
Summary: In this article, we consider a small rigid body moving in a viscous fluid filling the whole \( \mathbb{R}^2 \). We assume that the diameter of the rigid body goes to 0, that the initial velocity has bounded energy and that the density of the rigid body goes to infinity. We prove that the rigid body has no influence on the limit equation by showing convergence of the solutions towards a solution of the Navier-Stokes equations in the full plane \( \mathbb{R}^2 \).

MSC:

35Q30 Navier-Stokes equations  
76D05 Navier-Stokes equations for incompressible viscous fluids  
76U05 General theory of rotating fluids  
74F10 Fluid-solid interactions (including aero- and hydro-elasticity, porosity, etc.)

Keywords: incompressible flow; Navier-Stokes equations; fluid-structure interaction; small obstacle; singular limit

Full Text: DOI arXiv

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