

The Navier-Stokes equation in Morrey spaces and related function spaces

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Abstract

We deal with the Cauchy problem for the Navier-Stokes equation and semilinear heat equations on the whole Euclidean space, and construct large function spaces such that the above Cauchy problem admits one and only one time-global solution with small initial data in some of the above function spaces. As a result, we show that the above Cauchy problem has a time global solution with some distributions, which are not even Radon measures, as initial data. We also show the stability of small stationary solutions of the Navier-Stokes equation belonging to suitable Morrey spaces with perturbations belonging to the above function spaces.