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Title: Local and global analysis in Besov-Morrey spaces
for inhomogeneous Navier-Stokes equations

Abstract: In this work we consider the incompressible inhomogeneous Navier-Stokes equations in the whole space with dimension $n \geq 3$.

We present local and global well-posedness results in a new framework for inhomogeneous fluids, namely Besov-Morrey spaces that are Besov spaces based on Morrey ones. In comparison with the previous works in Sobolev and Besov spaces, our results provide a larger initial-data class for both the velocity and density, constructing a unique global-in-time flow under smallness conditions on weaker initial-data norms. From a technical viewpoint, since the Morrey norms prevent the common use of energy-type and integration by parts arguments, we need to obtain some estimates for the localizations of the heat semigroup, the commutator, and the volume-preserving map in our setting.