensure the accuracy of the solutions the charactistics of the friction on the lower bound is compared.