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Stationary Navier-Stokes equations with critically singular external forces: existence and stability results

Abstract. We show the unique existence of solutions to stationary Navier-Stokes equations with small singular external forces belonging to a critical space. To the best of our knowledge, this is the largest critical space that is available up to now for this kind of existence. This result can be viewed as the stationary counterpart of the existence result obtained by H. Koch and D. Tataru for the free non-stationary Navier-Stokes equations with initial data in BMO^{-1}. The stability of the stationary solutions in such spaces is also obtained by a series of sharp estimates for resolvents of a singularly perturbed operator and the corresponding semigroup. This talk is based on joint work with Tuoc Van Phan.
